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FOREWARD

We hosted on 7-8 June 2023 the 18th edition of the Accounting and Management Information Systems International Conference at the Bucharest University of Economic Studies, Romania. It was a great pleasure to organize the first in person edition after the COVID19 pandemic, and to welcome to our university many colleagues from Romania and from abroad, to engage in very fruitful conversations about research and educational practices.

During the conference, we organized a key notre address and a plenary panel, animated by esteemed international colleagues from Australia, the United States, and the United Kingdom. Moreover, 3 additional panels were organized on topics of great interest for accounting academia and practice. 13 parallel sessions completed the program, for a total of 42 papers that were presented. From these, the authors of 20 papers submitted their paper for inclusion in the conference proceedings. 90 participants from 13 countries actively praticipated and contributed to the debates in either panels or sessions.

Preceding the AMIS 2023 conference, IAAER and the Association of Chartered Certified Accountants (ACCA) have co-organized, on 5-6 June 2023, another edition of their traditional Accounting Scholars Research Workshop. 15 young researchers from the Czech Republic, Romania, Poland, Turkey, Croatia and North Macedonia benefited from the presentations and feedback offered by 12 established faculty on how to improve their research work with a view to make it publishable by international journals.

In the end, I will also thank our team: Liliana Ionescu-Feleagă, Nadia Albu, Dana Boldeanu, Mădălina Dumitru, Raluca Guşe, Dragoş Mangiuc, Mirela Nichita, Maria Săndulescu. They have volunteered their time to this important and traditional event in Central and Eastern Europe.

We are very much looking forward to hosting everybody again at our university!

Professor Cătălin Albu
Conference Chair

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Sustainability in the Context of the Global Semiconductor Crisis: An Analysis of Companies' Performance

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Abstract: *The global semiconductor crisis triggered by the SARS-CoV-2 pandemic has resulted in a tumultuous period for the automotive and semiconductor industries. This paper presents an analysis of the sustainability initiatives and standards in the context of the semiconductor crisis and the influence of sustainable development on the performance of companies. To research sustainable development in the context of the global semiconductor crisis, a sample of 30 automobile manufacturing companies, respectively 83 semiconductor manufacturing companies from 2019 to 2021 was used, based on which two econometric models were founded. The results show that ESG controversies and ESG factors have a significant influence on the performance of companies in the two interconnected economic activities (automobile manufacturers and semiconductor manufacturers). Management Score and CSR Strategy Score have a negative and significant impact on the performance of automobile manufacturing companies.*

Keywords: *Sustainability, ESG controversies, ESG factors, semiconductor crisis, performance.*

1. Introduction

Sustainability reporting has become the trend of the 21st century (Siew, 2015), while standardization in sustainability reporting has been promoted more and more with the emergence of recent crises that affected different fields of activity. The most recent are the SARS-CoV-2 health crisis, the semiconductor crisis and the crisis triggered by the war in Russia and Ukraine (Alper, 2022). This trend has been seen in the investors' focus on economic performance as well as at the entities' voluntary initiative of preparing sustainability performance reports. For voluntary reporting, CSR regulations for managing businesses (Olanipekun *et al.*, 2021), GRI, IIRC, or ESG factors, were usually used as tools to determine an entity's impact on sustainability (Halkos and Nomikos, 2021). Once the pandemic raised the degree of awareness of the problems caused by climate changes and recent crises, mandatory reporting requirements appeared, such as CSRD-EU Directive 2022/2464. This was due to the concern that entities and industries affected by the pandemic could affect planetary survival (Adams and Abahayawansa, 2022).

The semiconductor crisis, known as chip shortage crisis, has been caused by the SARS-CoV-2 pandemic. This anomaly had a significant impact on businesses related to the semiconductor industry and the chip production ecosystem. Semiconductors play an

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important role in people’s lives, and this industry has grown exponentially in the last 30 years (Varas *et al.*, 2021). A lack of sustainability performance reported, has been observed in the automobile manufacturing industry (Perello-Marin, 2022). In the chip shortage crisis, semiconductor producing companies will have to report sustainability metrics. Bhat (2016) suggests that sustainability reporting will not contribute to cost savings, but energy savings, water conservation, and waste minimization could save costs. However, it is still questionable if reporting information about the non-performance of this industry would be helpful for prevention of crises.

This research analyzes the influence of sustainable development on the performance of companies through a comparative approach of two interconnected economic activities (automobile manufacturing and semiconductor manufacturing) in the context of the global semiconductor crisis triggered by the SARS-CoV-2 pandemic. Two research hypotheses were formulated: (H1) *The performance of automobile and semiconductor manufacturers companies is influenced by ESG controversies in a crisis context*, respectively, (H2) *ESG factors and the adoption of United Nations Global Compact principles influence the performance of companies in the context of the global semiconductor crisis*.

The second section of this paper presents a literature review of sustainability reporting standards and initiatives, a review of the ESG factors as sustainability reporting tools and the current state of semiconductor crisis, and the relationship with sustainability reporting. The third section presents the methodology, where sample data and variables used are presented, and the fourth section contains the results of the analysis. This study is a quantitative analysis performed using seven independent variables specific to the sustainable development of companies: ESG Controversies Score, Environmental Pillar Score, Social Pillar Score, Management Score, Shareholder Score, CSR Strategy Score and Global Compact Signatory aimed to observe the effects of the semiconductor crisis on automobile manufacturing and semiconductor manufacturing companies. In the last part, the conclusion, limitation of the study and further proposals for study are presented.

The authors’ contribution to this study resides in (1) filling the literature gap on sustainability reporting and the semiconductor crisis, and (2) the novelty of the study reflected in the comparative approach of two interconnected industries (automobile manufacturing and semiconductor manufacturing) affected by the chip shortage crisis triggered by the SARS-CoV-2 pandemic.

2. Review of current state of the sustainability reporting and the semiconductor crisis

The standardization of sustainability reporting has been the main concern of all economic actors in recent years. Starting from the *Our Common Future* initiative from the Brundtland Report (1987) and reaching the creation of new organizations to deal with the implementation of directives and initiatives, sustainability reporting has become the trend of the 21st century.

Sustainability reporting consists of various approaches, from non-financial reporting to corporate social responsibility (CSR), environmental, social and government (ESG) performance to integrated reporting. In companies and businesses, sustainability is known to bring many benefits, from brand growth to financial growth to better social and environmental outcomes (Pucker, 2021).

2.1. Sustainability reporting standards and initiatives: voluntary or mandatory for organizations?

If investors were focused on the economic performance of an entity, nowadays, they require more disclosures on environmental and social practices before making investment decisions (Siew, 2015). Therefore, companies started to prepare voluntary reports on the sustainability performance encountered in their activities, until those practices became mandatory requirements to be disclosed. Voss (2019) found that voluntary reporting information is beneficial for companies in various sectors. For example, the new CSRD (EU Directive 2022/2464) mandates this obligation for all listed European entities (European Commission, 2022).

Voluntary reporting of information and the preference to choose the appropriate standard for this objective differs from one company to another. As a widely studied topic of voluntary corporate reporting, corporate social responsibility (CSR) is seen as "*the modern way of managing businesses by reflecting business actions for the benefit of society"* (Olanipekun *et al.*, 2021: 425), or a binding force for which entrepreneurs pursue policies or promote social objectives, values, and help to guarantee society's expectations (Halkos and Nomikos, 2021).

Corporate social responsibility regulations, frameworks, and practices have preoccupied accounting researchers in the last decades (Albu *et al.,* 2016). CSR research is expected to be a subject of interest for new researchers in sustainability accounting, as several issues require further investigation: the determinants and consequences of good CSR practices, the process of change in integrating the CSR thinking in organizations, the CSR disclosures and its impact of the institutional context, the role of national regulators in establishing adequate CSR regulations and frameworks promoting CSR practices (Albu *et al.*, 2016; Lungu *et al.*, 2016).

In contrast to the Voss (2019) study, Flower (2015) explains that reporting sustainability activities could reveal negative aspects of company performance, while the variation of sustainability reporting practices raises questions about the quality and comparability of how sustainability reporting is performed (Albu *et al.* 2013; Henriques *et al.,* 2022). Therefore, organizations have teamed up to create a set of principles and standards to help companies achieve their goals and align to the requirements of international laws.

In Europe, Directive 2014/95 (known as Non-Financial Reporting Directive) in all member states was for a couple of years the primary law requiring disclosure of non-financial information, applicable for listed companies with more than 500 employees. At the initiative of the European Commission, European Financial Reporting Advisory Group (EFRAG), a private association, has updated the directive and added the obligation for all listed companies to report information about sustainability performance starting with 5 January 2023 (EFRAG, 2021; European Commission, 2022; KPMG, 2022).

At the international level, the Global Reporting Initiative (GRI) and the International Integrated Reporting Council (IIRC) have been widely used by organizations to prepare sustainability performance reports. GRI is known to be used for voluntary reporting (Halkos and Nomikos, 2021) comprising sustainability-related performance standards, while IIRC is suitable for the creation of an integrated report comprising all financial and non-financial information of an entity (Flower, 2015).

During the crisis period, sustainability reporting is no longer a voluntary action reported by entities. Therefore, mandatory requirements are continuously updated by international standards bodies and initiatives, and their impact on stakeholders is still a topic to be discussed. The main problem is that these standards focus more on climate change than on corporate reporting. A study conducted by KPMG (2022) on ISSB standards (International Sustainability Standards Board) has shown that listed companies will have to focus on corporate values rather than on climate-related disclosures.

Although previous studies present the need for standardization of sustainability reporting and the need to have qualitative and comparable information for investors, Adams and Abhayawansa (2022) consider these to be myths. They noticed that with the SARS-CoV-2 pandemic, the degree of awareness of the problems caused by climate change has increased, and the previously presented needs are driven by a lack of knowledge of all standardization options, especially the GRI standard.

2.2. ESG factors – tools for sustainability reporting

Entities are using several methods to create sustainability performance reports. Companies use environmental, social, and government factors to determine their impact on sustainability. Investors, professionals, and researchers are questioning the reliability, consistency, and quality of these scores (Berg *et al.*, 2021). ESG indicators are "*more related and broader to actions and can determine good management practices*" (Syed, 2017: 2). Environmental factors are calculated considering resources used by an entity, emissions, and innovations that a company has. Social factors contain information about the workforce, human rights, community, and product responsibility.

The least factor, governance, is to analyze management, shareholders, and CSR strategies (Thomson Reuters, 2022). When managers want to capture the attention of investors and the entity's image has a history of sustainability-related scandals, they will use ESG factors, especially ESG controversy factors, to report the business mechanism and the current view of the controversies the company has faced (Passas *et al.*, 2022). According to Thomson Reuters (2022), a controversy factor indicator is calculated using negative events and measures the company's exposure to economic, social, and governmental negative impacts. An analysis of semiconductor crises conducted by KPMG (2023) has exposed the strategies of semiconductor companies. The industry will focus on climate change regulations and formalizing ESG reporting.

2.3. The current state of semiconductor crisis and the relationship with sustainability reporting

The chip shortage problem, as the semiconductor crisis, was triggered by the SARS-CoV-2 pandemic. This anomaly had a significant impact on businesses closely related to the semiconductor industry and the chip production ecosystem from a business and strategy point of view. Automobile manufacturers were hit by the loss of billions of dollars in earnings between 2020 and 2023. The automotive industry was unable to deliver its vehicles on time due to lack of supply. The chip shortage had an impact on the entire network (Marinova and Bitri, 2021).

Semiconductors play a very important role in people's lives. From cars, watches, phones, big and small appliances, they all contain small parts called semiconductors. In the last 30 years, the semiconductor industry has grown exponentially and has had a great economic impact. The annual growth rate from 1990 to 2020 is a compound rate of 7.5%, exceeding the world GDP growth equivalent to 5% per year during the same years (Varas *et al.*, 2021). For example, in the automotive industry, Ford had to stop the production of 70.000 cars in 2021 because it did not have enough semiconductors in 2021 (Boudette, 2021). Its competitor, General Motors, resorted to another strategy as they removed much equipment from the cars to keep production going (Preston, 2021).

However, automobile manufacturing companies were left scrambling in 2021 because, early in the pandemic, plummeting sales spurred them to cut production and cancel many of their semiconductor orders. When they later decided to increase production as consumer interest increased, they found that other companies making products that were in high demand, such as exercise machines and appliances, had already booked the microchip factories capacity (White, 2021).

Blyler (2020) observed that some companies planned to invest in opening new plants to cover the needs of the production, but it is known that it will take up to four years to develop a new factory. Other companies are still trying to develop monitoring and control activities to maintain control of the distribution of chips and demands. People staying home and global shutdowns raised consumer demand for products with an electronic component. To meet their demands, the companies responsible for manufacturing those devices raised their requests to suppliers for more semiconductor chips. Several plants were shut down due to constraints, and some parts were no longer being produced. Foundries and producers were unable to keep up with the surge in demand (Marinova and Bitri, 2021).

Geopolitical tensions, such as the Russian invasion of Ukraine, are causing shortages of noble gasses and precious metals, which are used in chip manufacturing (Alper, 2022; Deutsche Bank, 2022). Additionally, China's digital ambitions have put issues of self-sufficiency and digital sovereignty high on the political agenda (NBR, 2022).

Once sustainability performance becomes a mandatory requirement for companies, it will be observed in detail how companies are managing crises. The lack of clear methodologies for reporting the non-financial information, and the pressure to report was observed in the automotive industry in a study conducted by Perello-Marin (2022). In the chip shortage crisis, semiconductor developers, which are key parts of the automotive industry will have to report sustainability metrics. Only a few studies have analyzed the relationship between sustainability and semiconductor manufacturing. According to Bhat (2016: 152) sustainability reporting will not contribute to cost savings, but "*adoption of programs related to energy savings, water conservation and waste minimization definitely save costs*". Therefore, it is still questionable if reporting information about the non-performance of these industries would be helpful for prevention of crises.

In light of the literature review above, given the need to research sustainability standards and initiatives in the context of the global semiconductor crisis triggered by the SARS-CoV-2 pandemic, ESG controversies, ESG factors and the adoption of United Nations Global Compact principles are expected to influence the performance of companies as measured by Returns on Gross Profits-to-Assets.

The following research hypotheses are tested:

Hypothesis 1 (H1): The performance of automobile and semiconductor manufacturers companies is influenced by ESG controversies in a crisis context.

Hypothesis 2 (H2): ESG factors and the adoption of United Nations Global Compact principles influence the performance of companies in the context of the global semiconductor crisis.

3. Data and methodology

From a methodological point of view, the analysis of sustainability standards and initiatives in the context of the global semiconductor crisis is based on quantitative research. Most of the time, sustainable development was treated from a quantitative perspective in relation to profitability indicators on different statistical samples: (1) listed companies (Noordewier and Lucas, 2020; Aydogmus *et al.,* 2022; Giannopoulos *et al.*, 2022, Cao *et al.*, 2023), (2) a field of activity or groups of industries (Noordeweir and Lucas, 2020; Caby *et al.*, 2022) or (3) depending on the level of development of the countries (Maury, 2022). The contribution of this study is reflected in the comparative approach of the two interconnected economic activities, namely automobile manufacturers and semiconductor manufacturers. The general scope of this study is to observe differences in the influences of a socio-economic event: the global semiconductor crisis triggered by the SARS-CoV-2 pandemic.

In this section, the data of the statistical sample, the description of the variables included in the analysis, followed by the descriptive statistics, and the econometric models resulting from the collection, processing, and testing of the data are presented.

3.1. Sample data

The extracted statistical sample consists of 30 automobile manufacturing companies and 83 semiconductor manufacturing companies from 2019 to 2021 which totals 90 respectively, 249 panel data observations. The data source for this quantitative research came from the Refinitiv Eikon database, also used by other researchers in the sustainability field (Aydogmus *et al.*, 2022; Erhart, 2022; Gigante and Manglaviti, 2022; Pozzoli *et al.*, 2022).

Companies in the Refinitiv Eikon database were filtered according to The Refinitiv Business Classification (TRBC), selecting automobile and semiconductor manufacturers companies. Data collection was conditioned by the existence of information related to sustainability indicators. In *Table 1* a summary of the initial statistical sample is presented.

Table 1. **Initial Sample Data**

	Automobile Manufacturers	Semiconductor Manufacturers
Sample Period	2019-2021	2019-2021
Number of Companies	30	83
Number of Countries	13	17
Total Observations	90	249
Number of Observations by Region		
Americas	12	105
Asia	60	105
Europe	18	36
Oceania	0	3

(*Source*: Refinitiv Eikon, 2023)

Considering the percentage of Asian companies included in the sample (65% automobile manufacturers, respectively 42% semiconductor manufacturers), as well as the outbreak of the SARS-CoV-2 pandemic in Wuhan, China, in 2019 (Ramani *et al.*, 2022), it was justified to use 2019 as the reference year to start the research on companies' sustainability in the context of the global semiconductor crisis. Moreover, this approach is reinforced by the fact that the annual reports are approved in the following year, when companies have the obligation to reflect on the subsequent events to the reporting date (for example, when companies choose to report under IAS 10 - *Events After the Reporting Period)*. On the other hand, in the context in which global semiconductor crisis was triggered by SARS-CoV-2 pandemic, estimated to continue until 2023, or even 2024 (Ramani *et al.*, 2022), data collection stopped in 2021 from considerations for the existence of the information in the Refinitiv Eikon database.

3.2. Variables

The construction of the econometric models was based on a dependent variable to quantifying the financial performance of the companies in the fields included in the comparative analysis, as well as on seven independent variables specific to sustainable development.

Often, research on business sustainability considers the use of Tobin's Q indicator as a dependent variable (Aydogmus *et al.*, 2022; Giannopoulos *et al.*, 2022; Cao *et al.*, 2023). Similarly, other authors quantified the dependent variables in the form of rates of return to measure the financial performance of companies: Return on assets - ROA (Noordewier and Lucas, 2020; Aydogmus *et al.*, 2022; Caby *et al.*, 2022; Maury, 2022; Cao *et al.*, 2023) or Return on Equity - ROE (Caby *et al.*, 2022; Maury, 2022).

Regarding our research on the analysis of sustainability standards and initiatives in the context of the semiconductor crisis, it is considered appropriate to use a profitability indicator as a dependent variable to conclude the differences in influences on companies. The Tobin's Q indicator considers the market value of a company relative to its book value (Cao *et al.*, 2023), which is why we will not use the Tobin's Q indicator in our research. On the other hand, considering that the traditional rates of return are calculated according to the net profit (ROA being the net profit divided by the total assets and ROE the net profit divided by the total equity), in order to avoid differences in the tax systems of the countries will use the dependent variable Returns on Gross Profits-to-Assets (gross profit divided by total assets) also used by Novy-Marx (2013), Acar *et al.* (2018), Kenchington *et al.* (2019).

Seven independent variables specific to the sustainable development of companies were used: ESG Controversies Score, Environmental Pillar Score, Social Pillar Score, Management Score, Shareholders Score, CSR Strategy Score and Global Compact Signatory. Previous research analyzes ESG factors from a global perspective (Giannopoulos *et al.*, 2022; Gigante and Manglaviti, 2022; Schiemann and Tietmeyer, 2022; Anita *et al.*, 2023), as well as through a detailed approach to the structure of ESG indicators: environmental, social and governance (Apergis *et al.*, 2022; Aydogmus *et al.*, 2022; Uyar *et al.*, 2022). Agnese *et al.* (2023) having as their objective the testing of corporate governance rendered by the governance pillar from the structure of ESG factors, they present the governance pillar in three components: Management Score, Shareholders Score and CSR Strategy Score. Therefore, for the development of our econometric models for testing sustainability in the context of the global semiconductor crisis, it was deemed appropriate to detail the governance pillar in its component parts (management, shareholders and CSR strategy). The objective of the investigation is to appreciate the individual effect of the components of corporate governance through a comparative approach of the activities included in the regression analysis, as well as in a crisis context generated by the SarsCov-2 pandemic. Furthermore, the concordance of ESG controversies with international standards, such as the United Nations Global Compact (Anita *et al.*, 2023), justified the inclusion in the research of the independent variable Global Compact Signatory. In addition, for the foundation of the linear regressions, the control variables used were the size and operational efficiency of the companies. Information on the description, sources, and references of the selected variables for sustainability research in the context of the global semiconductor crisis is detailed in *Table 2*.

In order to build statistically valid econometric models, the dependent variable Returns on Gross Profits-to-Assets was identified and included in the analysis, as well as the seven independent variables previously presented and the control variables regarding the size and operational efficiency of the companies. Data were extracted for the period 2019-2021 to observe differences in the influences of the global semiconductor crisis within the two groups of interconnected activities (automobile manufacturers and semiconductor manufacturers).

To define valid and statistically significant econometric models, the linear parametric regression method was used, based on which the connection and intensity between several independent variables likely to influence the dependent variable were analyzed. A model specific to ESG controversies (1) was used (Schiemann and Tietmeyer, 2022; Anita *et al.*, 2023), as well as a model regarding the pillars of the ESG factor, detailing the governance pillar (2) (Apergis *et al.*, 2022; Aydogmus *et al.*, 2022; Uyar *et al.*, 2022; Agnese *et al.*, 2023).

Table 2. **Variable definitions, sources and references**

	Definition	Source	Reference
Dependent variables			
GP_TA: Returns on Gross Profits-to-Assets	Gross profit for the year divided by book total assets.	Refinitiv Eikon	Novy-Marx, 2013; Acar *et al.*, 2018; Kenchington *et al.*, 2019
Independent variables			
ESG_CS: ESG Controversies Score	ESG controversies category score measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media. From 0 (worst) to 100 (best).	Refinitiv Eikon	Shakil, 2021; Schiemann and Tietmeyer, 2022; Treepongkaruna *et al.*, 2022; Agnese *et al.*, 2023; Anita *et al.*, 2023
ENV: Environmental Pillar Score	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value. From 0 (worst) to 100 (best).		Apergis *et al.*, 2022; Aydogmus *et al.*, 2022; Uyar *et al.*, 2022
SOC: Social Pillar Score	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value. From 0 (worst) to 100 (best).		Apergis *et al.*, 2022; Aydogmus *et al.*, 2022; Uyar *et al.*, 2022
MAN: Management Score	Management category score measures a company's commitment and effectiveness towards following best practice corporate governance principles. From 0 (worst) to 100 (best).		Uyar *et al.*, 2022; Agnese *et al.*, 2023
SHA: Shareholders Score	Shareholders category score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices. From 0 (worst) to 100 (best).		Uyar *et al.*, 2022; Agnese *et al.*, 2023
CSR: CSR Strategy Score	CSR strategy category score reflects a company's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes. From 0 (worst) to 100 (best).		Maury, 2022; Uyar *et al.*, 2022; Agnese *et al.*, 2023
GCS: Global Compact Signatory (0/1)	The company has signed the *United Nations Global Compact* which is a non-binding united nations pact to encourage businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation (=1) or not (= 0).		Anita *et al.*, 2023
Control variables			
Log(TA): Size	Logarithm of Total Assets	Refinitiv Eikon	Apergis *et al.*, 2022; Aydogmus *et al.*, 2022
OE: Operational efficiency	Operating costs divided by total operating income		Caby *et al.*, 2022

Therefore, the following two models were run to estimate the results for the two interconnected activities (automobile and semiconductor manufacturers):

$$\text{Model 1: } GP\_TA_{it} = \beta_0 + \beta_1\, ESG\_CS_{it} + \beta_2\, \text{Log}\,(TA)_{it} + \beta_3\, OE_{it} + \varepsilon_{it}$$

$$\text{Model 2: } GP\_TA_{it} = \beta_0 + \beta_1\, ENV_{it} + \beta_2\, SOC_{it} + \beta_3\, MAN_{it} + \beta_4\, SHA_{it} + \beta_5\, CSR_{it} + \beta_6\, GCS_{it} + \beta_7\, \text{Log}\,(TA)_{it} + \beta_8\, OE_{it} + \varepsilon_{it}$$

where GP_TA_{it} is the dependent variable on the performance of the companies included in the econometric analysis to test the impact of business sustainability in the context of the global semiconductor crisis from 2019-2021, ESG_CS_{it}, ENV_{it}, SOC_{it}, MAN_{it}, SHA_{it}, CSR_{it} and GCS_{it} are independent variables specific to sustainable development, while $Log(TA)_{it}$ and OE_{it} represent control variables on companies' size and operational efficiency, and εit is the error term for company *i* in period *t*. To validate econometric models' multifactorial linear regression was used using the SPSS Statistics software.

4. Results and discussion

In *Tables 3* and *4* the descriptive statistics of the endogenous variable, as well as those of the exogenous and control variables, are presented. Descriptive statistics were exposed for the two categories of companies considering the total number of valid observations after removing outliers.

The size of the database for the analysis of sustainability standards and initiatives in the context of the global semiconductor crisis initially totals 90 (for automobiles) and 249 (for semiconductors) panel data observations. To avoid distortion of the regression results, the outliers of the dependent variable, 9 (for automobiles) and 13 (for semiconductors), respectively, were data trimming from the database using the Interquartile Range method (Dash *et al.*, 2023). Information was missing from the database for automobiles: 2 observations on the dependent variable and the control variables, and for the semiconductors: 4 observations on operational efficiency, respectively, 8 observations on the dependent variable and company size.

Table 3. **Descriptive statistics: Automobile Manufacturers**

	N	Mean	St. Dev	Min	Q1	Q2	Q3	Max
Dependent variables								
GP_TA	79	0.118	0.073	-0.054	0.072	0.102	0.153	0.331
Independent variables								
ESG_CS	81	65.674	38.086	1.250	25.521	93.750	100.000	100.000
ENV	81	69.099	27.215	0.000	54.960	81.296	90.076	98.550
SOC	81	59.734	24.869	2.960	43.564	60.352	82.842	95.060
MAN	81	59.041	24.528	11.030	38.369	57.770	79.867	99.240
SHA	81	54.939	29.956	2.940	29.292	56.805	79.986	99.470
CSR	81	59.310	27.892	0.000	43.309	60.304	82.701	97.080
GCS	81	0.400	0.492	0	0	0	1	1
Control variables								
Log(TA)	79	10.573	0.721	8.610	10.157	10.449	11.238	11.720
OE	79	0.931	0.972	0.010	0.794	0.827	0.859	9.380

N is the total number of valid observations after data is trimmed out of the outliers. Q1, Q2, and Q3 are 25%, 50% (median) and 75% percentiles.

Table 4. **Descriptive statistics: Semiconductor Manufacturers**

	N	Mean	St. Dev	Min	Q1	Q2	Q3	Max
Dependent variables								
GP_TA	228	0.215	0.104	0.010	0.143	0.200	0.280	0.480
Independent variables								
ESG_CS	236	93.443	20.278	3.570	100.000	100.000	100.000	100.000
ENV	236	44.906	25.666	0.000	23.253	46.203	66.471	97.510
SOC	236	50.841	25.582	4.910	33.273	54.775	71.662	95.160
MAN	236	59.651	25.637	1.030	38.899	61.426	81.021	99.110
SHA	236	60.192	29.182	0.510	34.423	64.173	86.634	99.770
CSR	236	42.015	33.718	0.000	7.083	36.492	74.294	99.770
GCS	236	0.190	0.394	0	0	0	0	1
Control variables								
Log(TA)	228	9.377	0.754	7.170	8.835	9.292	9.887	11.180
OE	232	0.613	0.168	0.110	0.493	0.629	0.736	0.930

N is the total number of valid observations after data is trimmed out of the outliers. Q1, Q2, and Q3 are 25%, 50% (median) and 75% percentiles.

A Returns on Gross Profits-to-Assets of 11.8% was observed for automobile manufacturers companies and 21.5% for semiconductor manufacturers companies. From this point of view, it is appreciated that semiconductor manufacturers companies have performed better compared to the automobile manufacturers industry in the context of the global semiconductor crisis in the period 2019-2021.

Analyzing the proposed independent variables, it was found that ESG controversies are bigger in the case of companies in the automobile panel, but the environmental and social pillars within the structure of ESG factors are greater in the case of these companies. The components of the governance pillar are: the management score is relatively uniform in the two activities, but the shareholders score is bigger in the case of semiconductor companies, while the CSR strategy score is bigger in the case of the automobile manufacturers industry. It was also observed that within the sample there are several companies in the automobile manufacturers industry that have applied the United Nations Global Compact principles. The control variables were relatively uniform in the two groups, automobile manufacturers companies were slightly larger and more operationally efficient.

Referring to other research in the field in which the same sustainability indicators were used, the sample is relevant for both activities included in the econometric analysis. The ESG Controversies Score was found with average values of approximately 44 points (Shakil, 2021) to 80-95 points (Treepongkaruna *et al.*, 2022; Agnese *et al.*, 2023). At the same time, Environmental Pillar Score, Social Pillar Score and Governance Pillar Score variables are found in research with average values of approximately 30-40 points (Aydogmus *et al.*, 2022; Uyar *et al.*, 2022; Agnese *et al.*, 2023) to 70-80 points (Apergis *et al.*, 2022).

In *Tables 5* and *6* the Pearson correlation matrices for the variables included in the models are presented, a tool for analyzing the link between variables also used by other authors (Aydogmus *et al.*, 2022; Giannopoulos *et al.*, 2022; Anita *et al.*, 2023). It was observed that there was no significant correlation between the dependent variable GP_TA and the other independent variables included in the models (very weak and weak links). An average correlation was also observed between the ESG_CS variable and the other variables specific to the sustainable development of semiconductor manufacturing companies, which is not a concern given the use of the two types of models. Although weak, medium and strong correlations between independent variables included in *Model 2* with respect to the pillars of the ESG factor, detailing the governance pillar, this aspect does not provide the research with sufficient evidence to exclude variables from the model since the correlation analysis of the variables should not be used for the modification of econometric models (Anita *et al.,* 2023).

Table 5. **Pearson correlation matrix: Automobile Manufacturers**

	GP_TA	ESG_CS	ENV	SOC	MAN	SHA	CSR	GCS	Log (TA)	OE
GP_TA	1									
ESG_CS	0.204	1								
ENV	0.253*	-0.452**	1							
SOC	-0.067	-0.690**	0.710**	1						
MAN	-0.341**	-0.432**	0.170	0.294**	1					
SHA	-0.050	-0.467**	0.402**	0.499**	0.126	1				
CSR	-0.198	-0.461**	0.537**	0.698**	0.179	0.344**	1			
GCS	-0.054	-0.589**	0.436**	0.583**	0.183	0.352**	0.716**	1		
Log (TA)	-0.142	-0.834**	0.514**	0.654**	0.423**	0.374**	0.454**	0.441**	1	
OE	-0.270*	0.098	-0.271*	-0.250*	0.112	0.023	-0.230*	-0.094	-0.301**	1

***, * indicate statistical significance at the 1 and 5% levels, respectively.*

Table 6. **Pearson correlation matrix: Semiconductor Manufacturers**

	GP_TA	ESG_CS	ENV	SOC	MAN	SHA	CSR	GCS	Log (TA)	OE
GP_TA	1									
ESG_CS	-0.088	1								
ENV	-0.053	-0.222**	1							
SOC	-0.108	-0.292**	0.801**	1						
MAN	0.064	-0.135*	0.264**	0.291**	1					
SHA	0.079	-0.102	0.126	0.066	0.084	1				
CSR	-0.110	-0.251**	0.691**	0.738**	0.280**	0.104	1			
GCS	-0.064	-0.188**	0.281**	0.382**	0.192**	0.181**	0.460**	1		
Log(TA)	-0.125	-0.422**	0.646**	0.714**	0.290**	0.108	0.657**	0.434**	1	
OE	-0.577**	0.163*	0.022	0.110	-0.034	-0.165*	0.110	-0.023	-0.017	1

***, * indicate statistical significance at the 1 and 5% levels, respectively.*

Before running the linear parametric regressions, the appropriate panel data model was established for the econometric models. The Hausman test was applied to decide whether to use fixed or random-effects models. *Table 7* presents the results of the Hausman test, the application of econometric models with fixed effects, a test also used by the authors Aydogmus *et al.* (2022) and Giannopoulos *et al.* (2022).

Table 7. **Hausman test**

	Automobile Manufacturers		Semiconductor Manufacturers	
	Model 1	Model 2	Model 1	Model 2
Chi-Square Statistic	14.217	21.052	118.909	145.685
p-Value	0.0026	0.0070	0.0000	0.0000
Test Result	Fixed effects	Fixed effects	Fixed effects	Fixed effects

The results of the linear parametric regressions used to define the valid and statistically significant econometric models are presented in *Table 8*. The validity of the regression models is supported by the F-Test, which registers a significance threshold lower than 0.05 in the case of all models. Therefore, there is sufficient evidence to state with a 95% probability that the econometric models are statistically valid. The intensity of the link between the variables is assessed based on the correlation ratio (R), *Model 1* specific to ESG controversies (Schiemann and Tietmeyer, 2022; Anita *et al.*, 2023) registering a weak intensity of the link between the variables in the case of automobile manufacturers (R< 0.4), however, it was important that the intensity of the link between the variables in the case of the other models was strong (R>0.6).

Table 8. **Fixed Effects Regressions Results**

	Automobile Manufacturers		Semiconductor Manufacturers	
	Model 1	Model 2	Model 1	Model 2
ESG_CS	0.000		-0.001*	
ENV		0.002***		0.000
SOC		0.000		0.000
MAN		-0.001**		0.000
SHA		0.000		0.000
CSR		-0.001***		0.000
GCS		0.029		-0.001
Log(TA)	-0.012	-0.024	-0.041***	-0.044***
OE	-0.022**	-0.017**	-0.355***	-0.364***
R	0.395	0.678	0.632	0.631
R Square	0.156	0.460	0.400	0.398
Adjusted R Square	0.097	0.378	0.386	0.370
F test	2.629**	5.613***	29.050***	14.094***
Observations	77	77	224	224

****, **, * indicate statistical significance at levels of 1, 5, and 10%, respectively.*

From the perspective of the results of the developed econometric models, it is concluded that the performance of automobile manufacturing companies is not influenced by ESG controversies (H1 is rejected), but the ESG factors with the detailing of the governance pillar in its component parts (management, shareholders, CSR strategy), as well as the principles United Nations Global Compact influences their performance (H2 is accepted). Analyzing the models related to automobile manufacturers, in the case of *Model 1*, Returns on Gross Profits-to-Assets is inversely proportionally influenced only by the operational efficiency of the companies. On the other hand, in the case of *Model 2*, a directly proportional influence of environmental factors is found (for an increase of 1 point in the Environmental Pillar Score, Returns on Gross Profits-to-Assets will increase by 0.2 percentage points), as well as an influence indirect effect of management factors, CSR strategy and operational efficiency of companies.

On the other hand, it is estimated that in the case of semiconductor manufacturing companies, their performance is influenced by environmental, social and governance controversies (H1 is accepted), but ESG factors and the adoption of United Nations Global Compact principles do not influence the companies' financial performance (H2 is rejected). Regarding semiconductor manufacturing activity, an inversely proportional influence of ESG controversies on Returns on Gross Profits-to-Assets is found (for a 1-point increase in ESG Controversies Score, Returns on Gross Profits-to-Assets will decrease by 0.1 percentage points), as well as negative influences of control variables (operational efficiency and company size).

In summary, in the context of the global semiconductor crisis triggered by the SARS-CoV-2 pandemic, it is appreciated that, in the case of automobile manufacturers companies, the development of management practices to avoid environmental risks and to capitalize on environmental opportunities to generate long-term shareholder value led to increased Returns on Gross Profits-to-Assets. Apergis *et al.* (2022) concludes the negative impact of environmental pillar on bond yield, while Aydogmus *et al.* (2022) highlight the positive relationship of environmental factors (Environmental Pillar Score) with the performance of listed companies from 2013 to 2021, conclusions that support the results of our research. Furthermore, the development of the commitment and effectiveness of automobile manufacturers companies towards the observance of the best corporate governance practices, as well as the development of practices to communicate the integration of economic, social and environmental dimensions in the decision-making processes led to the reduction of the Returns on Gross Profits-to-Assets. From a global perspective, Aydogmus *et al.* (2022) presents the positive relationship of the governance pillar with the value and performance of companies, and Apergis *et al.* (2022) argue for the negative relationship between corporate governance and bond yields. However, Maury (2022) presents in his results the negative influence of the CSR strategy on the return rates specific to measuring the financial performance of companies.

The influence of ESG controversies was observed in the case of semiconductor manufacturers companies that showed a negative relationship. Contrary to theoretical predictions, by decreasing companies' exposure to environmental, social, and governance controversies, Returns on Gross Profits-to-Assets tends to decrease. Treepongkaruna *et al.* (2022) highlighted the theoretical claims regarding the influences of ESG controversies on companies' performances (positive relationship: companies' profitability is significantly higher when they are involved in fewer ESG controversies). On the other hand, ESG controversies have been negatively associated with the value of Indian companies (Anita *et al.*, 2023). The results (semiconductor companies involved in more ESG controversies perform better) were seen as justified in the context of the global semiconductor crisis, a period in which companies' semiconductor offerings were affected by socio-economic events, while the demand in this market has been continuously increasing. The control variables (firm size and operational efficiency) had negative relationships with Returns on Gross Profits-to-Assets. Similar influences of company size (Aydogmus *et al.*, 2022; Apergis *et al.*, 2022) and operational efficiency (Caby *et al.*, 2022) were found.

5. Conclusions

This research analyzed the influence of sustainable development on the performance of companies using the comparative approach of the automobile manufacturing and semiconductor manufacturing companies in the context of the global semiconductor crisis. The literature review exposed that the standardization of sustainability information has appeared as a need for investors to have a company's environmental and social information performance available before making investment decisions (Pucker, 2021). Therefore, companies prepared voluntary reports using sustainability reporting tools (CSR tools and ESG factors) with the help of international reporting standards and initiatives (such as GRI or IIRC). Sustainability reporting is now mandatory, but standards focus more on climate changes than on corporate reporting, however, those need to be revised (KPMG, 2022). Adams and Abhayawansa (2022) consider this revision to be a myth due to a lack of knowledge of all standardization options. Nevertheless, this need for standardization was pronounced once recent crises such as chip shortage have been observed to be affecting key industries.

The analysis of sustainability standards and initiatives through a comparative approach of two interconnected economic activities (automobile manufacturers and semiconductor manufacturers) led to the conclusion of the differences in the influences of a socio-economic event (the semiconductor crisis felt globally triggered by the SARS-CoV-2 pandemic). In the analyzed crisis context, the performance of automobile manufacturing companies was influenced by ESG factors, while the performance of semiconductor manufacturing companies was influenced by environmental, social and governance controversies. Contrary to theoretical predictions, through exposure to ESG controversies, the Returns on Gross Profits-to-Assets of semiconductor manufacturing companies tends to increase, which has led to opportunities in a crisis context for this activity. On the other hand, no business opportunities related to ESG controversies have been concluded within the automotive industry.

This research was limited by the scarcity of data. Further studies might include an analysis of other industries affected by the semiconductor crisis and an investigation of the sustainable practices or strategies taken to avoid another crisis in the field.

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References

Acar, S., Voyvoda, E., & Yeldan, E. (2018) „Chapter 4 - Modeling for Green Growth: Environmental Policy in a Dualistic Peripheral Economy”, *Academic Press*, vol. 1, no. 1: 93-116

Adams, C.A. & Abhayawansa S. (2022) „Connecting the COVID-19 pandemic, environmental, social and governance (ESG) investing and calls for ‘harmonisation’ of sustainability reporting”, *Critical Perspectives on Accounting*, vol. 82: 1-13

Agnese, P., Battaglia, F., Busato, F. & Taddeo, S. (2023) „ESG controversies and governance: Evidence from the banking industry”, *Finance Research Letters*, vol. 53: 1-7

Albu, C.N., Balsari, C. & Krasodomska, J. (2016) „Introduction to the Special issue on Corporate Social Reporting in Central and Eastern Europe”, *Accounting and Management Information Systems*, vol. 15, no. 2: 193-205

Albu, N., Albu, C.N., Dumitru, M. & Dumitru, V.F. (2013) „Plurality or convergence in sustainability reporting standards?”, *Amfiteatru Economic*, vol. 15, no. 7: 729-742

Alper, A. (2022) „Russia attack on Ukraine halts half of world’s neon output for chips”, available on-line at https://www.reuters.com/technology/exclusive-ukraine-halts-half-worlds-neon-output-chips-clouding-outlook-2022-03-11/, accessed at 23.03.2023

Anita, M., Shveta, S., Surendra, S.Y. & Arvind, M. (2023) „When do ESG controversies reduce firm value in India?”, *Global Finance Journal*, vol. 55: 1-18

Apergis, N., Poufinas, T. & Antonopoulos, A. (2022) „ESG scores and cost of debt”, *Energy Economics*, vol. 112: 1-10

Aydogmus, M., Gulay, G. & Ergun, K. (2022) „Impact of ESG performance on firm value and profitability”, *Borsa Istanbul Review*, vol. 22, no. 2: 1-10

Berg, F., Fabisik, K. & Sautner, Z. (2021) „Is history repeating itself? The (Un)predictable past of ESG Ratings", available on-line at https://ssrn.com/abstract=3722087, accessed at 23.03.2023

Bhat, S.H. (2016) *Silicon Revolution: Sustainability Disclosures and Performance in the Semiconductor Manufacturing Industry (2010-2014)*, San Jose State: University ProQuest Dissertations Publishing

Blyler, J. (2020) „Semiconductor chip developers will face COVID-19 challenges and new tech", available on-line at https://www.designnews.com/electronics/eda-market-evolving-amid-covid, accessed at 20.03.2023

Boudette, N.E. (2021) „Ford profit drops 50 percent because of a global chip shortage", available on-line at https://www.nytimes.com/2021/07/28/business/ford-q2 earnings.html, accessed at 20.03.2023

Brundtland, G.H. (1987) „Our Common Future: Report of the World Commission on Environment and Development", available on-line at https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf, accessed at 12.03.2023

Caby, J., Ziane, Y. & Lamarque, E. (2022) „The impact of climate change management on banks profitability", *Journal of Business Research*, vol. 142: 412–422

Cao, S., Yao, H. & Zhang, M. (2023) „CSR gap and firm performance: An organizational justice perspective", *Journal of Business Research*, vol. 158: 1-10

Dash, C.S.K., Behera, A.K., Dehuri, S. & Ghosh, A. (2023) „An outliers detection and elimination framework in classification task of data mining", *Decision Analytics Journal*, vol. 6: 1-8

Deutsche Bank (2022) „Extraordinary semiconductor cycle triggered by one-time events, cyclical and geopolitical effects", available online at https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000522983/Extraordinary_semiconductor_cycle_triggered_by_one.pdf, accessed at 23.03.2023

EFRAG (2021) „Sustainability Reporting Standards Roadmap", available on-line at https://www.efrag.org/Activities/2010051123028442/Sustainabilityreporting%20standards-roadmap?AspxAutoDetectCookieSupport=1, accessed at 11.03.2023

Erhart, S. (2022) „Take it with a pinch of salt - ESG rating of stocks and stock indices", *International Review of Financial Analysis*, vol. 83: 1-10

European Commission (2022) „Corporate sustainability reporting", available on-line at https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en, accessed at 15.03.2023

Flower, J. (2015) „The International Integrated Reporting Council: A story of failure", *Critical Perspectives of Accounting*, vol. 27: 1-17

Giannopoulos, G., Fagernes, R.V.K., Elmarzouky, M. & Hossain, K.A.B.M.A. (2022) „The ESG Disclosure and the Financial Performance of Norwegian Listed Firms", *Journal of Risk and Financial Management*, vol. 15, no. 6: 1-16

Gigante, G. & Manglaviti, D. (2022) „The ESG effect on the cost of debt financing: A sharp RD analysis", *International Review of Financial Analysis*, vol. 84: 1-12

Halkos, G. & Nomikos, S. (2021) „Corporate social responsibility: Trends in global reporting initiative standards", *Economic Analysis and Policy*, vol. 69: 106-117

Henriques, R., Gaio, C. & Costa, M. (2022) „Sustainability Reporting Quality and Stakeholder Engagement Assessment: The Case of the Paper Sector at the Iberian Level", *Sustainability*, vol. 14: 1-14

Kenchington, D., Wan, C. & Yüksel, H.Z. (2019) „Gross profitability and mutual fund performance", *Journal of Banking and Finance*, vol. 104: 1-19

KPMG (2022) „Comparing sustainability reporting proposals", available on-line at https://assets.kpmg.com/content/dam/kpmg/au/pdf/2022/comparing-sustainability-proposals-talkbook-au.pdf, accessed at 20.03.2023

KPMG (2023) „Navigating short term-volatility in the semiconductor industry”, available on-line at https://advisory.kpmg.us/articles/2022/global-semiconductor-industry-outlook-2023.html, accessed at 15.03.2023

Lungu, C.I., Caraiani, C., Dascălu, C., Turcu, D. & Turturea, M. (2016) „Archival analysis of Corporate Social Responsibility research: the Romanian perspective”, *Accounting and Management Information Systems*, vol. 15 no. 2: 341-371

Marinova, G.I. & Bitri, A.K. (2021) „Challenges and opportunities for semiconductor and electronic design automation industry in post Covid-19 years”, available on-line at https://iopscience.iop.org/article/10.1088/1757-899X/1208/1/012036/pdf, accessed at 18.03.2023

Maury, B. (2022) „Strategic CSR and firm performance: The role of prospector and growth strategies”, *Journal of Economics and Business,* vol. 118: 1-16

NBR (2022) „China’s digital ambitions: a global strategy to the supplant the Liberal Order, available on-line at https://www.nbr.org/publication/chinas-digital-ambitions-a-global-strategy-to-supplant-the-liberal-order/, accessed at 17.03.2023

Noordewier, T.G. & Lucas, M.T. (2020) „On being green and profitable: Does industry context matter?”, *International Journal of Production Economics,* vol. 223: 1-12

Novy-Marx, R. (2013) „The other side of value: The gross profitability premium”, *Journal of Financial Economics,* vol. 108: 1-28

Olanipekun, A.O., Omotayo, T. & Saka, N. (2021) „Review of the Use of Corporate Social Responsibility (CSR) Tools”, *Sustainable Production and Consumption,* vol. 27: 425-435

Passas, I., Ragazou, K., Zafeiriou, E., Garefalakis, A. & Zopounidis, C. (2022) „ESG Controversies: A quantitative and Qualitative Analysis for the Sociopolitical Determinants in EU firms”, *Sustainability,* vol. 14: 1-17

Perello Marin, M.R., Rodriguez, R. & Alfaro-Saiz, J.J. (2022) „Analysing GRI reports for the disclosure of SDG contribution in European car manufacturers”, *Technological Forecasting & Social Change*, vol. 181: 1-10

Pozzoli, M., Pagani, A. & Paolone, F. (2022) „The impact of audit committee characteristics on ESG performance in the European Union member states: Empirical evidence before and during the COVID-19 pandemic”, *Journal of Cleaner Production,* vol. 371: 1-13

Preston, B. (2021) „Some automakers say chip shortage causing a delay of certain features”, available online at https://www.consumerreports.org/automotive-industry/chip-shortage-causing-automakers-to-delay-certain-features-a1131554218/, accessed at 20.03.2023

Pucker, K.P. (2021) „Overselling sustainability reporting”, available on-line at https://hbr.org/2021/05/overselling-sustainability-reporting, accessed at 11.03.2023

Ramani, V., Ghosh, D. & Sodhi, M.S. (2022) „Understanding systemic disruption from the Covid-19-induced semiconductor shortage for the auto industry”, *Omega,* vol. 113: 1-15

Schiemann, F. & Tietmeyer, R. (2022) „ESG Controversies, ESG Disclosure and Analyst Forecast Accuracy”, *International Review of Financial Analysis,* vol. 84: 1-15

Shakil, M.H. (2021) „Environmental, social and governance performance and financial risk: Moderating role of ESG controversies and board gender diversity”, *Resources Policy,* vol. 72: 1-10

Siew, R.Y.J. (2015) „A review of corporate sustainability reporting tools (SRTs)”, *Journal of Environmental Management,* vol. 166: 180-195

Syed, A.M. (2017) „Environment, social, governance (ESG) criteria and performance of managers”, *Cogent Business and Management,* vol. 4, no. 1: 1-17

Thomson Reuters (2022) „Environmental, social and governance scores from Refinitiv”, available on-line at https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf, accessed at 20.03.2023

Treepongkaruna, S., Kyaw, K. & Jiraporn, P. (2022) „Shareholder litigation rights and ESG controversies: A quasi-natural experiment", *International Review of Financial Analysis*, vol. 84: 1-13

Uyar, A., Kuzey, C. & Karaman, A.S. (2022) „ESG performance and CSR awards: Does consistency matter?", *Finance Research Letters*, vol. 50: 1-9

Varas, A., Varadarajan, R., Godrich, J. & Yinug, F. (2021) „Strengthening the global semiconductor supply chain in an uncertain", available on-line at https://www.semiconductors.org/wp-content/uploads/2021/05/BCG-x-SIA-Strengthening-the-Global-Semiconductor-Value-Chain-April-2021_1.pdf, accessed at 23.03.2023

Voss, G.W. (2019) „The European Union's 2014 non-financial reporting: Mandatory ex post disclosure - but does it need improvement? in Extractive Industries and Human Rights in an Era of Global Justice: New Ways of Resolving and Preventing Conflicts", available on-line at https://hal.science/hal-02562673/file/%5B20%5D%20Ch%2014.pdf, accessed at 26.03.2023

White, A. (2021) „Report shows U.S. automakers bearing brunt of chip shortage in North America", available on-line at https://www.caranddriver.com/news/a36519857/chip-shortage-aut-production-cuts/worlds-neon-output-chips-clouding-outlook-2022-03-11/, accessed at 20.03.2023

To UBI or Not [to] UBI? Universal Basic Income Creating Value in Rural Romania

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Abstract: *This paper investigates the effectiveness of basic-income social policies in rural areas of Romania. Rural areas, once a thriving bulwark of socio-economic stability in the country, have been grappling for decades with the tsunami effect of ill-fated socio-economic reforms of the 90s, which dragged the rural economy, and its people, in a vicious cycle of poverty. Constant economic migration, depopulation, lack of basic needs, and a generation of newly orphaned children hiding in plain sight - the byproduct of economic migration and lack of education - constitute the new dire reality of a once prosperous blend of small economies. Under these circumstances, providing unconditional guaranteed income, independent of any other revenue streams, seems a natural way of alleviating the effects of systemic, multidimensional poverty, present in aforementioned areas. With mostly non-existent government programs, and a weak business sector, it seems that responsibility of such targeted interventions rests on the shoulders of third sector organizations. We argue that impact and benefits of such programs far outweigh their monetary costs, and the stigma associated with "social welfare" proposals.*

Keywords: *Universal Basic Income, multidimensional poverty, basic-income policies, blended value accounting, (in)commensuration.*

1. Introduction

Rural areas of Romania have become, since 1990s, for the most part, the *terra incognita* of socio-economic reforms, only to be back in focus for a short time every four years, during election cycles. A destructive mix of education inadequacy, economic paucity, and hopelessness, created an outflow of economic migration towards the richer (and farther) areas of Europe, a causal nexus for the further erosion of already scarce economic opportunities. The remaining rural inhabitants of ever shrinking, destitute villages, once being only occasionally poor, have faced decades of economic decay, and gradually become cyclically poor, then usually poor, to the point where they are experiencing persistent, multidimensional poverty (Concern Worldwide US, 2022).

Multidimensional poverty takes into consideration several factors, both nonmonetary and monetary. The nonmonetary criteria include food, health, education, social security, housing material quality, and housing services. The monetary criteria apply to people who earn a per capita income below the poverty line, estimated at $2.15 a day (World Bank Group, 2022). Individuals are in extreme multidimensional poverty if they are deprived of at least three social rights and their per capita income is below the extreme poverty line, which includes only the value of a food basket (Caamal-Olvera *et al.*, 2022). United Nations Development Programme (UNDP) estimates that 1.2 billion

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people are multidimensionally poor, with 593 million, about half of them, being children under 18 years of age (United Nations, 2022).

People experiencing persistent, multidimensional poverty, have only one way to change their *status quo*: targeted intervention on several levels, with a deep analysis of multidimensional aspects of poverty (Duclos *et al.*, 2013), and the subsequent adequate response for each dimension, with the targeted implementation of said response (Alkire *et al.*, 2017). One of the impediments to finding proper solutions to such global problems as the multidimensional poverty is the stigma that has always been associated with the state of being poor, a topic that has been for centuries an uncomfortable truth in the antechambers of power.

We argue that eradicating poverty (and overcoming resource scarcity) has to start with phasing out, globally, the shame associated with extreme need, which is mostly financial, but not always so, and by acknowledging the multiple types of wealth available to our disposal; then, by understanding the dire point of no return in a person's life, from where only targeted interventions at individual levels may help, both in monetary and nonmonetary areas.

We present three case studies that argue in favor of positive socio-economic impact of monetary programs with no strings attached, which in turn will leverage some nonmonetary areas, and help foster socio-economic development of individuals in many dilapidated areas of the world. While seemingly difficult at first, due to its various challenges associated to its multidimensional aspect, we strongly argue that such focused approaches have the tendency to build wealth in areas once battered by socio-economic storms of the political winds of change.

2. Poverty and basic-income programs

In the mid-2000s, while working with children in rural areas of Romania, researchers noticed that most parents were working abroad, and grandparents, various relatives, or even the neighbors unwillingly became *de facto* parents (Ureche, 2022). Only a decade earlier, the whole world was horrified by the studies and movies documenting the "Romanian orphan children crisis", with more than 170,000 children placed in institutions weren't developing basic emotional skills for lack of care. The child welfare system of institutionalized children who could not be cared for their parents was failing them *en masse* (Johnson and Groze, 1994). Furthermore, the EU expansion to Eastern Europe with the 2007 new entrants, Romania and Bulgaria, saw a massive population displacement from rural Romania towards wealthier countries of Western Europe, Romania having the highest number of migrants from all the Eastern European countries (Eurostat, 2017). Moreover, in the Southwest region where we did the bulk of our work, the demographic dynamics had historically higher values of attrition, and had recorded a decrease by 4.63% of the population at regional level as compared to a decrease of 1.7% recorded at national level (Vîlcea, 2014).

The four types of poverty as defined by Concern Worldwide Organization are the *occasionally poor*, the *cyclical poor*, the *usually poor*, and the *always poor* (figure 1). The occasionally poor are people living in transient poverty, who can be severely impacted by a natural disaster such flooding, earthquake, mudslide, or a tornado. The *cyclically poor* are people who generally rely on cyclical activities, such as agriculture, akin with the people from rural areas of Romania. During harvest times, they enjoy a certain abundance, only to lose it and fall under the poverty threshold outside harvesting season, or during droughts, flooding, and other disasters. The *usually poor* are the opposite of occasionally poor. They cannot exit poverty by themselves, but only if one of their family members receives a job, or a windfall. And finally, the *always poor*, the most underprivileged, are consistently under the poverty line, and they cannot move up without an exogenous intervention (Concern Worldwide, 2023).

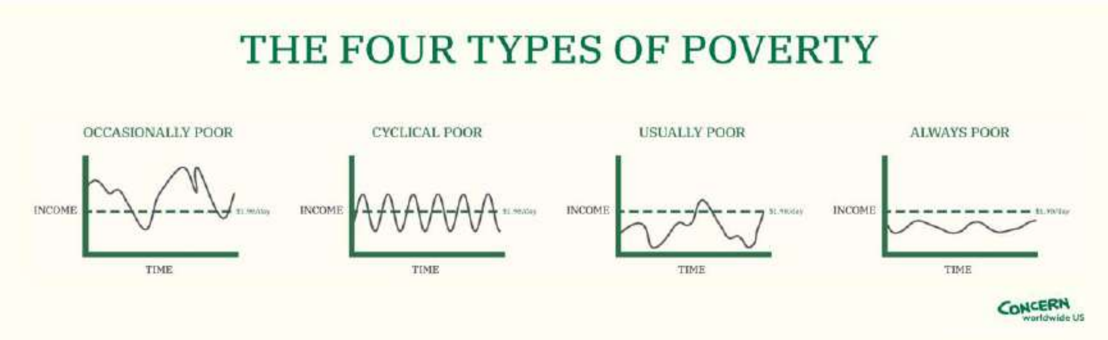

Figure 1. **The four types of poverty**
(Source: ConcernUSA.org*)*

While measuring the impact of basic-income programs on tackling the vicious cycle of poverty, the interventionist researcher aims to flip the poverty paradigm on its head. Through the lens of Nobel Prize winner Amartya Sen, poverty is seen as "deprivation of basic capabilities" (Sen, 1999), hence eradicating poverty is a matter of fulfilling such needs. Thus, the occasionally poor would become *occasionally in need* to fulfill basic capabilities, the cyclically poor become *cyclically in need*, usually poor are the *usually in need*, and the always poor are the most unfortunate who are *always in need*.

Generally, basic-income programs are meant to provide a financial safety net for everyone involved, with no strings attached, and without the bureaucracy, and/or associated administrative costs of means-tested benefits (Allas *et al.*, 2020), which is why they are usually called Universal Basic Income (UBI) programs.

There are many countries and cities that have experimented over the years with basic-income social programs, which have shown great promise for the future. One considerable drawback to most programs is their limited duration, driven either by limited funding, due either to political, or economic implications, or simply to the "experimental" nature of the program. As the levels of poverty were decreasing at the end of the second decade of the new millennium, COVID-19 pandemic caused another 70 million people to fall below the poverty levels (World Bank Group, 2023). Under these circumstances, there is more and more discussion about unconditional basic-income programs, such as UBI.

In the past few decades, many countries including United States, Finland, Canada, Brazil, Spain, Germany, Kenya, Iran, Japan, have considered, and implemented various UBI models. Below (figure 2) is a map of the countries that have experimented where UBI ideas and programs have been present over the years. A more comprehensive map, below, shows the countries where UBI has been fully implemented (Iran, and oil-rich country), as well as countries with pilot programs in place (United States, Canada, Brazil, United Kingdom, Finland, India, Spain, The Netherlands, Germany), partial implementations, COVID-spurred policies, or mere discussions. One successful program, although not shown on this map, has been implemented in Romania, since 2007, and it is still ongoing. In our paper, we will share the results of such experiment, arguing strongly in favor of basic-income programs, in particular hoping to tilt the balance in favor of Universal Basic Income.

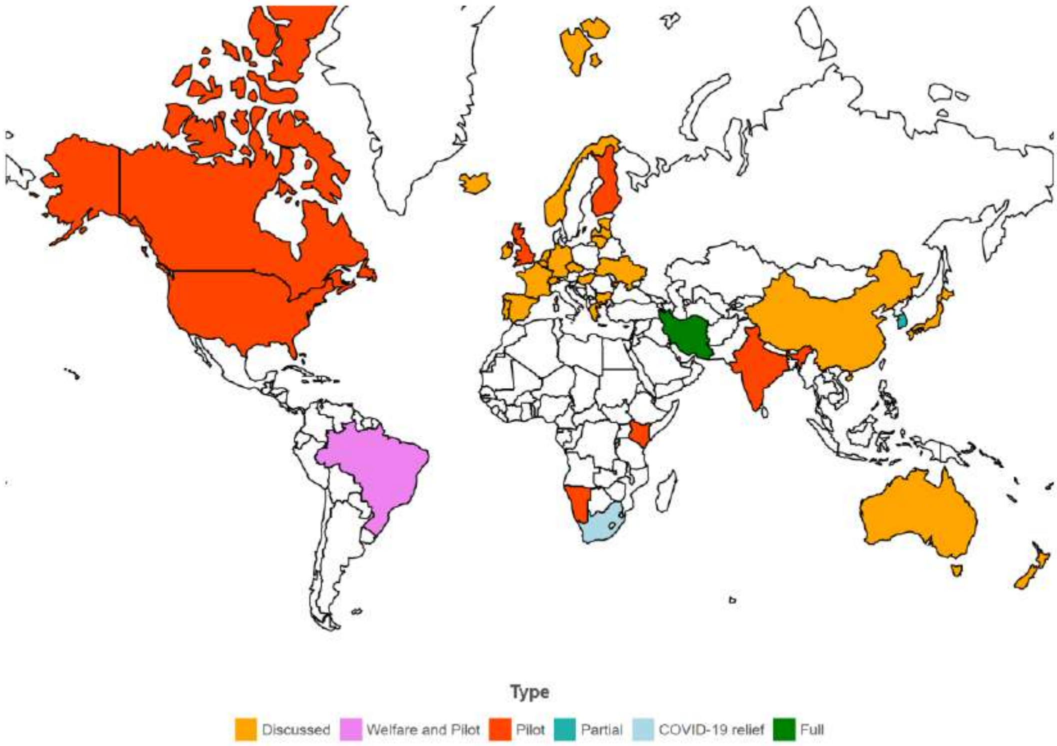

Figure 2. **Countries with Universal Basic Income (UBI) in 2023**
(Source: www.WorldPopulationReview.com*)*

The overwhelming majority of experiments in UBI were considered successful, at least through the recipients' perception, which reported increased levels of mental health, physical health, employment, and trust. Below are the results of a two-year Finnish experiment on 2000 of its (unemployed) citizens. They were offered 560 euros every month, for two years. Shown are the reported areas impacted by the UBI study: mental health, physical health, employment, and trust.

The Basic Income Earth Network (BIEN) is one of many groups devoted to the promotion and implementation of universal basic income in countries around the world. According to BIEN, the characteristics of Universal Basic Income (UBI) are as follows:

- Periodic: distributed in regular payments
- Cash payment: distributed as funds, not coupons or vouchers
- Individual: paid to every adult citizen, not just every household
- Universal: it is paid to all citizens, regardless of their situation
- Unconditional: there are no requirements regarding employment status or any other criteria (BIEN, 2023)

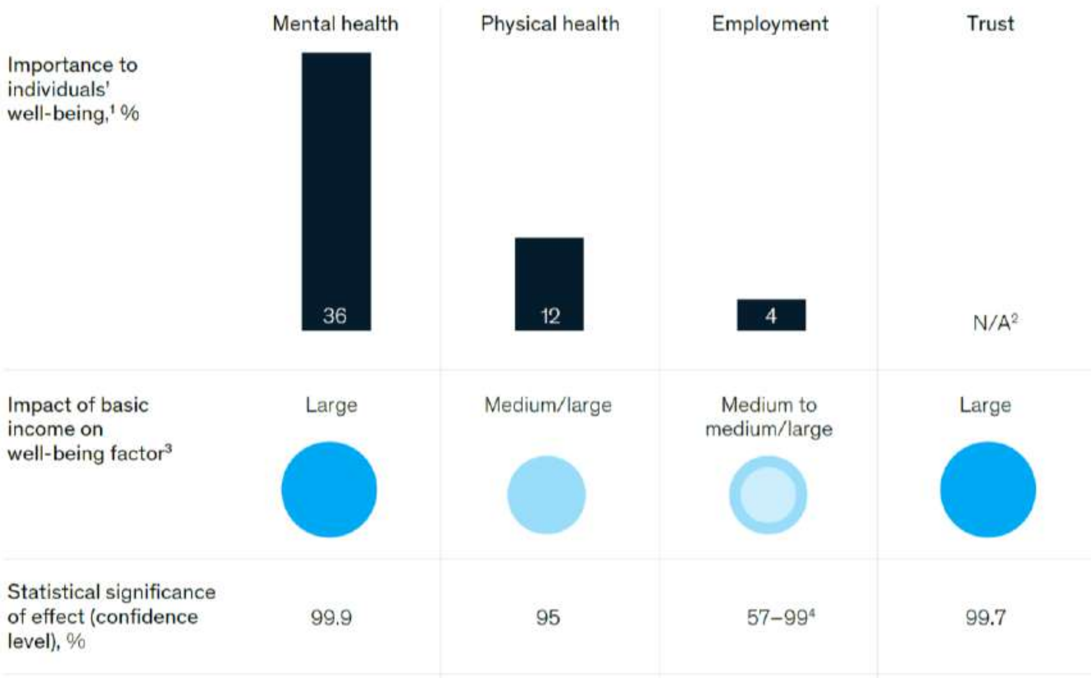

Figure 3. **Importance and impact of four wellbeing factors in Finnish study**
(*Source*: Allas *et al.*, 2020)

3. Methodology and framework

After careful consideration, researchers have chosen the interventionist research (IVR) methodology, originally created by German-American psychologist Kurt Lewin. IVR has capability to produce research with theoretical, practical, and societal relevance. This is due to IVR's unique duality of both theoretical and practical output combined with its capacity to effect social change (Baard and Dumay, 2021), and this is why it has been recently receiving increasing interest and attention among management accounting researchers.

Evaluating the impact of social programs has presented researcher with the daunting task of measuring some things that may not be entirely quantifiable. Thus, aiming to define a comprehensive set of tools for quantifying the outcome of basic-income policies on impoverished populace may pose substantial challenges to the simple act of aligning the outputs and inputs, and calibrating the outcome.

The funds for the UBI program were provided through a 501(c)(3) NGO from United States. Historically, there has been a perception related to financial reporting of the NGOs, namely that they are not reporting well, or 'well-enough'. Demand for NGOs to become more accountable only renders their actions measurable, and their performance commensurable, therefore consistent and comparable. (Power, 1996). In our case, aside from the monetary aspects, several other areas of interest were closely monitored: trust (in oneself, and in others), health (both physical and emotional), goal setting and goal reaching abilities of each individual, school or work achievements, extracurricular involvement, as well as their obvious financial achievements.

Through ethnography, action research, phenomenological research, and narrative research, the authors were able to have a better, more detailed understanding of the changes in individuals' lives through targeted monetary (and their associated nonmonetary) interventions.

3.1. Multiple capitals, and types of wealth

In measuring performance of an NGO, McCulloch and Ridley-Duff (2019) present an Aristotelian perspective of two seemingly antithetical accounting systems, of two concepts still feuding in the social sphere (Nicholls, 2010), namely for-profit vs. non-profit, the former being designed to gauge shareholders' returns, and the other being mission oriented, not intended to tally return of investments. In their research, the two researchers showcase the existence of *multiple capitals*, namely six: financial, manufactured, intellectual, social/relational, human, and natural, which correspond to *six types of wealth*, thus arguing against the abovementioned paradigms, such as the pursuit of profit (for-profit) and social objectives (not-for-profit) as being divergent (figure 4). Conversely, measuring the performance of a basic-income program presents a tangible, financial perspective, yet researchers are aware of the importance of a less tangible, non-financial lens for showing dramatic improvements in a person's life. Our goal is to showcase the importance of non-financial capitals as well into creating a well-rounded individual contributing to society.
Oström (2005) distinguishes between natural capital, social capital and human capital, managed through polycentric governance. From a Bourdieusian perspective, social capital, cultural capital, financial capital, and symbolic capital can assume both monetary and non-monetary forms as well as tangible and intangible (Gilleard, 2020). In measuring the impact of NGOs programs, O'Dwyer and Unerman (2006) favor of an expanded concept of accountability, to a wider set of stakeholders, which is anyone who may be impacted by the organization's activities. This stakeholder approach is meant to create added accountability and greater value for all parties involved (Freeman, 2010), with a more holistic accountability 'expands the concept of' performance.

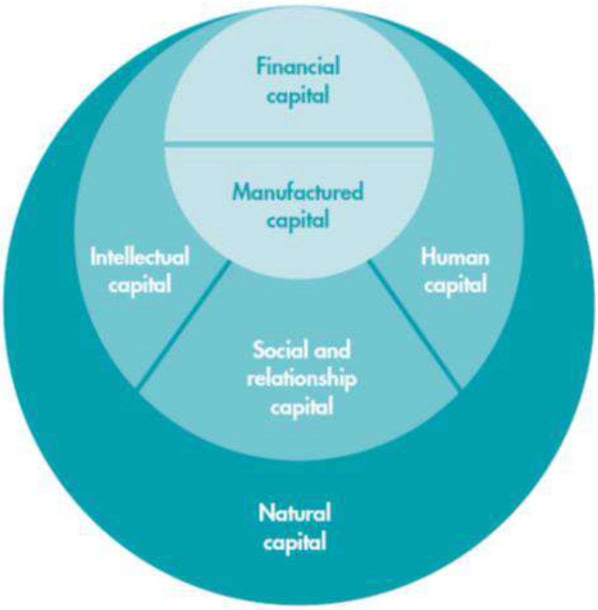

Figure 4. **IIRC representation of the six capitals**
(*Source*: IIRC, 2013)

The International Integrated Reporting Council distinguishes between six types of capital: financial capital, manufactured, intellectual, human capital, social and relationship capital, and finally, natural capital, as shown in figure 4 (IIRC, 2013).

Aristotle did not look at economics through the narrow lens of simply increasing the financial capital, but considered a well-ordered society, with a more rational and sensible distribution of resources, in pursuit of a good life. A more balanced allocation would also lead to an increase in various other forms of capital, such as the creation of social capital, and the (re)generation of social wealth, alongside the natural, human, and intellectual capitals (Ridley-Duff, Wren and McCulloch, 2019). Oström noticed how social capital is increased rather than decreased through use (Oström, 2005). The same argument needs to be applied to human capital: our skills become better with use.

Measuring the results however can be challenging, especially in a space where multiple capitals coexist and interact in perfect harmony, at the intersection of natural, financial, economic, intellectual, social and relational, and human interests, with the added burden of weighting the commensurable and (in)commensurable altogether (Apostol *et al.*, 2023).

Social return on investment (SROI) is a technique originally devised in the United States, designed to measure socio-economic and environmental impact, and combines cost-benefit analysis, stakeholder engagement, financial proxies and project improvement. This can be used for a small activity, or a project, or expanded to the entire organization. It can be applied to every sector: government, business, and NGOs (Maldonado and Corbey, 2016).

The process of framing performance measurement creates structures of calculation, and action. To assist with the analysis of performance calculation, Callon and Law (2005), as well as Callon and Muniesa (2005), break down the process into three stages:

- '**First, the relevant entities are sorted out, detached, and displayed within a single space**. Note that the space may come in a wide variety of forms or shapes: a sheet of paper, a spreadsheet, a supermarket shelf, or a court of law—all of these and many more are possibilities.
- **Second, those entities are manipulated and transformed**. Relations are created between them, again in a range of forms and shapes: movements up and down lines; from one place to another; scrolling; pushing a trolley; summing up the evidence.
- **And, third, a result is extracted**. A new entity is produced. A ranking, a sum, a decision. A judgment. A calculation. And this new entity corresponds precisely to—is nothing other than—the relations and manipulations that have been performed along the way.' (Callon and Law, 2005: 719, with the emphasis added).

Cuckston (2021) builds on the process, acknowledges the shortcomings of narrow measurements of NGO performance within either hierarchical structures, or imposed, coercive, formal, compliance-based, for organization who voluntarily take responsibility of their actions, and open themselves to public scrutiny. Acknowledging the tensions between stricter quantification of performance and a more social, holistic view, the researcher favors the latter, which is opening the organization to a wider set of stakeholders (Cukston, 2021).

A similar construct postulated by Nicholls (2009), ‘blended value accounting’ brings the mission objectives front and center, with social entrepreneurs using reporting practices creatively as strategic tools for resource assessment, mission fulfillment, expanding reach, and organizational growth.

3.2. The longest running Universal Basic Income in the world

Children Aid and Development Organization (Children Aid and Development) is a 501(c)(3) non-profit organization established in 2003 in California. Through various sources of private funding, it started in 2007 a basic-income program which has been running for 16 years, and counting.

While IVR produces theoretically interesting contributions, whether a new construct, or a more traditional contribution (Lukka and Wouters, 2022), we have brought front and center another important characteristic feature of IVR projects, which is to have a practical impact in the community where the research is conducted, which is corroborated by our almost two-decade work on this topic, by shaping lives in various communities through basic-income programs.

Our activities with Children Aid and Development have taken researchers to many areas around the world. In the 2000s, few could have been predicted the future massive economic legal emigration from Romania, and its devastating impact on a new generation of future “orphans” with their parents being alive and well, in other parts of Europe, and starting new families abroad, and abandoning their children at home. Yet, direct observation and empiric data, plus some ill-fated economic reforms that further impoverished rural population, were the sign of the brewing storm of unprecedented economic exodus.

In 2007, persuaded by a local English teacher with good knowledge of the community, researchers started a basic-income program initially with a Roma family of four, two adults and two children. The goal of the program has always been to provide, ultimately, financial sustainability for the individuals, which adds to the overall financial stability of the family, as the individuals are part of their larger family unit, and ultimately part of their community. Ideally, the program goals would extend from individual to their family, then to the community-at-large, to the point of being at one point in time, “universal”, accessible to everyone. With the financial sustainability in mind (for the recipients, and the grantors alike), we devised an initially small program, with a few recipients, the youngest being in the 5th grade at the time. The length of the program was supposed to be at least 12 years, so the youngest recipients would have the means to graduate college, and beyond, if necessary.

This basic-income program derived from need, and the main problem for researcher was to quantify the respective need. The easy way is to give everyone the same amount, yet we knew from the community that not two people have the same needs. We wanted to tailor the program for each recipient, or at least category of recipients, people with common needs. Once the die is cast, and the recipients lined up, the flipside of not fulfilling the need was to introduce risk in our system. We thought in terms of quantifying risk, the risk of not doing anything, the risk of doing too little, the risk of changing nothing, or not enough. The right amount of money given on time equates better progress, less money, less progress, same money, later time, less progress. Hence, first step was to provide an amount based on the projected needs, then have the recipients to agree of asking themselves for more money when their funds are depleted. After a while, we were able to gauge a monthly amount that was appropriate for each recipient, for the time being. We budgeted unforeseen expenses as well, like certain books needed for school, clothes or uniforms for the first day of school, or for the winter season, an occasional laptop every few years, transportation costs during school season, college tuition, tutoring when necessary, or some unforeseen medical expenses, and so on. At times we undertook small health projects with recipients who were too shy to ask for dentist money, and their dental health was degenerating almost beyond repair. After a bit of health coaching, we convinced them to accept the extra funds, fix their teeth, and enjoy a better quality of life. Eventually, we convinced the grantees to bring up any extra expenses, so at least we can consider them, and decide on their timing. Thus, by knowing our recipients and developing good communication with them, we were able to fulfill their needs in the most optimal way, while building confidence and trust.

During the program, several areas of interest were closely monitored: *physical health*, *mental health*, *emotional health*, *trust* (in oneself, also in exogenous interventions from third party organizations), *goal setting*, and *goal reaching*, *scholastic progress*, *extracurricular activities*, *personal achievements* (other than scholastic), and the overall *financial stability* of the recipients over time, especially as a condition to exit the program. In noting and measuring results, researchers used an outsider and insider perspectives, etic and emic, for a better understanding of the program’s outcomes. For the purpose of this research, we have used terms emotional health and mental health interchangeably, although they are not, just in the sense that one validates the other.

Albeit long term, our basic-income program was still a temporary endeavor for each recipient, and it was extremely important to define beforehand the measure of success. In the end, in order to sustain the growing levels of need of our recipients, as well as manage the research’s finite budget (which was also never really set in stone), we had to respond to the following questions:

- **Need.** What are the needs to be fulfilled?
- **Fulfillment.** When is the need fulfilled? Punctually, how much one needs on an average month, how much to budget for emergencies in a contingent fund, and how much to be next year’s budget, given the fact that new recipients may exit, or enter the program. We were clearly aware that needs - especially of a growing person - are also growing, so researchers had to set up what we called a *progressive* UBI.
- **Unknown unknowns**. Aside from setting a contingency fund, what if there are needs that are not known to the researchers? Even the recipient may not know what they need, so despite the researchers’ best intentions, many of the needs may be still unmet.
- **Assessing progress**. How fast are the needs met/fulfilled? Generally, with school-age children, when graduating from the highest institution they decide (in conjunction with the program’s management) to graduate. However, there were situation when even after graduating, the recipients didn’t find a job right away, so they stayed in the program for a little longer, to fulfill the true purpose of a Universal Basic Income.

- **Measure of success.** When is the need really complete? Would the researchers be able to determine the program completion; would the recipient be lured by easy gains into staying longer in the program? (Luckily this was assessed properly by the recipients themselves, as their goal setting, *and* goal achieving capabilities, coupled with increased emotional intelligence, allowed them to evaluate their own progress quite accurately).

Based on the aforementioned settings, our little basic-income scheme became quickly a Progressive Universal Basic Income Program, where we have successfully used own progressive algorithms for the optimal financial stability of the recipients', and the program. It quickly grew towards 80 recipients.

The first notable observation, once the program started, was that the mere act of receiving something moves the needle quite well. The toughest challenges were to gauge how big is the need, whether is a "need" or a "want", and finally how much money to appropriate in order to really fulfill that need. The "nice-to-have" feature of any system is always the one that crashes the budget, so team had to draw a fine line between *needs* and *wants*. Luckily, our recipients were pretty good at doing this themselves. In the world of "wants", many of them were lacking basic needs, so we focused on that. Today's world is full of 'wants", so even the most astute researcher may have a difficult time to assess their own needs from wants.

Later on, while focusing on fulfilling the needs of the program's recipients, coupled with the inherent progress of each participant, created a new challenge of assessing, and constantly managing change. Next, we needed a way to measure the impact of the program, on the individual, on their family and friends, and overall, by his/her contribution to the society at large.

4. Measuring the impact

After being in the UBI program for close to a decade, many recipients have "graduated" successfully, while others who just started, are still in the program. Currently several recipients are already married, some with kids on their own. The basic-income stipend helped them through thick and thin, with no strings attached. Measuring the impact of basic-income programs must take into consideration several components. First, there's the impact of such exogenous interventions on the recipients themselves, then on friends and family, and the immediate community. Then, the impact of such program on the society at large.

4.1. Individual impact

The *individual impact* i.e., the subjective effect(s) felt by the individual, is often subjective, and describes the recipient's perception (could be coupled with his/her family, or friends' perception, for a more objective approach).

Name		**Smith, John**
Trust	In oneself	9.5
	In others	9
Health	Physical	9
	Emotional	10

Name		Smith, John
Goals	Setting	10
	Achieving	10
School		9
Extracurricular		10
Financial		10
Number of years in the program		11

4.2. Third-party impact

The *third-party impact* is the external observer perspective. It shows the immediate impact of the recipient to his/her group of peers, and family. The third-party effects have been captured externally, through ethnographic research, based on researchers' notes and observations, and semi-structured interviews of the recipient's family and friends. Our research is still assessing the perceived impact of the intervention on individual, while providing a new lens for determining the overall efficiency of the program.

4.3. Societal impact

The *societal impact* of such basic-income program cannot be underestimated, and can be properly quantified from many angles. First, the financial lens, a mere determination of how the individual will help the society through their earnings, by not being a burden on society. Then, *income taxes* on *salary*, also on *passive income*. There is also a certain amount of *disposable income* for each financially sustainable recipient that gets pumped back into the economy. There are the *charitable endeavors*, volunteering their time and/or their money for charitable purposes. *Higher levels of physical, emotional, and mental health* also mean less health-related issues, and these can be computed in an algorithm, to better understand the impact (or lack thereof) of healthier individuals on society. Social accounting (Bebbington, Brown, Frame, 2007), as well as blended value accounting (Nicholls, 2009) may present us with the right tools for measuring the impact of basic-income programs.

There are several important aspects of measuring the impact of basic-income programs on people's lives. First, the reluctance of the subjects of being measured, and having their lives reduced to a set of statistics, or to a conference topic. Besides a person's inherent need for privacy, constantly challenged during our days of social media dominance, we attribute their unwillingness to be measured to the persistent, pervasive (and much publicized), poverty stigma, which stymies the poverty eradication efforts. What is labeled as 'poverty' is not a disease, just a need, a deprivation, or a lack, waiting to be fulfilled. During our lifelong quest for a better society, and with an old adagio in mind, which states that 'what you resist, persists', we have shied away from focusing on 'poverty', yet put the emphasis on 'fulfilling the needs' and 'building skills and capabilities', instead. History clearly shows that 'wars on poverty' end up in Pyrrhic victories, with the first casualties being the very people that need to have their needs fulfilled, the most vulnerable ones. Changing the optics on poverty, albeit slightly, may very well be the much-needed game changer in our never-ending exploration of a better future.

The second matter with measuring the continuous and wholesome transformation of an individual may very well be the very act of measuring. The stream of researched framing constructs in performance measurements needs to take into account (and dispose of) the observer's relativity. Apart from this, social-income programs impact the lives of their recipients to a degree where the measurable output is impacted as well. Even a slight change in funding is creating ripples in people's lives, which makes measuring the impact of social-income programs akin to the Heisenberg's uncertainty principle - the relative precision of measuring two different factors, the position and the momentum (of a particle) at the same time. Once the precision in measuring one quantity is increased, the precision in measuring the other is diminished (Hilgevoord and Uffink, 2016). For this reason, a change in funding, or any other input parameters, which increases or decreases the momentum of a person's life, makes measuring the exact outcome more laborious, especially when at stake are multiple capitals, and multiple types of wealth, all being paramount to our research.

One surprising outcome arose out of our study: as diligent researchers, we have initially devised our own measure of success, for a recipient to "graduate" the program: possible complex calculations that may show that he/she are financially sustainable. Yet it turned out that we were slightly shortsighted, as each of our recipients told us beforehand about their need to exit the program, as they felt completely sustainable, and empowered by the outcome of the program. Their needs were fulfilled, they didn't need the program's financial stipend, and they added – invariable – that we can further offer the opportunity to another child in need. This was possible the biggest outcome of the program, knowing they all our graduates have developed strong emotional, mental, physical, and financial structures that they felt confident enough to be on their own. As a matter of fact, researchers never prodded anyone to exit the program, all the exits were voluntary. As such, none of the recipients stayed in the program more than necessary. As we have fulfilled their needs, they responded in-kind, and let us know as soon as their needs were fulfilled, and their goals met (which says a lot about the chosen metrics).

5. Case studies

One important thing that factored in to the success of the program is the fact that besides a stipend, the recipients have been through various programs to develop emotional intelligence, financial intelligence, goal-setting, goal-reaching, and they enjoyed a wide range of extracurricular activities, which allowed them to create inner structure in order to understand when their needs were properly fulfilled, and – most important – function on their own. Below are three case studies, each of the recipients have stayed in the program for an average of a decade. Aged 30 or less, currently they are accomplished human beings, and great contributors to the society.

5.1. Christian

Christian was born in a Roma family with great emotional and intellectual intelligence, and with limited material means. At 15, he was recommended to us by his English teacher; subsequently, Christian was the first recipient of the program. Having quite an impressive set of scholastic achievements, in STEM, but also in English, and History, he graduated from the prestigious Poly University of Bucharest with a degree in Computer Science. At that time, Christian moved from the countryside to Bucharest, where he volunteered extensively with non-profit organizations dedicated to helping impoverished Roma families. His background, his volunteer work, and other extracurricular activities gave Christian a good understanding of financial literacy, and he set lofty financial sustainability goals. Upon graduating from college, and being gainfully employed, he set a goal to save every month a percentage of his earnings. Soon after – alongside his fiancée - bought their first home, paid for completely in a mere four years. Immediately after, he and his now wife, purchased their second, investment home, and are on their way to earn a passive income, alongside their work-generated incomes.

Christian scored high on all fronts, with high marks in *trust* areas, both in oneself, and institutions (non-profits, corporations, and banks as well). His physical health has considerably improved during his time in the program. At 14, he had surgery for a possible malignant tumor, which turned out to be just a scare. Emboldened by his prior health challenges, he devised a *health and fitness program* for himself to lose weight and gain tone and energy, which he completed successfully. His *mental health* had improved, alongside his *emotional wellbeing*. His *scholastic progress* – which we closely monitored – has improved as well, and he found a job easily upon graduation, with Electronic Arts, a leading computer game publisher. From here, he moved to several consulting companies and tech giants, like Stefanini, Wipro, then Microsoft.
Armed with newfound qualities and achievements, he later met the girl who became his wife, and together have a very happy marriage. He *set goals*, and through diligent work, he built an *impressive portfolio of achievements*. Currently, Christian is happily married, and enjoying the financial stability he always wanted. After several successful engagements in information technology industry, Christian is working for United Nations, now passing the torch, and helping others fulfill their mission in life (*overall improvement from 6.278 to 8.899*).

5.2. Laurel

Laurel has entered in the program in her 9th grade. Unbeknownst to us, a couple of years prior entering the program, she was instrumental in identifying, then catching a thief who was stealing artefacts from Romanian monasteries. The head monk at the monastery where the thief was finally caught was so impressed with her display of intelligence, and prowess, that he recommended her (and her sister) to enter in our program.

Unlike most of our recipients, Laurel and her younger sister lived in the city. The upside, better exposure to information and possibly better public schools, better access to healthcare. The downside, higher cost of living, more pollution, and more health challenges. Her dad worked for the monastery, in a rural area, at rural area wages, so they were living below city living standards.

During high school, we encouraged Laurel to apply herself in sports as well, so she took on rifle shooting, an Olympic sport. Shortly after, she became the National Champion of Romania, Juniors and Seniors. Despite her success, and vastly improved physical and emotional achievements, her emotional state saw fluctuations. Shooting is a very demanding sport, with a lot of emotional pressure, and one needs to be extremely balanced and centered in order to achieve wider success. We worked with Laurel on improving her emotional fitness, and achieve more inner discipline. At the same time, she got admitted, and on her own academic merits, to the most prestigious business school in Romania, Faculty of Economic Cybernetics, Statistics and Computer Science, ASE Bucharest.

In this time of intense sports and academic competition, her financial needs grew, so the cash stipend was adjusted accordingly, to include food, clothing, college textbooks, as well as professional therapy, and necessary sports equipment. Her results have improved and became steady, to the point that Laurel started to win international medals on a regular basis. She is European champion in 2019 Air Rifle 10 m (individual event), and European Champion in 2018 with the team. Also, 3rd place in 2019 with the team at C.E. Also, Laurel won 1st place at the European Games Minsk 2019 Air Rifle Trial, 3rd place at the 2019 Air Rifle World Cup Final, 1st place at the World Cup in Munich, Germany, and 1st place at the World Cup in Guadalajara, Mexico. She still holds the European record in her discipline. Laurel represented Romania at Tokyo Olympic Games in 2020, where she ranked in top 10. She is by far the only Romanian woman athlete who has enjoyed this level of success in her sport.

Her achievements owe a lot to her newfound physical and mental fortitude, made possible with by a modest (at times) basic-income stipend. Laurel scored high on trust, health, goals, financial, and extracurricular activities. While she enjoyed success in college, her sports achievements far outscored her scholastic ones. Her sport achievements also brought Laurel financial stability, by having a stable job with the Romanian Police Force, and perks that came with winning international gold. We are looking forward to cheer for Laurel at the next Olympics in 2024, and inspiring new generations of women in sport *(overall improvement from 6.722 to 9.333).*

5.3. Gabriel

Gabriel was born in an impoverished family. His parents divorced early, and Gabriel was raised first by his father, who was still struggling with alcohol problems, then moved briefly with his mother, and during adolescence stayed with a family of neighbors. Not having a stable home left some emotional scars, but Gabriel was given outside emotional help and support during this time, and was able to cope well with his situation. He was very passionate about History and Geography, and applied himself in many other fields, during his years in a small school from a remote village, where he was shining brightly. However, being in an environment with virtually no competition, he had a lot to catch up during college, which he did with great effort and dedication. He chose to go to Law School, where he distinguished himself in many areas. He graduated in 2019 with a Law Degree from one of the most prestigious universities in Romania, and now he is clerking for a judge in Transylvania, while leading a team of professionals.

Gabriel is currently enjoying a stable stream of income from his job with the Romanian government administration, which it has given him the much-needed *financial sustainability*. Aside from his *academic achievements*, his *trust* levels had shown a significant boost since he entered the program, in the 5th grade. His *emotional and physical health* have vastly improved, his *goal setting and reaching* have been at highest levels since he understood the importance of our exogenous intervention. Recently, Gabriel moved in with his fiancée, soon to be his wife, and they are looking to start a family *(overall improvement from 6.167 to 8.222).*

Below is an example of assigned scores, and their powerful transformation experienced through the Universal Basic Income program:

Name		Christian	Laurel	Gabriel
Trust	In oneself	6.5	9	6
	In others	6	6.5	5.5
Health	Physical	6	9	7
	Emotional	7	7	7
Goals	Setting	5	5	6
	Achieving	5	5	6
School/Work		9	8	9
Extracurricular		8	7	6
Financial		4	4	3
AVG		6.278	6.722	6.167

Name		Christian	Laurel	Gabriel
Trust	In oneself	9	9	8
	In others	9	9	8
Health	Physical	8	10	8
	Emotional	9	10	8
Goals	Setting	9	9	9
	Achieving	9	9	9
School/Work		9	9	9
Extracurricular		9	10	7
Financial		9	9	8
AVG		8.889	9.333	8.222
Number of years in the program		9	9	10

6. Conclusions

In our research, we have analyzed what possibly counts as the longest running Universal Basic Income program created by a non-governmental organization. This is a social experiment running for more than fifteen years and counting. Aside from the obvious, measurable effects, we would like to emphasize the apparently intangible benefits of such programs, as the recipients have overwhelmingly shown improved mental health, emotional stability, trust and confidence, strong goal setting, as well as the concrete, tangible effects, like improved physical health, school grades, goal reaching in general, as well as financial stability, which shows how the impalpable effects translate to the real world, being properly monetized by the recipients. One important concept here is *building mutual trust, and confidence*, which in turn has built self-confidence for the recipients (Allas *et al.*, 2020).
Universal Basic Income recipients invariably score high on *improving mental (and emotional) health*, as well as *developing trust* in themselves, and institutions. This may be one of the most important conclusions here, as the trust in governments has been eroding considerably in the past years, and during the COVID-19 pandemic, and the decreased levels of mental health are impacting our society as we see it today.

The 2022 Edelman Trust Barometer Global Report is showing the private, and the voluntary sectors seen as ethical and competent, and effective drivers for positive change. The gap between these two sectors is seen as shrinking, showing the two sectors sharing more common goals, while the governments still have to catch up, at least in public perception.

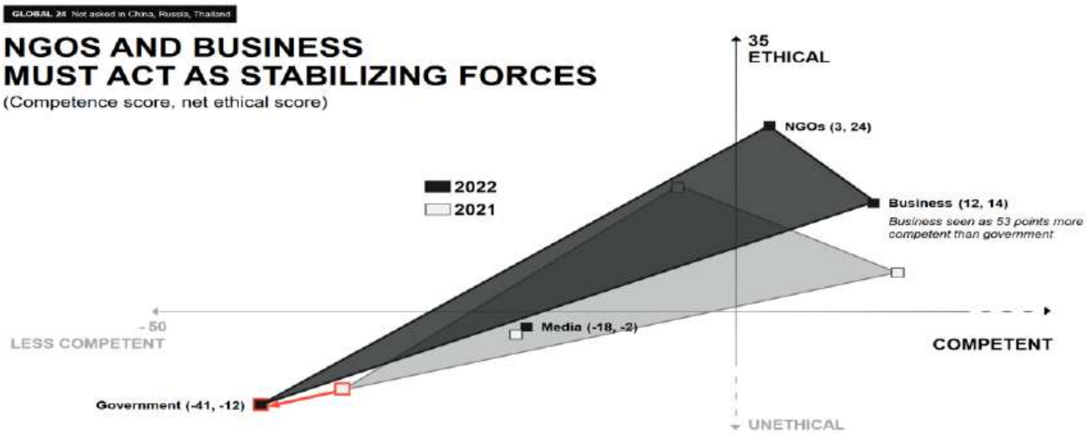

Figure 5. **The gap between the private and voluntary sectors is shrinking**
(Source: Edelman Trust Barometer Global Report, 2022*)*

What we see as a big drawback currently is the fact that UBI programs are mostly considered “experiments”. People’s lives, however, are not “scientific experiments”, and should be treated as such. A Universal Basic Income program needs to be considered a long-term endeavor which addressed the needs of the people until these needs are fulfilled.

Another important conclusion from our study is that, with proper training and education, the recipients of such program will develop inner structures that allow them to *function autonomously* and independently, as well as they can *define their own measure of success*, and “graduate” from the program, *without relying indefinitely on outside help*. The latter – alongside the poverty stigma - seems to be the biggest impediment of defining and implementing successful long term basic-income programs.

UBI is not only for people who are unemployed, or considered “poor” and “destitute”. Vulnerability comes at many levels, and post-COVID emotional and mental health is one of them. We live in an increasingly disconnected world, and UBI programs build connections, and trust. With many economies slashing welfare, and health programs, basic-income programs need to carefully consider mental and physical health vulnerabilities of their future recipients, and extend the program beyond considering income as the main eligibility factor.

Basic-income programs need to be *indiscriminate in nature, not in monetary value*. Different people, even from the same family, have different needs. In order to see a meaningful impact, instead of writing a blank check to everybody, a true UBI program needs tailored for the monetary needs of the recipients. Within the same community there are different needs, as well. Before starting any successful basic-income program, there’s a need for a *careful assessment* of each recipient, at various levels (shown in our study), then the monetary quantum allocated needs to be established appropriately from individual to individual, coupled with *non-monetary incentives*, like financial literacy programs, emotional and mental health support, and more that’s needed.

Another important aspect for a meaningful impact is to consider the *growing needs* of the individuals, as they literally grow physically and emotionally, especially children.

One important consideration to UBI programs is the fact the recipients' level of trust increases, whether in authorities, in organizations, or increases the bonds within the members of the community. The need to feel supported, and the confirmation of such support, can fulfill the needs of many UBI recipients not on a regular basis, but punctually. Circling back to the four types of poverty, there are people in constant need, and people in occasional need, and the level of basic-income offered to them is not only different, but offered at different times in their lives.

6.1. Removing the stigma on poverty

Tackling the multidimensional poverty requires a Weberian analytic lens, and a multidimensional approach to social stratification. In order to avoid the stigma of handouts for children and their families, researchers advertised the basic-income as a "merit scholarship", although there were no scholastic criteria in the program. The "merit scholarship" construct instilled a sense of appreciation among the young, and pride among their parents. This was a way to help the recipients of the program, without them feeling the least humiliated, or have their self-esteem suffer in any way.

We noticed early in our approach that poverty-associated shame, and its subsequent emotional scars, could become serious impediments in setting up (and running) proper basic-income programs. Whilst most onus has been narrowly placed on the material condition of poverty, this condition further needs to be viewed as a potentially damaging social relationship where the prevailing norm is marginalizing people perceived as 'poor' from 'mainstream' society. Moreover, poverty has been reframed for decades as a problem solely of the 'poor' themselves, rather than a byproduct of social relations characterized by inequalities of wealth (Lister, 2003). Experiences of stigma and shame are central to the disparaging process of poverty, which serve to regulate relationships between 'the poor' and the wider society, including daily social interactions, wider social representations of poverty and 'the poor' in everyday social exchanges, and public and media discourses on poverty (Sutton *et al.*, 2014). Reframing poverty as a condition of individuals with needs that are yet unmet may contribute to a better understanding of the problem, and a better solution, from which basic-income programs can greatly benefit.

In alleviating poverty, we looked at monetary poverty and into growing the financial capital. Also, we have looked into the nonmonetary poverty criteria such as health, education, social security, and housing, and their equivalences in other capitals such as human capital, intellectual, social and relationship capital, as well as the manufactured, or the natural capital. Multidimensional poverty needs to be tackled from all sides, as an investment in growing each form of capital. Poverty is a condition that needs to be assuaged, period. The condition of being deprived of three social rights and having per capita income below the extreme poverty line, also called *extreme multidimensional poverty*, it is shared – according to United Nations (2022) by 1.2 billion people, or 15% of our world population, in 111 developing countries. This only makes fulfilling people's needs more urgent. Ideally, their needs have to be met before the cycle of poverty deepens, and before more people fall into poverty. Our interventions targeted individuals who, on the surface, were 'only' cyclically, or usually poor. Yet during difficult economic times, when rich get richer, poor get poorer, and the fine line to extreme poverty gets crossed imperceptibly, yet definitively.

In our basic-income program, researchers attempted to fulfill the needs of a various population categories, from school age, to almost retirement age. The diversity and range of the needs to be fulfilled called for a variety of measures and answers, tailored for each recipient. This is just another criteria making this particular Universal Basic Income program unique in the world.

6.2. Reframing the UBI

There is a distinct possibility that 'universal' in Universal Basic Income to constitute a statement that conditions an egalitarian concept of distributing equal sums of money to the UBI programs recipients. However, no two people have identical needs. As difficult as it seems to be gauging people's needs, this is highly required in order to ensure correct measurements of the needs, and the impact of the program in fulfilling these needs.

Researchers have determined a need for refining and reframing the Universal Basic Income concepts, like emphasizing the various, and progressive needs of its beneficiaries. Further considering the fact that a family living together is intrinsically united, and not formed by disconnected individuals, the UBI needs to apply to individuals living alone, or to families living together, equally. This is not a new concept: Chicago School economist George Stigler argued in 1946 for a family-based grant instead of an individual-based grant, combined with supplementary in-kind benefits used on the side (Lehto, 2018).

Henceforth, the UBI concept could (and should) become altered to *include family structures, households, and implicitly all citizens, regardless of age, in necessary amounts, which can be altered as needed.*

There are more ways of rethinking the basic-income concepts, by considering new constructs that express slightly improved notions, for equally improved perceptions. As an example, in the light of reframing the poverty concept itself through the lens of fulfilling of certain (basic) needs, and based on the aforementioned studies showing great improvements of individuals in social-income programs, the Universal Basic Income can be rethought as an 'Universal Basic Achievement' of all the individuals impacted by the program.

A decade-old Princeton study on the effects of extra earnings on individual fulfillment, show that the effects of income on the emotional dimension of well-being satiate fully at an annual income of ~$75,000, following the principle of adaptation (Kahneman and Deaton, 2010). Being aware of the transient pleasure in a sudden income raise, researchers had to look for additional motivating factors in the areas of personal achievements, making UBI more closely linked to long-term, overall wellbeing. For the individuals scoring high on 'Universal Wellbeing Achievements', UBI became *de facto* 'Universal Wellbeing Income'.

The interventionist researcher has decided to tackle the cycle of poverty through education, proper healthcare, and financial sustainability opportunities. Poverty needs to be viewed the same way as a pandemic that needs a cure at the global level, rather than an individual problem pertaining to the ones deemed as 'poor', yet the cure needs to be tailored more or less on the individual.

Reframing the concept allows for creating better baselines, a better way of measuring the needs, and means to fulfill these needs in a more impactful way. This in turn drives the creation of a more powerful (and meaningful) set of tools for assessing these needs, to meet the demand in a proper manner. It removes the stigma on poverty, and focuses on people's needs, it separates the needs from wants, and creates a better framework for lifting 1.2 billion of the world's poorest out of poverty, towards normal and decent living conditions.

References

Allas, T., Maksimainen, J., Manyika, J., Singh, N. (2020) An experiment to inform universal basic income, available on-line at https://www.mckinsey.com/industries/social-sector/our-insights/an-experiment-to-inform-universal-basic-income

Alkire, S., Apablaza, M., Chakravarty, S. R., & Yalonetzky, G. (2017). Measuring chronic multidimensional poverty. *Journal of Policy Modeling*, vol. 39, no. 6: 983-1006. https://doi.org/10.1016/j.jpolmod.2017.05.020

Apostol, O., Mäkelä, H. & Vinnari, E. (2023) Cultural sustainability and the construction of (in)commensurability: cultural heritage at the Roşia Montană mining site, *Critical Perspectives on Accounting*, 102577, 10.1016/j.cpa.2023.102577

Baard, V.C., & Dumay, J. (2020) *Interventionist Research in Accounting: A Methodological Approach* (Routledge Studies in Accounting) (1st ed.): Routledge.

Bebbington, J., Brown, J., & Frame, B. (2007) Accounting technologies and sustainability assessment models. *Ecological Economics*, vol. 61, no. 2–3: 224-236, https://doi.org/10.1016/j.ecolecon.2006.10.021

BIEN, 2023. Available on-line at https://basicincome.org/

Caamal-Olvera, C.G., Reynoso, L.H., & Rembao, L.I.L. (2022) Universal basic income: A feasible alternative to move people out of poverty in Mexico? *Journal of Policy Modeling*, vol. 44, no. 5: 1077-1093, https://doi.org/10.1016/j.jpolmod.2022.07.005

Callon, M., & Law, J. (2005) On Qualculation, Agency, and Otherness, *Environment and Planning D: Society and Space*, vol. 23, no. 5: 717-733, https://doi.org/10.1068/d343t

Callon, M., & Muniesa, F. (2005) Economic markets as calculative collective devices *Organization Studies*, vol. 26, no. 8: 1229-1250, doi: 10.1177/0170840605056393

Concern Worldwide US. (2022). *Concern Worldwide*, available on-line at https://www.concernusa.org/what-we-do/cycle-of-poverty/

Cuckston, T. (2022) Accounts of NGO performance as calculative spaces: Wild Animals, wildlife restoration and strategic agency, *Critical Perspectives on Accounting*, vol. 84: 102374, https://doi.org/10.1016/j.cpa.2021.102374

Defourny, J., & Nyssens, M. (2006) *Defining Social Enterprise*. In M. Nyssens, *Social Enterprise: At the Crossroads of Market, Public Policies and Civil Society* (1st ed., pp. 3-27). Routledge.

Duclos, J., Tiberti, L., & Araar, A. (2013) Multidimensional Poverty Targeting, CIRPEE Working Paper 13-39, available on-line at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2349771, https://doi.org/10.2139/ssrn.2349771

Edelman Trust Barometer. (n.d., 2022). Edelman, available on-line at https://www.edelman.com/trust/2022-trust-barometer

Eurostat. (2017) Eurostat celebrates Romania, available on-line at https://ec.europa.eu/eurostat/en/web/ products-eurostat-news/-/edn-20171201-1

Freeman, E.R. (2010) *Strategic Management: A Stakeholder Approach*, Cambridge University Press.

Hilgevoord, J., & Uffink, J. (2016) *The Uncertainty Principle*, *The Stanford Encyclopedia of Philosophy*, available on-line at https://plato.stanford.edu/entries/qt-uncertainty/

Johnson, A.K., & Groze, V. (1994) The Orphaned and Institutionalized Children of Romania. *Journal of Emotional and Behavioral Problems*, no. 2: 49-52.

Kahneman, D., & Deaton, A. (2010) High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences*, no. 107: 16489-16493.

Lehto, O. (2018) *Basic Income Around the World: The Unexpected Benefits of Unconditional Cash Transfers*, Adam Smith Institute.

Lister, R. (2003) *Poverty*, Cambridge: Polity Press.

Lukka, K., & Wouters, M.J. (2022) Towards interventionist research with theoretical ambition, *Management Accounting Research*, vol. 55: 100783, https://doi.org/10.1016/j.mar.2022.100783

Maldonado, M.I.G., & Corbey, M. (2016) Social Return on Investment (SROI): A review of the technique, *Maandblad voor Accountancy en Bedrijfseconomie*, vol. 90, no. 3: 79-86, https://doi.org/10.5117/mab.90.31266

McCulloch, M., & Ridley-Duff, R. (2019) *To profit or not to profit? That is the wrong question*, In: 7th EMES International Research Conference on Social Enterprise, Sheffield, 24-27 Jun 2019, available on-line at https://emes.net/publications/conference-papers/7th-emes-conference-selected-papers/to-profit-or-not-to-profit-that-is-the-wrong-question/, EMES International Research Network

Nicholls, A. (2009) 'We do good things, don't we?': 'Blended Value Accounting' in social entrepreneurship, *Accounting Organizations and Society*, vol. 34, no. 6–7: 755-769, https://doi.org/10.1016/j.aos.2009.04.008

Nicholls, A. (2010) The Institutionalization of Social Investment: The Interplay of Investment Logics and Investor Rationalities, *Journal of Social Entrepreneurship*, vol. 1, no. 1: 70-100, https://doi.org/10.1080/19420671003701257

O'Dwyer, B., & Unerman, J. (2008) The paradox of greater NGO accountability: A case study of Amnesty Ireland, *Accounting Organizations and Society*, vol. 33, no. 7-8: 801-824, https://doi.org/10.1016/j.aos.2008.02.002

Power, M. (1996) *The audit explosion*, London: Demos

National Audit Office – NAO (2022) Successful commissioning toolkit. What are third sector organisations and their benefits for commissioners? available on-line at https://www.nao.org.uk/successful-commissioning/introduction/what-are-civil-society-organisations-and-their-benefits-for-commissioners/

Sen, A. (1999) *Development as Freedom*, New York: Alfred Knopf, p. 87

Sutton, E., Pemberton, S., Fahmy, E., & Tamiya, Y. (2014) Stigma, Shame and the Experience of Poverty in Japan and the United Kingdom, *Social Policy and Society*, vol. 13, no. 1: 143-154, https://doi.org/10.1017/s1474746413000419

United Nations. (2022) *2022 Global Multidimensional Poverty Index (MPI). Human Development Reports*, available on-line at https://hdr.undp.org/content/2022-global-multidimensional-poverty-index-mpi#/indicies/MPI

Ureche, A. (2022) The role of third sector organizations in creating collaborative socio-economic development frameworks in rural areas. In *International Scientific Conference IFRS: Global Rules and Local Use – Beyond the Numbers* (10th ed.). Metropolitan University Prague, Anglo-American University, Prague.

Vîlcea, C. (2014) Differences in the socio-economic development of the rural space in the south-west Oltenia development region, *Romanian Review of Regional Studies*, vol. X, no. 1: 89-96

World Bank Group (2022) *Fact Sheet: An Adjustment to Global Poverty Lines. World Bank*, available on-line at https://www.worldbank.org/en/news/factsheet/2022/05/02/fact-sheet-an-adjustment-to-global-poverty-lines

World Bank Group (2023) *Poverty. Overview*, available on-line at https://www.worldbank.org/en/topic/poverty/overview

World Population Review (2023) *Countries with Universal Basic Income 2023*, available on-line at https://worldpopulationreview.com /country-rankings/countries-with-universal-basic-income

Kaplan, R.S. & Norton, D.P. (2004) How strategy maps frame an organization's objectives, *Financial Executive*, vol. 20, no. 2: 40-45

Trend of Sustainability Indicators in Russian Energy Companies

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Abstract: *The conflict between Russia and Ukraine, the energy crisis, the increase in energy prices, and the worries about how energy use will affect climate change make the topic of energy more interesting. The first question of this research is: What is the trend of sustainability indicators in Russian energy companies? For answering the question, we used sustainability reports, from 2021 of three Russian companies in the energy field: Gazprom, Rosneft, and Lukoil. The companies selected for our study are very important not just for Russia, but for entire energy field, because those tree companies are in a top 15 of Leading oil and gas companies worldwide based on net income as of 2022, more precisely Gazprom is on the first place, Rosneft on the seventh place and Lukoil on the nineth place* (Statista, 2023). *From the sustainability reports we extracted several important sustainability indicators that reveal if the evolution in time is positive, meaning less harmful for the environment, or negative, meaning more harmful for the environment compared to the previous year. The findings reveal that, overall, in 2021, the adverse effects on the environment were less pronounced than in 2020. The significance of this paper is to explore the progress of the transition to a clean environment from a sustainability perspective using indicators from sustainability reports. This paper offers an in-depth review of the indicators used in corporate sustainability reports by companies in the energy field.*

Keywords: *Sustainability indicators, sustainability reports, trend, energy, Russia.*

1. Introduction

Since the war between Ukraine and Russia came with many issues for Europe, the oil, gas, and in general energy subjects become more important since Russia is a big supplier. This war generated increased ambitions and reinforced policies in Europe to accelerate clean energy transitions and reduce reliance on fuel imports. Starting from the information that oil and gas extraction was higher in 2021 than it was in 2020, we are wondering what impact it has on the environment. The first study question is: What is the current trend of sustainability indicators in Russian energy companies? For our purpose we used sustainability reports from three Russian energy corporations, Gazprom, Rosneft, and Lukoil. Those tree companies chosen for our study are critical not only for Russia but for the worldwide energy sector. We selected numerous critical sustainability indicators from the sustainability reports that reflect whether the development in time is positive, meaning less damaging to the environment, or negative, meaning more harmful to the environment in comparison to the previous year. The data show that, overall, the negative effects on the environment were less pronounced in 2021 than in 2020.

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Energy markets started getting tighter in 2021 due to an array of circumstances, including the unusually swift economic recovery following the pandemic, but this situation deteriorated dramatically with the war between Russia and Ukraine in February 2022, resulting in a full-blown global energy crisis (IEA – International Energy Agency, 2022).

Even when businesses adhere to the strictest GRI guidelines and use assurance practices, a study of the environmental reports of businesses operating in environmentally sensitive sectors revealed that disclosed data are frequently ambiguous and inconsistent with GRI standards (Turzo *et al.*, 2022). The financial crisis and its detrimental repercussions on the world economy generated a need for transparent corporate reporting (Dragu and Tiron-Tudor, 2013), from both financial and nonfinancial reporting. Clearly, climate change is strongly linked to the chosen paradigm of sustainability, the time frame of the future energy system, and energy needs (Belyakov, 2019).

2. Literature review

2.1. Sustainability reporting

Beginning with the fiscal year beginning January 1, 2017, organizations situated in the European Union must comply with the European Directive 2014/95/EU on the publishing of non-financial and diversity information by certain important enterprises and groups (Dumitru *et al.*, 2017). Nonfinancial reporting is the manner by which a company informs stakeholders about the social, environmental, and economic implications and performance of its past and current operations (Milu and Hategan, 2021). Even though conciseness is a general property of auditors' opinions stated through audit reports, in the case of non-financial data, a more extended form of the assurance report can help improve report dependability, given the absence of obligatory reporting standards (Dumitru and Gușe, 2016). An informative non-financial report should cover both good and negative influence on the environment where the firm is headquartered, the company's environmental and social statistics, and the link to sustainable development (Nichita *et al.*, 2020). The reports prepared by the economic entities during the pandemic period, will serve a dual purpose: the public ones, which aim at financial and non-financial reporting, will help increase investor confidence in what the trades shares, and the confidential ones, which are intended for management, will assist in making relevant decisions (Calu and Nichita, 2020).

Companies that wish to adopt the IIRF or the GRI 4 should keep in mind that certain information must be present in their reports in order to be compliant with the Directive's requirements, more precisely, if the company adopts the GRI 4, managers should be aware of the need to include information on the business model and on the Respect of Human Rights, and if the company has adopted the IIRF, detail on Policies and Due Diligence and on anti-corruption (Manes-Rossi *et al.*, 2018). In accordance with the Global Reporting Initiative (GRI), Sustainability Reports are practices of measuring, disclosing, and being accountable to internal and external parties for business performance toward the sustainable development objective (Eugénio *et al.*, 2022). Worldwide, there have been a number of bankruptcies as a result of poor governance and disclosures (Buallay and AlDhaen, 2018). Different audiences, especially stakeholders who need to make more informed business decisions, are interested in the non-financial information offered by companies from various economic sectors (Bartoszewicz and Szczepankiewicz, 2022). Non-financial reporting's content is still developing; thus, it needs to be clarified in terms of information perimeter, data measurement, analysis, and audit (Bychkova *et al.*, 2022). There is a lack of research on auditing professionals' perspectives of non-financial reporting and its assurance, and the most of those studies give limited focus to the assurance component (Eugénio *et al.*, 2022).

Despite the fact that the topic of non-financial information reporting first developed in the 1970s, 90% of the publications have been published in the last decade, indicating researchers' interest and the topic's growing importance in the recent 10 years (Grueso Gala and Camisón Zornoza, 2022). Non-financial reporting differs from financial reporting in a few ways: its introduction is required depending on whether the firm serves the public interest, as well as its subject matter includes economic indicators but also social ones (Filyppova *et al.*, 2021). All businesses should place a high priority on respecting and caring for the environment as they conduct themselves as ethically responsible corporate entities in accordance with the principles of sustainable development founded on environmental protection, respect for others, and the desire for future generations to be able to equally benefit from the planet's natural resources that are maintained in good condition (Artene *et al.*, 2020). Understanding how the planning techniques employed in monopoly must evolve to take the new deregulated environment into account is becoming more and more important as more utility markets are deregulated and competition is introduced (Dynera and Larsen, 2001). In the EU's internal market, the wholesale price of electricity is directly related to the price of gas, which is largely imported (Council of the European Union, 2022). EU countries are working together and closely coordinating their efforts to safeguard the EU's energy supply and limit the impact of high energy prices on consumers and the economy (Council of the European Union, 2022). The European Union (EU) Action Plan on Financing Sustainable Growth (2018) and the EU Green Deal (2019) are both aimed at developing a common taxonomy and ensuring a more accordant flow of standardized information from enterprises to shareholders and other parties involved (Kateifides, 2022). On average, non-financial disclosure raises the value of the company (Chauhan and Kumar, 2018). Lungu *et al.* (2016) included in their investigation 186 papers published by Romanian authors, i.e., 155 articles published by Romanian writers in worldwide databases and 31 articles published by Romanian writers in Thomson Reuters indexed journals published between 2011 and 2015, demonstrating a high level of interest in CSR (corporate social responsibility) issues in the mentioned period (Lungu *et al.*, 2016). CSR practices are applied in 2018, by a large number of BSE-listed firms in a variety of economic sectors, and companies are encouraged to reconcile social and environmental duties with profit via social responsibility (Simionescu and Dumitrescu, 2018).

The preparation of CSR reporting relies heavily on the unique expertise of its authors for both quality and improvement (Gușe *et al.*, 2016). The triple bottom line (TBL) concept asserts that it is a reporting mechanism that aims to motivate firms to pay more focus on the overall impact of their commercial activities rather than simply their financial results (Robins, 2006). The inclusion of social effect in different measurement methods is insufficient, and the Triple Bottom Line idea offers little to improve the measurement of social bottom lines (Sridhar, 2012). Overseas investors prefer to invest in firms that provide more ESG-related disclosure, particularly disclosure linked to firm-level governance, but local investors, who possess a relative informational advantage over foreign investors, react less to ESG-related disclosure (Chauhan and Kumar, 2019). Due to its integrated reporting framework, which defines it as a "best in class" nation for NFR, South Africa offers a different empirical context (Stolowy and Paugam, 2018). Growth companies and index constituents in the United States are less likely to report CSR/sustainability data, whereas firms in the European stock index that operate in environmentally sensitive industries, have high capital intensity and good CSR performance, are bigger and have better financial results are more likely to do so (Stolowy and Paugam, 2018). Disclosure could reduce a company's cost of capital through a variety of channels, resulting in higher share value and faster growth (Refait-Alexandre *et al.*, 2009). National governance packages enable businesses to emphasize or de-emphasize specific internal governance capabilities based on external governance processes provided by national institutional elements (Kim and Ozdemir, 2014).

While social and environmental accounting research has a long history in accounting, the EU Directive on NFR opens the door to new practice-driven opportunities to develop accounting research (La Torre *et al.*, 2020).

Accountability is an important element for creating trust in the context of corporate reporting and is emerging as a common theme connecting recent research on the EU Directive (La Torre *et al.*, 2020). As previous evidence indicates that few enterprises report on sustainability risks and policies, and the ones that do report do not reveal complete, trustworthy, and comparable details that partners consider appropriate, the European Commission proposed a Corporate Sustainability Reporting Directive in 2021 (Eugénio *et al.*, 2022).

Less than half of managers (45%) intend to introduce new ESG funds, despite the fact that in the year 2022 almost nine out of ten institutional investors (88%) think asset managers ought to be more proactive in improving new ESG products (PwC, 2022). The enterprise can change information to create it complicated for stakeholders to utilize by creating it too vast or sophisticated (Refait-Alexandre *et al.*, 2009). Greenhouse gases are those that retain heat in the atmosphere (EPA-United States Environmental Protection Agency, 2023). According to Dumitru *et al.* (2017), past regulation, local institutional features, ownership, industry, and auditors all influence the quality of non-financial indicator disclosures.

2.1. Energy

Even if energy is never used outside of a particular context or activity, a lot of research and analysis is supported by the discursive technique of treating it like a significant topic in and of itself (Shove and Gordon, 2014). In recent years, energy consumption analysis has been important to the political and economic debates on climate change and global warming (Pablo-Romero *et al.*, 2022). In 2019, energy accounted for 77.01% of greenhouse gas emissions, with transportation making up over a third (European Environment Agency (EEA), 2018).

Oil exploration through to garage forecourt operation, traffic control, and driving itself all require the continuous, relatively faithful reproduction of a whole set of variably interconnected processes (Shove and Gordon, 2014).

It appears to be a self-evidently sensible area that can be safely followed without worrying about causing a hornet's nest of uncomfortable questions about the sustainability or otherwise of current constellations of practice (Shove and Gordon, 2014).

In 2021, Russian natural gas imports via pipeline and LNG (liquified natural gas) amounted for about 40% of total EU natural gas consumption (BP, 2022). In 2021, Russian oil imports accounted for 25% of total EU imports and Russian coal imports will account for 20% of total EU coal energy consumption (BP, 2022).

Due to the significant slowdown in economic activity, global greenhouse gas emissions decreased in 2020 by around 4,5 percent compared to 2019, releasing the equivalence of 50 billion tons of carbon instead of 52 billion (Gates, 2021). The project of convincing people to meet current needs with fewer resources is one that can be applied to all situations (Shove and Gordon, 2014).

Russia and Ukraine, the two biggest members of the Commonwealth of Independent States, in 1996 used 83% of the main energy source for the area (Eberhard *et al.*, 2000).

Steam power, followed by electricity and gas, replaced traditional fuels including wood, candles, and animal power, so this decreased the chance of fires, improved indoor air quality and increased house comfort during the winter, and it also decreased the risk of health risks related to animal excrement (Wilkinson and Markandya, 2007). Globally, substantial differences in energy usage between rich and developing countries must be addressed in the coming years, with connected effects on water use (Gleick, 1994).

3. Research questions and aims

Due to global dependency on Russian energy and the fact that the rising prices of energy affected all activities, including daily activities of people. The motives for the second research question emanates from the topic of the development of alternative ways to obtain energy, ways that are less harmful to the environment. The research question is: What is the trend of sustainability indicators in Russian energy companies? The purpose of this paper is to see if the adverse effects on the environment are less or more pronounced from one year to another.

4. Research methods

The data came from a content analysis of annual sustainability reports of companies analyzed. Our study is a "two-wave longitudinal study", and it entails gathering data from the sustainability indicators at two distinct moments in time. For this retrospective study, we collected data from moment 1, the year 2020, and moment 2, the year 2021.

The descriptive research method was used. Secondary data is collected to analyse the trend of sustainability indicators. The sources for sustainability indicators of the companies included in this paper were the sustainability reports for 2021 from all 3 entities. Descriptive research statistics were employed in the study to evaluate and comprehend the existing level of corporate involvement in reducing their negative environmental effects. We used sum, percentage, and mean to analyse the research questions. We calculated percentages from two points in time, 2021 with 2020, for comparing how the data has changed over this period. This helped us identify trends between the variables being measured.

We compared the sustainability indicators for the year 2021, with those for the previous year, 2020. We measured and compared the following sustainability indicators: Total environmental protection expenditures (RUB million), Waste generation (tons), Pollutant emissions (tons), Water discharge into surface water bodies (million cubic meter), CO2 equivalent GHG emissions (million metric tons) and Green investments (RUB million).

5. Research results and discussions

The information from subchapters 5.1, 5.2, and 5.3 is collected from the enterprises' websites.

Based on net income of 2020, the leading oil and gas companies worldwide are: on the first place Gazprom from Russia, on the second Petrobras from Brazil, on the third place is Exxon Mobil from the US and on the fourth place is Shell from the UK. The company Rosneft is in seventh place and Lukoil is in nineth place.

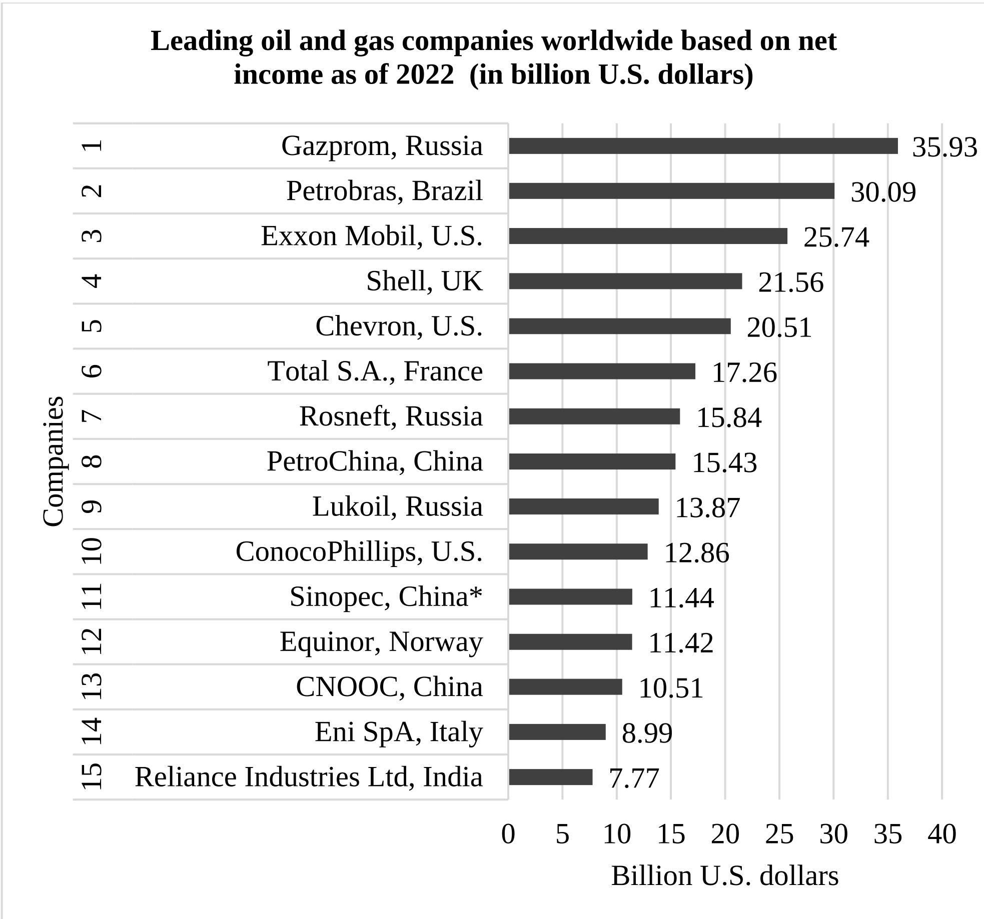

Figure 3. **Leading oil and gas companies worldwide based on net income as of 2022 (in billion U.S. dollars)**

(*Source*: Statista, 2023; author's research)

5.1. Gazprom

Gazprom's operations include all forms of exploration, drilling onshore and offshore wells, producing, processing, and transporting hydrocarbons, building and upgrading oil & gas facilities, developing the market for natural gas or vehicles, and building and upgrading oil & gas facilities.

The business was founded in 1998 as a joint venture between Gazprom, Zarubezhneft, and Stroytransgaz called Zarubezhneftegaz to develop their interests in international projects. After purchasing the partners in 2007, Gazprom changed the name of its 100% affiliate to Gazprom Zarubezhneftegaz JSC and began conducting business in Venezuela, Central and Southeast Asia, India, on behalf and in the name of Gazprom. Incorporated in the aforementioned nation the same year (2007), Gazprom Netherlands B.V. additionally served as Gazprom's external representative in areas where Gazprom Zarubezhneftegaz was not active. Due to this, the same work was eventually performed by two essentially separate businesses.

It was obvious in the late 2000s that Gazprom's project operations overseas needed to be organized by creating a single dedicated company. It was intended to take on the necessary financial, professional, and technological capacity to execute upstream projects abroad and to offer single-window lean management. The decision to transfer this obligation to Gazprom P International was taken on February 4 of that year. This was followed by a three-year merger between Gazprom P International and Gazprom Zarubezhneftegaz.

At present, nearly 40 projects of different sizes are being worked on by Gazprom EP International, which works in nearly 200 countries on three continents. The major initiatives are located in Algeria, Bangladesh, Bolivia, Libya, Uzbekistan, Vietnam, and the UK, Danish, and Dutch North Sea regions. The business is currently in discussions to start initiatives in a number of other nations.

The main duties and goals of Gazprom EP International include ownership and management of subsidiaries engaged in prospecting, exploring, and developing hydrocarbon areas outside the Russian Federation; looking for, analyzing, and purchasing new petroleum assets in the majority of oil and gas producing regions of the world; handling projects and keeping an eye on operational activities; and representing Gazprom prior to overseas private and state-owned petroleum firms (Gazprom, 2023).

Electricity and heat energy revenue of Gazprom worldwide

The revenue of Gazprom from electricity and heat energy increased by 24% from 2016 to 2021, more precisely with 113.8 billion Russian rubles, from 481.70 in 2016 billion Russian rubles, to 595.50 billion Russian rubles in 2021 (Statista, 2023).

For Total environmental protection expenditures, Gazprom had an increase of 5% in 2021 compared to 2020. From waste generation, the impact was positive compared to 2020, with a decrease of 6 %. For Pollutant generations there was a negative impact compared to 2020, with an increase of 2 %. For water discharge into surface water bodies, the impact was negative with an increase of 24%, compared to 2020. For CO2 equivalent greenhouse gases (GHG) emissions the impact was negative, compared to

2020, with an increase of 16%. For Green investments, the impact was positive with a huge increase of 433%.

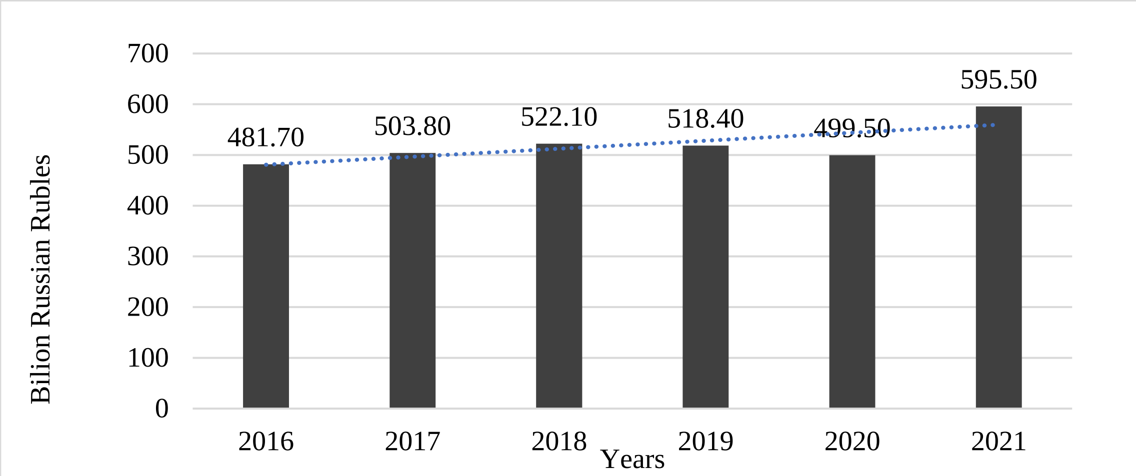

Figure 4. **Electricity and heat energy revenue of Gazprom worldwide from 2016 to 2021 (in billion Russian rubles)**
(*Source*: Statista, 2023)

Table 1. **Gazprom indicators**

Gazprom sustainability indicators	2020	2021	% Change	Net Effect	Impact
Total environmental protection expenditures (RUB million)	34,441	36,303	105%	1,862.59	Positive
Waste generation (tons)	3,229,830	3,046,590	94%	-183,240	Positive
Pollutant emissions (tons)	2,445,660	2,506,310	102%	60,650	Negative
Water discharge into surface water bodies (million cubic meters)	2,611	3,225	124%	614.66	Negative
CO_2 equivalent GHG emissions (million metric tons)	210.3	243.3	116%	32.96	Negative
Green investments (RUB million)	13,987.2	60,529.6	433%	46,542.42	Positive

(*Source*: Gazprom, 2022; author's research)

5.2. Rosneft

The largest publicly traded oil firm in the world and the leader of the Russian oil sector is Rosneft. It contributes 6% to the world's oil production. Hydrocarbon prospecting and exploration, oil, gas, and gas condensate production, offshore field development projects, refining, and sales of petrochemicals in Russia and abroad are among the company's primary activities. The Company is listed among Russia's strategic businesses. BP Russian Investments Limited owns 19.75% of its shares, QH Oil Investments LLC owns 18.46%, and the Federal Agency for State Property Management owns one share on behalf of the state, which is represented by ROSNEFTEGAZ JSC, the company's largest shareholder with 40.4% of the company's shares. The Company's main goals and objectives are to develop hard-to-recovery oil reserves, produce efficiently from mature fields, increase production through new projects in Eastern Russia, increase gas production through a highly effective long-term sales portfolio, and increase margins across the entire value chain. One of the biggest independent gas producers in Russia.

The history of the domestic petroleum sector and Rosneft Oil Company are intimately linked. The enterprises were first mentioned as being a part of Rosneft at the end of the

19th century. For instance, the investigation of Sakhalin's oil fields began in 1889. When new oil and gas resources were being fully developed in the Soviet era, Rosneft Oil Company's fundamental assets were set up. The majority of the petroleum business was privatized in the 1990s. The state enterprise Rosneft, which was reformed in September 1995 as Open Joint Stock Oil Company Rosneft, had been in charge of managing the petroleum assets that were still under state control. In terms of oil production volume, Rosneft led the Russian oil companies in 2005 with a total output of 74.6 million tons. Stocks of Rosneft were initially listed on the London Stock Exchange in 2006 (Rosneft, 2023).

Table 2. **Rosneft sustainability indicators**

ROSNEFT sustainability indicators	2020	2021	%	2021-2020	Impact
Total environmental protection expenditures (RUB million)	31,428	31,177	99%	-251	Negative
Waste generation (tons)	15,197,000	5,849,000	38%	-9,348,000	Positive
Pollutant emissions (tons)	1,521,000	1,341,000	88%	-180,000	Positive
Water discharge into surface water bodies (million cubic meters)	133,674	130,387	98%	-3,287.00	Positive
CO2 equivalent GHG emissions (million metric tons)	80.9	72.7	90%	-8.20	Positive
Green investments (RUB million)	44,343.4	54,735.3	123%	10,391.90	Positive

(*Source*: Rosneft, 2022; author's research)

For Rosneft, Total environmental protection expenditures decreased by 1% in 2021 compared to 2020, meaning 251 RUB million. The waste generation had in 2021 a huge positive impact on the environment compared to 2020, being with 62% lesser, more precisely with 9,348,000 tons less than in 2020. Pollutant emissions were less by 12% in 2021 compared to 2020. Water discharge into surface water bodies decreased by 2% compared to 2021, more precisely this was lower with 3287 million cubic meters. The Company has constantly carried out a number of organizational, technical, and investment initiatives to upgrade treatment facilities at Group Subsidiaries in an effort to minimize this possible impact (Rosneft, 2022). CO_2 equivalent GHG emissions indicator was better in 2021 compared to 2020, because it decreased by 10%. Green investments had a positive impact on the environment being higher by 23% than in 2020, meaning 10,391.90 RUB million.

5.3. Lukoil

The word "LUKOIL" is a combination of the first initials of the names of the cities of Langepas, Urai, and Kogalym, which are the locations of the company's principal oil-producing subsidiaries. One of the biggest oil and gas vertically integrated businesses in the world, Lukoil is responsible for over 2% of global crude production and roughly 1% of the world's proven hydrocarbon reserves. For almost 30 years, LUKOIL has been one of the world's top producers of crude oil and gas, as well as refiners of petroleum products and petrochemicals. Each day, billions of people around the world purchase their products and utilize them to improve the quality of their lives.
(Lukoil, 2023)

For Lukoil, Total environmental protection expenditures decreased with 5% in 2021 compared to 2020, meaning 1056 RUB million. Waste generation had a positive impact on the environment in 2021 compared to 2020, being with 5% lesser, more precisely with 113,000 tons less than in 2020. Pollutant emissions had a negative impact on the environment with an increase of 8% compared to 2020. Water discharge into surface water bodies had a huge negative impact with an increase of 30%, and we found that those numbers are without the sea. CO_2 equivalent GHG emissions indicator was better in 2021 compared to 2020, because it decreased with 5%. Green investments represent the best indicator in 2021, with an increase of 79%, meaning 15 RUB million.

Table 3. **Lukoil sustainability indicators**

LUKOIL sustainability indicators	2020	2021	%	2021-2020	Impact
Total environmental protection expenditures (RUB million)	22,440	21,384	95%	-1,056.00	Negative
Waste generation (tons)	2,178,000	2,065,000	95%	-113,000	Positive
Pollutant emissions (tons)	395,000	425,000	108%	30,000	Negative
Water discharge into surface water bodies (excluding the sea) (million cubic meters)	162	210	130%	48	Negative
CO_2 equivalent GHG emissions (million metric tons)	43.7	41.5	95%	-2.16	Positive
Green investments (RUB million)	19.0	34.0	179%	15.00	Positive

(*Source*: Lukoil , 2022; author's research)

5.4. The sustainability indicators of Gazprom, Lukoil and Rosneft 2020 and 2021

In 2021, the firms assessed have favorable overall sustainability metrics. Waste generation dropped and green investments grew for each organization. The total amount spent on environmental protection grew by 1%, or 555.59 RUB million. The impact on waste generation was higher on the positive side, falling by 47% in 2021, or 9,644,240 tons less than in 2020. Pollutant emissions dropped by 2%, or by 89,350 tons, from 2020 to 2021. Water discharge into surface water bodies dropped also by 2%, or by 2,624.34 million cubic meters. The indication that had a negative effect was the increase in CO_2 equivalent GHG emissions in 2021 over 2020 of 7%.

Table 4. **Sustainability Indicators of Gazprom, Lukoil and Rosneft**

Indicators	2020	2021	%	2021-2020	Mean	Impact
Total environmental protection expenditures (RUB million)	88,308.66	88,864.25	101	555.59	88,586.46	Positive
Waste generation (tons)	20,604,830	10,960,590	53	-9,644,240	15,782,710	Positive
Pollutant emissions (tons)	4,361,660	4,272,310	98	-89,350	4,316,985	Positive
Water discharge into surface water bodies (million cubic meter)	136,446.78	133,822.44	98	-2,624.34	135,134.61	Positive
CO_2 equivalent GHG emissions (million metric tons)	334.87	357.47	107	22.60	346.17	Negative
Green investments (RUB million)	58,349.55	115,298.87	198%	56,949.32	86,824.21	Positive

(*Source*: Author's research)

6. Conclusions

Our investigation focuses on a few important Russian energy corporations. The companies analyzed in this paper, Gazprom, Rosneft, and Lukoil, are included in the top 15 biggest oil and gas companies worldwide based on net income as of 2022 (Statista, 2023), more precisely Gazprom is in first place worldwide with 35.93 billion U.S. dollars, Rosneft on seventh place with 15.84 billion U.S. dollars, and Lukoil on the ninth place with 13.87 billion U.S. dollars.

For each company, Waste generation decreased and Green investments increased. Overall, the sustainability indicators of the enterprises analyzed are positive in 2021, meaning that the negative impact on the environment was lower than it was in 2020. The indicator with a negative impact was CO_2 equivalent GHG emissions that increased in 2021 by 7% compared with 2020. Total environmental protection expenditures increased by 1%, more precisely with 555.59 RUB million. The waste generation had the higher positive impact, meaning that it decreased by 47%, more precisely in 2021 it was lower with 9,644,240 tons than in 2020. Pollutant emissions decreased by 2%, meaning that were lower with 2,624.34 million cubic meters in 2021 than in 2020.

This research contributes to the literature on the subject of sustainability indicators in Russian energy companies and for positive results on the environment, it could be a marker for energy companies to follow the same actions taken by those companies. The findings are expected to be valuable to academics and practitioners interested in corporate sustainability reporting and sustainability indicators This study offers deep evaluations of the indicators used in sustainability reporting by energy firms.

The limitation of this research is the small number of entities analyzed and we could not exclude the human mistakes that could have occurred due to manual work and due to the complexity of the sustainability reports analyzed. Although the "two-wave longitudinal study" can provide some insights into modifications over time, it might not offer as much depth or nuance as an investigation with more periods. We couldn't rule out the possibility of human error as a result of manual work.

Further research could extend period on time and could analyze the influence of the war on sustainable indicators of Russian energy companies, but also on financial indicators.

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References

Artene, A., Bunget, O.C., Dumitrescu, A.C., Domil, A.E., & Bogdan, O. (2020) Non-Financial Information Disclosures and Environmental Protection - Evidence from Romania and Greece, *Forests,* vol. 11, no. 8: 814, https://doi.org/10.3390/f11080814

Bartoszewicz, A., & Szczepankiewicz, E. (2022) Evolution of Energy Companies' Non-Financial Disclosures: A Model of Non-Financial Reports in the Energy Sector. *Energies*, vol. 15, no. 20: 7667, https://doi.org/10.3390/en15207667

Belyakov, N. (2019) *Sustainable Power Generation : Current Status, Future Challenges, and Perspectives* (2019 ed.). (A. Press, Ed.) London, United Kingdom: Elsevier Inc. https://doi.org/10.1016/B978-0-12-817012-0.00032-3

BP. (2022) *BP Statistical Review of World Energy 2022, 71st edition*, available on-line at: https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf

Buallay, A., & AlDhaen, E. (2018) *The Relationship Between Audit Committee Characteristics and the Level of Sustainability Report Disclosure*, in: Al-Sharhan, S. *et al.* Challenges and Opportunities in the Digital Era. I3E 2018. Lecture Notes in Computer Science, vol, 11195: 492–503, https://doi.org/10.1007/978-3-030-02131-3_44

Bychkova, S., Karelskaia, S., Abdalova, E., & Zhidkova, E. (2022) Social responsibility as the dominant driver of the evolution of reporting from financial to non-financial: theory and methodology, *Foods and Raw Materials*, vol. 9, no. 1: 135-145, https://doi.org/10.21603/2308-4057-2021-1-135-145

Calu, D., & Nichita, M. (2020) Non-Financial Reporting and Reporting for Management in the Circumstances of the Coronavirus Crisis, *CECCAR Business Review,* no. 6: 13-20, doi:10.37945/cbr.2020.06.02

Chauhan, Y., & Kumar, S. (2018) Do investors value the nonfinancial disclosure in emerging markets, *Emerging Markets Review,* vol. 37: 32-46, https://doi.org/10.1016/j.ememar.2018.05.001

Chauhan, Y., & Kumar, S. (2019) The value relevance of nonfinancial disclosure: Evidence from foreign equity investment, *Journal of Multinational Financial Management,* vol. 52–53: 100595, https://doi.org/10.1016/j.mulfin.2019.100595

Council of the European Union (2022) *Council agrees on emergency measures to reduce energy prices,* available on-line at: https://www.consilium.europa.eu/en/press/press-releases/2022/09/30/council-agrees-on-emergency-measures-to-reduce-energy-prices/

Council of the European Union. (2022) *European Council - Infographic - Energy crisis: Three EU-coordinated measures to cut down bills,* available on-line at https://www.consilium.europa.eu/en/infographics/eu-measures-to-cut-down-energy-bills/

Dragu, I.-M., & Tiron-Tudor, A. (2013) The Integrated Reporting Initiative from an Institutional Perspective: Emergent Factors, *Procedia - Social and Behavioral Sciences,* vol. 92: 275-279, https://doi.org/10.1016/j.sbspro.2013.08.672

Dumitru, M., & Guşe, R.-G. (2016) Assurance of integrated reports: the state of the art, *Audit financiar,* vol. XIV, no. 2(134): 227-234, DOI: 10.13140/RG.2.1.4994.7923

Dumitru, M., Dyduch, J., Gușe, R.G., & Krasodomska, J. (2017). Corporate Reporting Practices in Poland and Romania – An Ex-ante Study to the New Non-financial Reporting European Directive, *Accounting in Europe*, vol. 14, no. 3: 279-304, https://doi.org/10.1080/17449480.2017.1378427

Dynera, I., & Larsen, E. (2001) From planning to strategy in the electricity industry, *Energy Policy,* vol. 29, no.13: 1145-1154, https://doi.org/10.1016/S0301-4215(01)00040-4

Eberhard, J. *et al.* (2000) Energy End-Use Efficiency, in *World Energy Assessment: Energy and the Challenge of Sustainability:* 172-218, *available on-line at: http://large.stanford.edu/courses/2017/ph240/huang2/docs/undp-2000.pdf#page=228*

Environmental Protection Agency (EPA) (2023) *Overview of Greenhouse Gases*, available on-line at https://www.epa.gov/ghgemissions/overview-greenhouse-gases

Eugénio, T., Gomes, S., Branco, M., & Morais, A. (2022) Non-Financial Reporting and Assurance: A New Opportunity for Auditors? Evidence from Portugal, *Sustainability*, vol. 14, no. 20: 13469, https://doi.org/10.3390/su142013469

European Environment Agency (EEA). (2018) *Greenhouse gas emissions by country and sector (infographic),* available on-line at https://www.europarl.europa.eu/news/en/headlines/society/20180301STO98928/greenhouse-gas-emissions-by-country-and-sector-infographic

Filyppova, S., Selivanov, N., & Fraiman, A. (2021) Theoretical and Methodogical Basis for Non-Financial Reporting Preparation Regarding Socially Responsible Activities of an Enterprise During the COVID-19 Pandemic, *Economics*, vol. 55, no. 3: 5-15, DOI: 10.15276/ETR.03.2021.1

Gates, B. (2021) *How to Avoid a Climate Disaster. The Solutions We Have and the Breakthroughs We Need,* Knopf Doubleday Publishing Group.

Gazprom. (2022) *Sustainability report 2021*. Gazprom, Available on-line at https://sustainability.gazpromreport.ru/fileadmin/f/2021/sustainability-report-en-2021.pdf

Gazprom. (2023) *About us*, available on-line at https://www.gazprom-international.com/about/

Gleick, P. (1994) Water and Energy, *Annual Review of Energy and the Environment*, vol. 19: 267-299, available on-line at https://www.annualreviews.org/doi/pdf/10.1146/annurev.eg.19.110194.001411

Grueso Gala, M., & Camisón Zornoza, C. (2022) A bibliometric analysis of the literature on non-financial information reporting: Review of the research and network visualization, *Management Letters*, vol. 22, no.1 175-192: DOI: 10.5295/cdg.211545mg

Gușe, G., Almășan, A., Circa, C., & Dumitru, M. (2016). The role of the stakeholders in the institutionalization of the CSR reporting in Romania, *Accounting and Management Information System,* vol. 15, no. 2: 304-340.

IEA – International Energy Agency. (2022) *Global Energy Crisis. How the energy crisis started, how global energy markets are impacting our daily life, and what governments are doing about it*, available on-line at https://www.iea.org/topics/global-energy-crisis.

Kateifides, A. (2022) *CSRD: EU ESG disclosure rule is approved*, available on-line at https://www.onetrust.com/blog/eu-csrd-corporate-sustainability-reporting-directive/

Kim, Y., & Ozdemir, S. (2014) Structuring Corporate Boards for Wealth Protection and/or Wealth Creation: The Effects of National Institutional Characteristics, *Corporate Governance: An International Review,* vol. 22, no. 3: 266-292. doi:http://dx.doi.org/10.1111/corg.12062

La Torre, M., Sabelfeld, S., Blomkvis, M., & Dumay, J. (2020) Rebuilding trust: sustainability and non-financial reporting and the Filyppova Union regulation, *Meditari Accountancy Research,* vol. 28, no. 5: 701-725. doi:https://doi.org/10.1108/MEDAR-06-2020-0914

Lukoil. (2022) *Sustainability Report 2021,* available on-line at https://www.lukoil.com/FileSystem/9/592422.pdf

Lukoil. (2023) *History*, available on-line at https://www.lukoil.com/Company/history

Lungu, C., Caraiani, C., Dascălu, C., Turcu, D., & Turturea, M. (2016) Archival analysis of Corporate Social Responsibility research: the Romanian perspective, *Accounting and Management Information Systems,* vol. 15, no. 2*:* 341-371

Manes-Rossi, F., Tiron-Tudor, A., Nicolò, G., & Zanellato, G. (2018) Ensuring More Sustainable Reporting in Europe Using Non-Financial Disclosure - De Facto and De Jure Evidence, *Sustainability*, vol. 10, no. 4: 1162, https://doi.org/10.3390/su10041162

Milu, N.D., & Hațegan, C. (2021) The Stage of Non-financial Reporting in Romania, *Contemporary Studies in Economic and Financial Analysis, in: Contemporary Issues in Social Science*, vol. 106: 327-340, doi:10.1108/S1569-375920210000106020

Nichita, M., Nechita, E., Manea, C.L., Manea, D., & Irimescu, A.M. (2020) Reporting on Sustainable Development Goals. A score-based approach with company-level evidence from Central-Eastern Europe economies, *Accounting and Management Information Systems,* vol. 19, no. 3: 501-541, http://dx.doi.org/10.24818/jamis.2020.03004

Pablo-Romero, M., Sánchez-Braza, A., & González-Jara, D. (2022) Economic growth and global warming effects on electricity consumption in Spain: A sectoral study, *Environmental Science and Pollution Research*, vol. 30: 43096-43112, https://doi.org/10.1007/s11356-022-22312-5

PwC. (2022) *PwC Asset and wealth management revolution 2022: Exponential expectations for ESG,* svailable on-line at https://www.pwc.com/gx/en/financial-services/assets/pdf/pwc-awm-revolution-2022.pdf

Refait-Alexandre, C., Farvaque, E., Gainet, C., & Saidane, D. (2009) Is Corporate Disclosure Necessarily Desirable? A Survey, http://dx.doi.org/10.2139/ssrn.1494238, available on-line at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1494238

Robins, F. (2006) The Challenge of TBL: A Responsibility to Whom? *Business and Society Review,* vol. 111, no. 1: 1-14, https://doi.org/10.1111/j.1467-8594.2006.00258.x

Rosneft. (2022) *Sustainability report 2021,* available on-line at https://www.rosneft.com/upload/site2/document_file/Rosneft_CSR2021_ENG.pdf

Rosneft. (2023) *Rosneft at a glance*, available on-line at https://www.rosneft.com/: https://www.rosneft.com/about/Rosneft_today/

Shove, E., & Gordon, W. (2014) What Is Energy For? Social Practice and Energy Demand, *Sage Journals,* vol. 31, no. 5: 41-58, https://doi.org/10.1177/0263276414536746

Simionescu, L., & Dumitrescu, D. (2018) Empirical Study towards Corporate Social Responsibility Practices and Company Financial Performance. Evidence for Companies Listed on the Bucharest Stock Exchange, *Sustainability*, vol.10, no. 9: 3141, doi:10.3390/su10093141

Sridhar, K. (2012) Is the Triple Bottom Line a restrictive framework for non-financial reporting? *Asian Journal of Business Ethics*, no. 1: 89-121 (2012), https://doi.org/10.1007/s13520-011-0010-4

Statista. (2023) *Electricity and heat energy revenue of Gazprom worldwide from 2016 to 2021(in billion Russian rubles)*, available on-line at https://041162gqw-y-https-www-statista-com.z.e-nformation.ro/statistics/350701/electricity-and-heat-energy-revenues-of-gazprom-globally/?locale=en

Statista. (2023) *Leading oil and gas companies worldwide based on net income as of 2022*, available on-line at https://041162gty-y-https-www-statista-com.z.e-nformation.ro/statistics/272711/top-global-oil-and-gas-companies-based-on-net-income/

Stolowy, H., & Paugam, L. (2018) The expansion of non-financial reporting: an exploratory study, *Accounting and Business Research*, vol. 48, no. 5: 525-548, https://doi.org/10.1080/00014788.2018.1470141

Turzo, T., Marzi, G., Favino, C., & Terzani, S. (2022) Non-financial reporting research and practice: Lessons from the last decade, *Journal of Cleaner Production, vol.* 345, no. 1: 131154, https://doi.org/10.1016/j.jclepro.2022.131154

Wilkinson, P., & Markandya, A. (2007). Electricity generation and health, *The Lancet*, vol. 370, no. 959: 979-990, https://doi.org/10.1016/S0140-6736(07)61253-7

SECTION 2 Workshop Accounting in Europe

Follow Your Values – Accounting and Communication of a Female CEO in the Oil & Gas Industry

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Follow Your Values – Accounting and Communication of a Female CEO in the Oil & Gas Industry

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Abstract: *The purpose of this study is to analyze the relationship between values and leadership as reflected in the accounting narratives. The paper draws on the case of a female CEO in the oil and gas industry that was involved in the transformation of a privatized company, OMV Petrom. During her tenure the company became the largest oil and gas producer in South-East Europe. However, her reign was not free of challenges. Following a contested change in ownership that lacked transparency, the company underwent a restructuring process that involved major layoffs. In addition, the 2008 economic crisis and the 2014 oil price crisis negatively impacted corporate performance. As such, we analyzed the transposition of personal values in accounting narratives using a narrative rationality lens. The managerial discourses published between 2006 and 2017 were assessed in order to analyze thevalues in-use. The results suggest that the personal values of the CEO are further transposed incorporate actions, although being in a limited format. The longitudinal analysis revealed a lack of coherence between stories, influenced by contextual factors.*

Keywords: *Narrative paradigm, leadership, values, discourse.*

1. Introduction

The purpose of this study is to analyze the relationship between a CEO’s personal values and their leadership as reflected in corporate accounting narratives. Previous research documents the major influence that values have on the beliefs and behavior of individuals (Gordon, 1996 cited by Hood, 2003). In a corporate context, CEOs tend to imprint their personal value system onto their organization (Enz, 1988). As a CEO’s value system can trigger specific behaviors in their employees (Carpenter *et al.*, 2004) and even become inspirational within their organization (Hood, 2003), the personal values of a CEO play an important role in the processes and outcomes of the organization they lead (Hambrick and Mason, 1984).

The paper draws on the case of Mariana Gheorghe (MG), a female CEO in a traditionally male dominated industry, oil and gas. Between 2006 and 2018, MG led the transformation of the largest oil and gas producer in South-East Europe, OMV Petrom, from being a socialist state company into a private firm with a listing at the London Stock Exchange. Constantly emphasizing the value of business ethics, she implemented state-of-the-art business practices, European regulations and standards, as well as principles of corporate governance and social responsibility, while having had to navigate OMV Petrom through a major restructuring process and a number of severe

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crises (Agiu, 2022; Lupu and Sandu, 2017). The manifold challenges and turbulences of MG's twelve-year reign, and her commitment to value-based leadership qualify this case to study how a CEO's personal values feature in corporate accounting narratives.

In turn, this study adopts a narrative perspective as its analytical lens (Fisher, 1984), and identifies MG's personal values from a wide range of publicly available interviews with her. Analyzing how these values are expressed in her letters to shareholders as featured in OMV Petrom's annual and sustainability reports, we assess the coherence of her storytelling as CEO. We find that her personal values feature prominently in her organization's corporate narratives. However, we observe a lack of narrative coherence especially during organization's phases of crisis. We therefore conclude external factors, which are no under control of the CEO, may be a driver for narrative inconsistencies.

This paper contributes to our understanding of how a CEO integrates her values in the company's corporate narratives by demonstrating that values shape the managerial actions. Moreover, our research also speaks to Upper Echelon research. While this research often uses proxies, to identify and analyze top management values (Boal and Hooijberg, 2000), our study demonstrates how leadership values and their effect on the organization can be studied more directly. In addition, by analyzing the personal values, as proclaimed by the storyteller, we contribute to previous research on narrative rationality by analyzing the coherence with the self.

The next section introduces our research framework and design. Section 3 then introduces the focal CEO of the study and contains the analysis of her personal values. Section 4 discusses how these values are reflected in the organization's annual reports. The final section concludes the paper.

2. Research framework and design

According to Fisher (1984) humans are storytellers. Their discourses can be regarded as "stories competing with other stories constituted by good reasons" (Fisher, 1984, p. 2). As humans are "valuing, reasoning beings" (Fisher, 1994, p. 23), the meaning, validity and truth of "good reasons" can be assessed in any narrative context that features historical, cultural, biographical and characterological dimensions, such as interviews, letters, or other private andpublic documents (Fisher, 1984, 1994).

Narrative rationality describes the process used to assess an individual's values and their reasoning, by drawing on the concepts of fidelity and coherence (Fisher, 1994). In this context,fidelity refers to the identification of an individual's values as explicitly or implicitly conveyedby a story of theirs, including its context and related reasoning. Coherence asks if an individual's value expressions are consistent, by comparing and contrasting value expressionsacross different stories they tell.

Our narrative rationality analysis proceeded as follows. First, we collected and analyzed 13 interviews with the focal CEO that were available online, in a video or text format. These materials were studied with regard to fidelity, in order to identify the CEO's espoused values.Initially, both authors analyzed the interviews for the expression of values and agreed that family stood out most prominently across all interviews. Hence, these values constituted the fidelity of the focal CEO, which is discussed in the following section 3. Second, we collected all of the CEO's letters published in 12 annual and 4 sustainability reports of OMV Petrom assigned by the CEO between 2006 and 2017. Conceptualizing these elements of the corporate narrative as the CEO's stories, they were analyzed to identify the CEO's 'values in-use' (Meglino and Ravlin, 1998). By juxtaposing the espoused values with the values in-use, both over time and across topics, we assessed the coherence of the focal CEO's narratives. The corresponding results feature in section 4.

3. Portray of a female CEO: Mariana Gheorghe

Family is the most important value for Mariana Gheorghe, as she attributes her professional successes mostly to the continuous support provided by her loved ones.

> *Family is the most important value for me. Without my family I could not have done everything I have done. Without the understanding, love, and support of my husband, especially* (Nicolae, 2007).

During her time with the European Bank for Reconstruction and Development she lived in London, with her son and husband, and found the support provided by the wider family invaluable.

> *My father-in-law and my parents stayed with us for six months to help us. Everyone was with us so that we could face the "London" adventure. (...) They all helped me a lot. Without them, I wouldn't have succeeded* (Nicolae, 2007).

This indicates that MG perceives her personal and professional life as deeply interwoven and may also explain why she projects her personal values on her professional environment, making Petrom 'this project of mine' (Nicolae, 2007).

As a mother, MG knew about the importance of being a role model for your own child, and sheadopted that mindset to Petrom, her "second child" (Eugenia Vodă, 2014), as the following quotes suggest:

> *We all need a society, a framework in which to live and work, and this society must inspire us and give us the power to live and work as well as possible, with as much satisfaction as possible. (...) And I think that I work for a company that can be a model for the younger generation, precisely because of some of the features that fit the qualities of a model company* (Junior Achievement Romania, 2010).

Based on this understanding of leadership, MG nurtured a strong sense of mentorship and people development, which she promoted as 'professional excellence' in Petrom's code of conduct:

> *Professional excellence ensures lasting success. We learn, we perform, we succeed. Continuous learning, high performance and personal commitment are the sources for our professional excellence. We strive to achieve excellence in expertise, processes and leadership. We concentrate on our goals and find synergies to ensure we are amongst the frontrunners in the*

market. Our aim is to foster professional development to generate long-term profitability (Petrom, 2008).

MG frequently emphasized the significance of her employees to remind the public that they are the center of corporate management at Petrom:

The role of a manager, or perhaps even more, of a leader, is to identify the potential of each team member, so that they can contribute every day, using their capabilities and skills to the development of the business and to increase its performance (Capital, 2015).

Consequently, MG consistently attributed the positive corporate results to the collective contribution of the Petrom 'family'.

We all know that success in a business, and especially a business as big as OMV Petrom, does not depend on one person. It is the result of the performance of the entire team, making great and continuous efforts to achieve a level of performance (Capital, 2015).

As a result, when analyzing on the sources of corporate success, for MG people come first, before financial and material resources:

Here we are today, in 2015, having a company with a solid business, but also the perspective of a [bright] future, the result of great efforts, both human, managerial, and investment. We have spent more than 11 billion over the past 10 years to bring the company and its prospects to where we are today.

4. Mariana Gheorghe's value-based narratives in Petrom's annual reports

2006-2009

Following privatization, Petrom entered a restructuring and modernization program, supported by major investments of RON 17,306 mn between 2006 and 2009 while the financial performance started to improve. From a loss of RON 974 mn in 2004, the company reached RON 2.285 mn in 2006. Within Petrom's corporate narratives, MG echoed her ideas and vision of family. She attributed the positive financial performance outcomes to internal factors (Aerts and Tarca, 2010). Particularly, the success of the company was attributed to factors such as the 'responsible approach', 'consistency of our strategy' and 'determination to reach our objectives'. This further reflects her strong belief that hard work and passion lead to success (e.g., Nicolae, 2007; Junior Achievement Romania, 2010; Capital, 2015).

2006 is the second year in a row in which the company shows a strong performance. This proves our responsible approach, the consistency of our strategy and our determination to reach our objectives (Petrom, 2006).

One of the steps towards the company's sustainable success entailed investments in employees' professional development. By rolling out programs for their skills improvement the company sought to increase its own efficiency (Capital, 2015). In turn, corporate success may enhance the employees' motivation 'to continue, to make efforts, to do more and better, to be successful (Junior Achievement Romania, 2010).

> *None of these objectives can be achieved without the essential contribution of the most important resource, the people. We invested in our employees' development and we will continue to constantly roll out such programs* (Petrom, 2006).

The 2008 economic crisis generated a steep decrease in the oil price which was reflected in a subsequent decrease of 43% in the net profit. However, in her letter, MG highlighted the benefits of the restructuring and modernization programs and attributed the operational achievements to internal factors. The use of the words 'more importantly' further supports theidea that for MG people come first before the influence of other internal causes.

> *These results were possible due to a considerable investment effort, which rose to reach record levels of over RON 6 bn in 2008, 68% higher than the previous year, exceeding all our investment obligations stemming from the privatization contract. More importantly, these achievements were the result of the high level of commitment of our employees, supported by the continuous transfer of know-how from OMV Group* (Petrom, 2008).

However, in 2008 the side effects of the restructuring process and its layoffs, started to materialize. As such, several litigations were initiated by former and current employees that negatively influenced the financial results of the company.

> *Still, the past year was a year of mixed results as achievements recorded in 2008 were overshadowed by the high level of one-off items booked throughout the year: provisions for litigations and restructuring (...) Among the above-mentioned one-off items, the provision Petrom had to book for litigations initiated by former and current employees, conspicuous by its considerable size – RON 1.3 bn - had the largest negative impact on the Company's results. The litigations are based on differing interpretations of several clauses included in Petrom's Collective Bargaining Agreement regarding the granting of some bonuses previously included in the base salary (since 2003). Thus far, Petrom has taken all possible actions and committed all necessary resources to defend against the lawsuits and also to prevent a further increase in litigation* (Petrom, 2008).

In order to 'prevent a further increase in litigation', the company sent a letter to its employees. Particularly, for those who won certain amounts of money in court, they recommended to reimburse the money to Petrom, and to those who have lawsuits pending, to give up legal action (Mediafax, 2009).

According to a press release made in 2009 by Petrom, the final number of the employees should reflect the needs and development of the company (PRO TV, 2009). The selection process of the family members entailed major layoffs, but it was followed by a change in organizational culture and professional development. The next quote from an interview highlights MG's vision related to the impact of the restructuring process.

> *We will continue the reorganization even further to reach the desired level of productivity. Petrom has a plan to increase the company's competitiveness gradually and this inevitably leads to layoffs. For all cases compensatory payments are given and employees are helped to find new jobs* (Ziarul Financiar, 2009).

The benefits of the restructuring process are also related to 'the quality of people' (Junior Achievement Romania, 2010), a characteristic that is highly appreciated by MG.

> *The restructuring and reorganizations that we are pursuing will deliver increased effectiveness and efficiencies in the years to come. We have committed to the introduction of a management culture based on performance, which will further improve our management capability to deal with the increasingly complex and demanding marketplace of the future* (Petrom, 2009).

In spite of the restructuring dispute, the letters to shareholders published in 2008 and 2009 emphasize the respectful attitude towards all employees and the acknowledgement of their efforts.

> *We are committed to treating every employee with respect, providing a safe and quality working environment, and offering the means for continuous professional and personal development* (Petrom, 2008).

2010-2013

The last quarter of 2010 marked the stabilization of the Romanian economy following the negative impact of the financial crisis in 2008. Moreover, the oil price increased by 28% compared to the levels recorded in 2009 and favorably influenced the performance of the company as profit increased by 156%. The results were further allocated to the contribution of the management team and of the employees. Through the use of enhancements (Aerts and Tarca, 2010), MG creates a contrast between the 'weak economic environment' and family's contribution to success.

> *First and foremost, 2010 was an important milestone in Petrom's strategic path towards becoming a leading integrated energy player in Southeastern Europe. It was also a proof of management's ability to adapt and successfully steer the company through challenging market conditions (...) Moreover, our focus on streamlining operations and strict cost management enabled us to deliver a strong set of results, in spite of a weak economic environment* (OMV Petrom, 2010).

In 2011 the oil price increased by 40% and remained favorable until 2013. Although the oil price has a major influence for Petrom, as its most important business segment is exploration and production, MG highlights the family's input. The same tendency was documented in otherreports as well. Although this may be considered as biased (Aerts and Tarca, 2010), it can be justified by her strongbelief in the power of the family.

> *We look back at 2011 as a year of outstanding operational performance and strong financial results for Petrom, albeit with some external challenges. This was a result of high investment efforts, effective cost and operational management but also supportive crude prices. With the great commitment of our employees, we continued to deliver on our strategic direction of leveraging Petrom's integrated business model as a key element to value creation. To this end, we successfully pursued our efficiency enhancement programs and continued to streamline our operations* (OMV Petrom, 2011).

During this period, MG reiterated the company's commitment towards continuous investments in employees' professional development as this approach can further ensure the sustainable growth of the company.

> *In doing so, we will focus on maximizing the performance potential of our people, and to strengthen the organization and its management* (OMV Petrom, 2010).

2014-2017

The year 2014 witnessed the rapid decline in the oil price, which halved in the last semester. The same pattern was followed by the profit, which decreased by 56% as compared to the peakrecorded in 2013. However, the same year marked the celebration of 10 years since OMV Petrom's privatization. In her letter, MG mainly focused on the achievements recorded during this period as a result of the restructuring and modernization programs implemented by the company.

> *In 2014, we celebrated 10 years since OMV Petrom's privatization, one of the largest privatization deals in Romania. The journey has been challenging, but we have achieved the complex and successful transformation of a state-owned company, in what is a strategic sector for Romania's economic growth. OMV Petrom is now a modern, competitive and successful European player and a stable pillar of the Romanian economy. Today, we cover around 40% of Romania's oil, gas and fuel supply and we continue to explore for onshore and offshore resources, in order to ensure our necessary energy needs are met in the future. Since privatization, the organization has undergone a significant restructuring and modernization program adjusting to changing business needs, strengthening the management and its people. From a traditional state-owned company, facing challenges such as underinvestment, obsolete assets, inefficiency, bureaucracy and debts, we have transformed to become a sustainable and high-performance company, relevant for Romania and the region* (OMV Petrom, 2014).

In her view, the changes initiated by the management in the past ensured the transformation of OMV Petrom into a leader of the industry. Drawing on past achievements, MG provides assurance that the 'decisive actions' of the management team will help the company to further address the challenges of the market.

> *After ten years of profound transformation and a good track record in achieving our strategic goals, I believe OMV Petrom has a strong foundation to cope with the current market downturn. The turbulent market conditions*

> *experienced since mid-2014 have continued in early 2015, and we have taken decisive actions to better control our investments and costs. These measures are expected to support our efforts to maximize the integrated value of our company, to continue business optimization and allow us to position ourselves for future growth* (OMV Petrom, 2014).

The year 2015 witnessed another drop in the oil price. Although it used hedging instruments, the company recorded its first loss following privatization. However, MG tried to emphasize the family's efforts to counteract the negative influence of the external factors.

> *2015 was a challenging year for the global oil and gas industry, with oil prices continuing to drop significantly. Our organization has responded swiftly to the weak market fundamentals through intensified cost optimization programs and scaled back investments, which allowed us to maintain a strong balance sheet and protect our cash flow position* (OMV Petrom, 2015).

Although the financial performance was negatively affected by the economic downturn, MG devoted a close attention to ensuring a safe working environment for her family members.

> *Firstly and most importantly, safety across all our operations improved further, evidencing our commitment to apply high standards of health and safety for our own employees as well as contractors'. Combined LTIR employees and contractors decreased to 0.30 from 0.33 in 2013* (OMV Petrom, 2014).

In 2016 the oil price recorded the lowest level in the entire period of analysis. The financial performance of the company improved, and this was further allocated to the family's quick adaptation to challenging conditions.

> *In this context, we achieved several strategic milestones, while on the operational side, we delivered on important objectives. We further capitalized on our integrated business model, showing resilience in our results. Our swift reactions to challenging market fundamentals continued. As the CEO I am proud of the successful implementation of cost optimization programs that have led to a reduction of approx. RON 500 mn in operational costs in 2016 versus 2015, on top of a similar amount saved in 2015 versus 2014* (OMV Petrom, 2016).

Moreover, in October the company was listed at the London Stock Exchange. Unlike the previous years when MG constantly mentioned the contribution of employees to corporate success, the company's commitment to invest in their professional development and apply highstandards of health and safety, the focus switched to the needs of the current and potential investors. Particularly, MG's discourse emphasized the future perspectives of the company. Inaddition, the company's objective 'to offering an attractive dividend to our shareholders' was mentioned twice in the same letter (OMV Petrom, 2016).

> *We will enhance our efficiency and integration, maximize our Upstream portfolio's potential, pursue growth opportunities that Romania still offers and expand our regional footprint. We shall do so by leveraging the power of our people and assets, with sustainability at the core of our business and embedding technology and innovation in our daily operations (...). For our shareholders we are committed to deliver an attractive dividend, while maintaining a strong balance sheet* (OMV Petrom, 2016).

The segregation of the family and the transition to a business language was more prominent in the last letter signed by MG in 2017. The farewell included no explicit reference to the employees and their support across time. The same observation was documented in the letter included in the sustainability report issued in 2017.

> *Finally, since this is my last letter to you in my capacity as CEO of OMV Petrom, I have a few farewell comments. Over my twelve years at the helm of the company, I am proud and honored to have played a part in transforming OMV Petrom into a robust, dynamic, internationally competitive and highly profitable company and in defining its current 2021+ strategic directions. During this period, the company went through two major industry downturns and one financial crisis. I truly believe the organization has become much more mature and can now benefit from a new generation of leadership. In this context, let me welcome Christina Verchere, an exceptional professional who is joining OMV Petrom after having spent over 20 years in the industry, including in leadership positions at BP in the UK, the USA, Canada, and the Asia-Pacific region. I wish her and the Executive Board team all the best in successfully steering this great company into the future* (OMV Petrom, 2017).

5. Concluding discussion

The results suggests that the personal values of the CEO are further transposed in corporate actions, although being in a limited format. As such, the longitudinal analysis revealed a lack of coherence between stories, as a result of contextual factors.

This paper contributes to previous literature by demonstrating how a female CEO integrates her values in the company's corporate narratives. While Upper Echelon research used mainly proxies for values (Boal and Hooijberg, 2000) we seek to contribute to this stream of literature by analyzing the espoused values of a CEO. In addition, by analyzing the personal values, as proclaimed by the storyteller, we contribute to previous research on narrative rationality by analyzing the coherence with the self.

References

Aerts, W. & Tarca, A. (2010) „Financial performance explanations and institutional setting", *Accounting and Business Research*, vol. 40, no. 5: 421-450

Agiu, M. (2022, December 14) „Privatizarea Petrom: cum a ajuns în mâinile austriecilor de la OMV", *Adevărul*, available on-line at https://adevarul.ro/economie/privatizarea-petrom-cum-a-ajuns-in- mainile-2227737.html

Boal, K.B. & Hooijberg, R. (2000) "Strategic leadership research: Moving on", *Leadership Quarterly*, vol. 11: 515-549

Capital (2015) „Mesaj Mariana Gheorghe” [Video], *YouTube*, available on-line at https://www.youtube.com/watch?v=eQlQI5FSKB8&list=LL

Carpenter, M.A., Geletkanycz, M.A., & Sanders, W.G. (2004) “Upper echelons research revisited: Antecedents, elements, and consequences of top management team composition”, *Journal of Management*, vol.30: 749-778

Enz, C.A. (1988) “The role of value congruity in intraorganizational power”, *Administrative science quarterly*, vol. 33: 284-304

Vodă, E. (2014, March 8) „Profesioniștii – Mariana Gheorghe” [Video], available on-line at http://www.eugeniavoda.ro/ro/emisiuni/diverse/mariana-gheorghe

Fisher, W.R. (1984) “Narration as a human communication paradigm: The case of public moral argument”, *Communications Monographs*, vol. 51, no. 1: 1-22

Fisher, W.R. (1994) “Narrative rationality and the logic of scientific discourse”. *Argumentation*, vol. 8: 21-32

Hambrick, D.C. & Mason, P.A. (1984) “Upper echelons: The organization as a reflection of its top managers”, *Academy of Management Review*, vol. 9: 193-206

Hood, J.N. (2003) “The relationship of leadership style and CEO values to ethical practices in organizations”, *Journal of Business Ethics*, vol. 43: 263-273

Junior Achievement Romania (2010, June 30) „Mariana Gheorghe - Promoția 2010 Romanian Business Hall of Fame” [Video], *YouTube*, available on-line at https://www.youtube.com/watch?v=fhh8i6n_z1o&t=56s

Lupu, I. & Sandu, R. (2017) “Intertextuality in corporate narratives: a discursive analysis of a contested privatization”, *Accounting, Auditing & Accountability Journal*, vol. 30, no.3: 534-564

Mediafax (2009, February 13) „Petrom recomandă angajaților care au câștigat procese împotriva companiei să returneze banii”, *Mediafax*, available on-line at https://www.mediafax.ro/economic/petrom-recomanda-angajatilor-care-au-castigat-procese-impotriva-companiei-sa-returneze-banii-3912388?p=2

Meglino, B.M. & Ravlin, E.C. (1998) “Individual values in organizations: Concepts, controversies, and research”, *Journal of Management*, vol. 24: 351-389

Nicolae, R. (2007, December 11) „Mariana Gheorghe – ‘Veștile bune nu vin noaptea…’”, *Cariere*, available on-line at https://revistacariere.ro/leadership/oameni-care-ne-inspira/mariana-gheorghe- vestile-bune-nu-vin-noaptea/

OMV Petrom (2010) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147458079/petro m-group-annual-report-2010.pdf

OMV Petrom (2010) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147452016/petro m-group-annual-report-2011.pdf

OMV Petrom (2014) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147434452/omv- petrom-group-annual-report-2014.pdf

OMV Petrom (2015) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147430961/omv- petrom-group-annual-report-2015.pdf

OMV Petrom (2016) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147427746/annua l-report-omv-petrom-group-2016.pdf

OMV Petrom (2017) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147418729/annua l-report-omv-petrom-group-2017-en-2.pdf

Petrom (2006) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147481402/petro m-annual-report-2006.pdf

Petrom (2008) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147468581/petro m-annual-report-2008.pdf

Petrom (2009) „Annual report”, available on-line at https://www.omvpetrom.com/services/downloads/00/omvpetrom.com/1522147463985/petro m-annual-report-2009.pdf

PRO TV (2009, January 28) „Petrom disponibilizează din 1 februarie 3.000 de angajați”, *PRO TV*, available on-line at https://stirileprotv.ro/stiri/social/petrom-disponibilizeaza-din-1-februarie-3-000-de- angajati.html

Ziarul Financiar (2009, August 8) „Mariana Gheorghe, Petrom: Mergem înainte cu restructurarea până atingem productivitatea dorită”, *Ziarul Financiar*, available on-line at https://www.zf.ro/burse-fonduri-mutuale/mariana-gheorghe-petrom-mergem-inainte-cu- restructurarea-pana-atingem-productivitatea-dorita-4723768

SECTION 4 Sustainability 2

Effects and Limitations of the Implementation of the Non-Financial Reporting Directive (2014/95/EU)

Ningshan Hao

Voicu D. Dragomir

Research on Corporate Governance in Sensitive Industries: A Fifteen-Year Evidence

Andreea-Mădălina Bojan

Camelia Iuliana Lungu

Chirața Caraiani

Integrated Reporting – Means of Improving Stakeholder Communication Process

Lăcrămioara Mansour

Elena Dobre

Elena Cerasela Spătariu

Effects and Limitations of the Implementation of the Non-Financial Reporting Directive (2014/95/EU)

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Abstract: **Idea:** *This article investigates the increasing significance of the sustainability orientation in corporate operations, as well as the function of non-financial reporting (NFR) in providing information about social, ethical, and environmental aspects of a particular organization. Additionally, the article explores the possible benefits of sustainability reporting, such as improved reputation, in addition to the company's ability to contribute to the sustainable development goals.* **Data and tools:** *The present literature review explores the influence of non-financial reporting (NFR) on the decisions of various stakeholders, such as investors, companies, governments/regulators, accountants and auditors, employees, and the general public. The adoption of NFR is discussed from the perspective of each stakeholder group, highlighting the positive and negative implications.* **What's new?** *Companies are now mandated to disclose information on environmental, social, and governance (ESG) concerns, as the article indicates that non-financial reporting has evolved into an essential component of corporate reporting. However, the lack of a consistent reporting methodology and assurance has raised doubts about the quality of NFR and its ability to generate comparable data.* **So what?** *It is essential to be aware that the Corporate Sustainability Reporting Directive (EU) 2022/2464 imposed new disclosure obligations on businesses, according to the size of the company, the number of employees, and the revenue it generates. This regulation aims to increase the consistency and reliability of sustainability reporting within the European Union. It also reflects the central role of sustainable strategies within the operations of businesses.* **Contribution:** *This article highlights the importance of sustainability reporting in increasing stakeholder participation, safeguarding business reputation, and working toward achieving the sustainable development goals. It explores the challenges and opportunities involved with non-financial reporting and specifies the necessary components of sustainability reporting frameworks.*

Keywords: *Non-financial reporting, sustainability reporting, Corporate Sustainability Reporting Directive, European Union, ESG performance.*

1. Introduction

A mindset focused on sustainability in the day-to-day operations of a business is gradually becoming vital for corporate survival. An increasing number of businesses are aware of the potential benefits that could be gained by doing so. Information regarding the social, environmental, and ethical impacts of a firm is referred to as non-financial information (NFI). By using such information, stakeholders can assess not

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only the long-term survival of the organization but also the potential risks and opportunities it faces (Venturelli *et al.*, 2022).

A comparative analysis of non-financial reporting (Krištofík *et al.*, 2016) found that it has the potential to meet the needs of stakeholders, improve the company's reputation and brand value, and serve as a tool to achieve the sustainable development objectives. These benefits can be gleaned from the fact that sustainability reporting has the role of meeting the needs of various stakeholders. The ability of the non-financial report to satisfy the requirements of stakeholders is the source of numerous positive aspects. NFI disclosures are a lens on environmental, social, and governance aspects (commonly known as ESG), which have become essential components of sustainability reporting over the course of recent years.

In recent years, reporting on topics other than financial performance has become an integral aspect of the reporting process in organizations. This change occurred as a result of the increasing importance of such reporting. Businesses are forced to comply with an increasing number of regulations and standards that require them to disclose information regarding environmental, social, and corporate governance concerns. On the other hand, the quality and assurance of NFI is frequently questioned due to the absence of a defined reporting framework and methodology. This is the case even though NFI is frequently used. Investors, securities regulators, and financial markets are concerned about the NFI's capacity to justify the 'sustainability' attribute of business strategies (Aureli *et al.*, 2020).

Directive 2014/95/EU, also known as the Non-Financial Reporting Directive, is an important legislation enacted by the European Union (EU) in 2014. The aim of this directive is to enhance transparency and sustainability in the corporate sector. It requires large companies ("public-interest entities") to disclose non-financial information, such as environmental impact, social responsibility, and corporate governance practices. The directive emphasizes the significance of integrating ESG considerations into business strategies and decision-making processes. By promoting NFR, it enables stakeholders, including investors, employees, and the public, to gain a comprehensive understanding of a company's environmental and social performance. This directive plays a crucial role in fostering responsible business conduct and promoting sustainable development within the EU.

According to Directive (EU) 2022/2464, environmental considerations for a corporation must take into account its carbon emissions, the quantity of resources it consumes, and the manner in which it handles its waste. Examples of social aspects include a company's interactions with its employees, customers, and suppliers, as well as with communities affected by the activities of that company. Social aspects also include the communities that are impacted by the activities of the company. In the context of an organization's performance and sustainability goals, the phrase 'governance considerations' refers to the administration and monitoring of an organization, including the company's internal controls and regulations. When reporting on topics other than finances, companies must strike a delicate balance between the need to be transparent and the desire to provide information that is relevant to the readers (Venturelli *et al.*, 2022).

A better understanding of the long-term risks and prospects of a company can be achieved by integrating environmental, social, and governance (ESG) factors into finance research (Arif *et al.*, 2022). When assessing the ESG performance of companies, a comparative study of sustainability reporting is an important tool that should be used (Dumitru *et al.*, 2017). By comparing the sustainability reports of various companies, stakeholders can receive insight into how organizations address sustainability concerns, the efficacy of their sustainability policies, and how they compare with their industry counterparts. This can be accomplished by contrasting the numerous sustainability reports submitted by firms (Dragomir *et al.*, 2022).

Previous literature has not provided a literature review of the advantages and disadvantages of NFR for different categories of stakeholders. This is a gap in the literature that the present article seeks to address. We provide an up-to-date literature review of the factors that influence non-financial reporting (NFR) for various stakeholders, such as investors, companies, governments/regulators, the general public, accountants and auditors, and employees. The regulatory setting refers to the European Union after 2017, the first year of adoption of Directive 2014/95/EU. The origins of NFR are discussed in this article, as well as the effects that legislation has had on the organization's ability to release information and fulfill its responsibilities. In addition, the article evaluates the positive effects of mandatory NFR on the ESG performance of firms and analyzes how companies might benefit from national laws and European directives on this matter.

The structure of the present research is as follows. Based on a review of the recent literature, this article offers insight into the factors that influence NFR practices among various stakeholders, each discussed in a dedicated section. At the end of the article, we include a presentation of the implications of the new Corporate Sustainability Reporting Directive on the strengthening of sustainability reporting within the European Union.

2. Advantages and pitfalls of NFR for investors

Disclosures related to environmental, social, and governance (ESG) can help financial analysts make better decisions by providing them with information that is helpful for the preparation of profit projections (Chouaibi *et al.*, 2021). In the field of sustainable finance, ESG is also considered a fundamental concept. In recent years, an increasing number of investors and analysts have realized the need to factor non-financial considerations into investment decisions, bringing increased attention to ESG factors. These variables include environmental, social, and governance (ESG) factors (Arif *et al.*, 2022). Sustainability considerations are applied to the task of assessing the effects that an organization's activities have on society and the natural environment.

NFR is able to provide information on how an organization operates in terms of the economic, social, and environmental dimensions of sustainable development. Furthermore, NFR assists the company in creating a comprehensive picture of organizational performance (Venturelli *et al.*, 2022). This can help investors and other stakeholders evaluate a firm's commitment to sustainable practices and the influence that the company has on the community at large.

Supplying potential and present investors with accurate and reliable data on a company's non-financial performance can reduce information asymmetry in the capital market. This is accomplished through the process of non-financial reporting and has the potential to make the company more appealing to investors, to optimize its financing costs, and to raise its value. NFR also has the potential to increase the transparency of company activities, which in turn can increase investor trust (Caputo *et al.*, 2019).

ESG data can be used by financial analysts to recognize risks and opportunities that are not reflected in conventional financial statements. This information is used to adjust future earnings forecasts, taking into account the possibility of regulatory hazards, and to locate investment opportunities. Disclosures about ESG factors can also shed light on the quality of management, the strength of the company's relationships with its stakeholders, and the company's ability to manage social and environmental risks and opportunities.

Disclosures of ESG factors provide sustainability information to financial analysts and investors for use in decision making. Financial analysts can have a better understanding of the long-term prospects of a firm and support more educated investment decisions when they incorporate ESG aspects into their analyses (Arif *et al.*, 2022). According to Krištofík *et al.* (2016), investors can consider certain businesses as more attractive investment opportunities when they assess a strong commitment to sustainability. On the other hand, investors will avoid a riskier investment if a business falls behind its rivals in terms of how well it addresses sustainability challenges.

The value of NFI has increased in recent years for investors and other decision makers who are looking to make informed decisions. However, the lack of uniformity, dependability, and comparability of the NFI presents a problem for the users in question. Researchers (Ştefănescu, 2022) have come to the conclusion that the reported information on non-financial factors is not sufficiently comparable or credible, and that there is no universal definition of NFI and no reliable ESG reporting system. Due to the lack of standardization, data comparison and interpretation presents challenges for investors and financial analysts.

Businesses do not report all non-financial data that consumers consider to be necessary, and many companies report data that users do not consider to be relevant. Because of this, it is difficult to compare the performance of different companies in a meaningful way. Aluchna *et al.* (2022) emphasize that the voluntary approach to NFI reporting damages its credibility and can result in inconsistent and insufficient reporting by enterprises. By regulating CSR reporting, the European Union can help reduce the flaws of voluntary reporting, improve the quality of reporting, and boost the legitimacy of corporate sustainability policies. This can also connect the non-financial performance of a firm with the financial outcomes, which can provide investors with a more thorough picture of the holistic performance of the organization (Zarzycka and Krasodomska, 2022).

To overcome these challenges, companies should conduct the NFR in a more structured format and obtain assurance for their reports. Companies are under increasing pressure from investors, regulators, and the securities markets to improve the quality, comparability, and credibility of their NFI. Businesses have a responsibility to report as much NFI as necessary while simultaneously avoiding NFR that is not relevant or serves a greenwashing purpose (Kurpierz and Smith, 2020). Assessment of double materiality (societal and financial impact) is crucial in this regard (Baumüller and Sopp, 2022). This would make the NFI more comparable and reliable, which in turn would boost its utility for investors and other stakeholders (Krištofík *et al.*, 2016).

For investors and other stakeholders, the absence of standardization, dependability, and comparability of the NFI is a considerable challenge. A more structured and standardized reporting and assurance model is required to improve the quality of NFI and its usefulness. To build a common definition and reporting structure for NFI, companies, regulators, and other stakeholders will need to bring together knowledge and technical resources (Venturelli *et al.*, 2022).

3. Companies' contribution to the credibility of ESG disclosures

Recent studies (Arif *et al.*, 2022) claim that environmental, social, and governance (ESG) disclosures act as a tool to reduce information asymmetry, increase investor confidence, and improve organizations' communication with internal and external stakeholders. According to the findings of Aureli *et al.* (2020), the mandatory NFI has the potential to improve both the quality of the reporting and its credibility. It can also limit the use of environmental, social, and governance disclosure as a strategy for legitimation, considering that businesses have a tendency to modify the Global Reporting Initiative (GRI) indicators to make them fit their own legitimacy needs (Aluchna *et al.*, 2022). According to the NFRD, companies are free to select both the manner in which they disclose information and the subject matter of those disclosures (Ştefãnescu *et al.*, 2020).

ESG factors can have an effect on the performance, reputation, and brand value of an organization, all of which have the potential to affect the organization's financial performance. For example, if a company has a poor track record in environmental protection, it can be subject to regulatory fines and reputational harm. Both factors can have a negative impact on the company's financial performance, in the present and in the future (Arif *et al.*, 2022).

According to the findings of several studies, environmentally sensitive industries are more likely to provide comprehensive social and environmental disclosure (Aureli *et al.*, 2020; Manes-Rossi *et al.*, 2018). Voluntary NFR, on the other hand, can be a barrier to comparability and open the door to symbolic practices that can undermine the credibility of ESG data (Aureli *et al.*, 2020). As a result, mandatory disclosure requirements and standards can make it easier for business managers to fulfill their obligations to provide consistent and reliable information to their stakeholders about the company's efforts to address environmental, social, and governance concerns (Arif *et al.*, 2022).

According to Krištofík *et al.* (2016), the process of performing due diligence (as stipulated in ESRS 1, para. 62-63) can be of assistance to firms in determining the areas of their sustainability performance and establishing improvement objectives and priorities. The performance of an organization's sustainability efforts can be compared with that of its peers, and the resulting information can be used to determine areas where the organization can improve and develop sustainable strategies. However, if the ESG reporting framework is too extensive and complicated, it can cause stakeholders to become confused (Aureli *et al.*, 2020) and miss important information on sustainability.

Significant expenses are incurred throughout the compilation of the NFI (Venturelli *et al.*, 2022). Businesses must choose the reporting scope, ratios to disclose, and presentation formats (Krištofík *et al.*, 2016). Doing so is a difficult and time-consuming process. As the pressure on companies to report more NFI increases, it may become difficult for managers and accountants to strike a balance between the need to disclose information and the desire to maintain a positive image for the company. Companies could also respond to this challenge by only disclosing the positive aspects of their ESG performance while concealing the negative aspects of their performance (Aluchna *et al.*, 2022). This practice has the potential to create an inaccurate picture of a company's performance and undermine the credibility of sustainability reports.

Companies have a propensity to disclose only favorable information about their environmental or social performance, which can result in an overly favorable public image (Aluchna *et al.*, 2022). Furthermore, businesses tend to adapt and change GRI indicators according to the legitimation interests they have at any moment (Aluchna *et al.*, 2022). A reporting framework that is flexible can make it more difficult to achieve harmonization and compare different types of non-financial information. Additionally, regulation alone is insufficient to guarantee the successful and meaningful implementation of rules and standards, since the personal values and beliefs of managers play a significant role in the adoption of practices related to sustainability (Lombardi *et al.*, 2022).

The information that is reported would become more consistent and comparable if NFR was mandatory. This could lead to an improvement in the quality of disclosures (Arif *et al.*, 2022). The importance of mandatory disclosure requirements was demonstrated by the slow but steady progress that Romanian companies have been making in reporting and disclosing non-financial sustainability indicators (Beleneși *et al.*, 2021). However, the increase in overall reporting quality after the introduction of mandatory sustainability reporting suggests that such disclosure can be beneficial for companies, their stakeholders, and the environment. NFI disclosures are still voluntary in countries that are not part of the EU (Arif *et al.*, 2022; Ottenstein *et al.*, 2022).

4. The role of governments and regulators in advancing NFR

Mandatory disclosure of non-financial sustainability indicators has the potential to solve the problem of information asymmetry, to enhance the credibility of environmental, social, and governance (ESG) data, and to mitigate concerns regarding corporate legitimacy (Beck *et al.*, 2017). The European Commission (EC) has developed a framework to assist large companies in meeting the requirements of the EU Directive for Non-Financial Reporting (NFR) and to ensure that their respective reports are consistent and comparable. According to the percentage of companies in Europe's 50 largest by market capitalization that comply with regulations, NFR should be required for all of Europe's publicly traded companies (Manes-Rossi *et al.*, 2018).

Report comparability is an important qualitative attribute of the NFI because it supports the development of reporting standards and guidelines at the international, national, industry, or micro level. As a result of this, stakeholders can assess the degree to which companies report on different aspects of sustainability, such as human rights, environmental impact, and corporate governance (Krištofík *et al.*, 2016). This information can then be used to develop sustainability analytics that help stakeholders in sustainable decision making (Beleneși *et al.*, 2021).

This is despite the fact that regulation does not always result in an improvement in NFR quality (Caputo *et al.*, 2019; La Torre *et al.*, 2020). Researchers have raised concerns about the inefficiency and inability to improve the quality of NFR in relation to the Non-Financial Reporting Directive (NFRD). It was argued by Ștefănescu *et al.* (2020) that the NFRD does not impose sanctions for its non-implementation, which may cause businesses to operate in an unregulated environment. Furthermore, Caputo *et al.* (2019) discovered that early adopters of the Directive's legal requirements had less compliance difficulties than late adopters.

The reporting requirements of the Directive have been criticized for being static and traditional, and there is no specific guidance regarding which frameworks and guidelines should be used for non-financial reporting. This has led to criticism of the reporting requirements of the Directive. Samani *et al.* (2023) pointed out that the Directive and its reporting requirements have a long way to go before they can harmonize NFR and achieve information comparability in Europe. The adoption of a flexible reporting framework calls into question the ability of the Directive to achieve the goal of harmonization and comparability of non-financial information.

Researchers have advocated for the implementation of mandatory disclosure rules backed by stringent enforcement measures in order to enhance the quality of non-financial disclosure. Aluchna *et al.* (2022) argued that if companies were required by law to disclose information related to ESG issues, those companies would limit their reporting practices to the bare minimum required for compliance. Ottenstein *et al.* (2022) found that regulations do not have a significant effect on reporting quality and that the NFRD has not improved reporting quality. Furthermore, they found that the NFRD has not improved the reporting quality.

5. Enhancing the credibility of NFR for the general public

There are multiple interpretations of the company's commitment to environmentally, socially, and economically responsible growth. Caputo *et al.* (2019) emphasize the significance of enhancing the transparency of a company's operations as a means of reducing information asymmetry in the stock market (Aluchna *et al.*, 2022). Additionally, mandatory NFR has the potential to improve the overall quality of sustainability reporting and the company's credibility in the eyes of investors (Aureli *et al.*, 2020). When NFI is included in company reports, it can increase transparency on social and environmental issues and provide a fuller picture of organizational performance (Sierra-Garcia *et al.*, 2018). Moreover, mandatory NFI can facilitate the provision of accurate and consistent information regarding ESG issues (Arif *et al.*, 2022). With its extensive history of advancing NFI best practice, GRI will facilitate the transition to sustainability in organizations (La Torre *et al.*, 2020). In conclusion, NFR is an essential instrument for enabling organizational change for sustainability and increasing public awareness, thus elevating the importance of ESG issues within the organization (Aluchna *et al.*, 2022).

6. The evolving role of accountants and auditors in relation to NFR

The realization that the quality of the NFI should be comparable to financial data is the source of the pressure placed on the industry. Investors are increasingly incorporating ESG data into their deliberation processes. To support their investment decisions, they require non-financial information that is of high quality, reliable and comparable. The importance of the NFI in determining whether a company will be resilient and sustainable in the long term has also been recognized by markets and financial regulatory bodies.

One of the many advantages of the NFRD is that it allows stakeholders to conduct comparative analyses of ESG data. This enables companies to evaluate their own performance in relation to that of their rivals (Krištofík *et al.*, 2016). Integrated reports, which consolidate both financial and non-financial data, are becoming increasingly popular among organizations, which is another advantage. This trend results in disclosures that are clearer and more concise (Manes-Rossi *et al.*, 2018). Additionally, auditing firms are adapting their service offerings to provide limited assurance in a variety of fields that are outside the scope of the statutory audit (Krasodomska *et al.*, 2021).

However, the NFRD has several drawbacks, the most significant of which is the absence of standardization in the process of external verification of non-financial statements. This lack of standardization leads to the publication of reports that cannot be compared with one other (Krištofík *et al.*, 2016; Ştefănescu *et al.*, 2020). Additionally, the NFRD does not require stringent disclosure rules or a minimum amount of information that must be disclosed, resulting in ambiguity about what constitutes material information (Ştefănescu *et al.*, 2020). A second issue is that the information provided in such reports can be inadequate, inaccurate, biased, subjective, or manipulative (Caputo *et al.*, 2019).

To mitigate the effects of these drawbacks, businesses should seek third-party verification of NFI regarding their operations (Krasodomska *et al.*, 2021). This assurance can be helpful in improving the precision, objectivity, and comparability of the non-financial reports. Companies are required to disclose sufficient and material information to clear up any confusion that may arise as a result of the lack of stringent disclosure rules in the NFRD.

7. The impact of the NFRD on the reporting of employee-related topics

Companies' methods of reporting on employee-related topics have been significantly improved as a result of the NFRD, which was enacted in response to growing concerns about the transparency and accountability of corporations. In particular, Swedish businesses have improved their reporting on employee matters as a response to the directive, illustrating the positive effect that regulatory measures may have in promoting corporate responsibility (Aluchna *et al.*, 2022).

One of the advantages of the NFRD is that it encourages firms to take sustainability-related information into account as part of their overall business strategy and helps raise employee awareness of the NFI. This directive also mandates additional risk descriptions to be included in non-financial reports. This is particularly important in circumstances where there is no alternative governance mechanism, such as employee representation, ensuring that employee-related concerns are appropriately considered during the decision-making process (Samani *et al.*, 2023). However, the NFRD may not have the effect that was intended if employees are not effectively represented in board processes. Substantive measures must be implemented to ensure that employees are fully involved in the reporting process (Samani *et al.*, 2023).

Businesses must take a more methodical approach to NFR and related assurance if they intend to keep up with the growing demand. This comprises the creation of a standard reporting framework, the deployment of assurance methods, and the improvement of the quality and comparability of the NFI. In addition to ensuring that their NFI is meaningful to stakeholders, businesses are required to disclose any relevant information in a transparent and accountable manner.

8. The improvements brought by the new Corporate Sustainability Reporting Directive

Large companies with their headquarters in the EU (with more than 500 employees) were required to report on non-financial information, including ESG factors, in accordance with the 2014/95/EU Directive on Non-Financial Reporting. This directive was issued by the European Union. The Directive (EU) 2022/2464, which will be abbreviated as CSRD from this point forward, widened the criteria for mandatory sustainability reporting and made its requirements stricter. The new directive requires that all large companies, regardless of the type of legal structure under which they operate, report on sustainability aspects. In addition, the definition of large companies has been broadened to include organizations that have more than 250 employees. In addition to this, small and medium-sized businesses are strongly encouraged to voluntarily report their performance in the area of sustainability. Listed SMEs will have the obligation to issue a sustainability statement starting with 2026.

CSRD also establishes reporting requirements that are more specific, such as the disclosure of data on environmental, social, and governance initiatives and outcomes in a predetermined format. Companies are required to report on their ESG policies, due diligence processes, outcomes, and risks associated with sustainability issues. These issues include climate change, resource depletion, human rights, social issues, and anti-corruption. In addition, the CSRD requires companies to report on their performance in terms of sustainability at the separate and consolidated level. This provides stakeholders with a comprehensive view of the companies' performance in terms of sustainability.

The term 'non-financial reporting' has been replaced in the CSRD by the term 'sustainability reporting.' This change is meant to reflect the all-encompassing nature of sustainability reporting, which includes financial and non-financial aspects, which is closer to the construct of ESG. This change is also a reflection of the growing recognition among stakeholders of the significance of sustainability reporting for the long-term performance of sustainability initiatives undertaken by companies.

User confidence can be damaged if there is a lack of a shared understanding and definition of NFI, as well as deficiencies in report quality and a lack of assurance (La Torre *et al.*, 2020). Companies were required to disclose their environmental, social, and governance (ESG) performance prior to the CSRD, but the guidelines lacked specific reporting requirements and methods. As a consequence, the NFI provided by the companies was of varying quality and was not comparable, making it difficult for various stakeholders to use the information as a basis for decision-making. Furthermore, the lack of specific reporting guidelines (with the exception of the GRI) made it difficult for companies to report information accurately and consistently.

After the amendments provided by the CSRD, the new set of standards issued by EFRAG will provide in-depth guidelines for reporting on the sustainability of corporations. Inclusion of specific reporting requirements and methodologies helps increase the comparability and transparency of corporate sustainability information. The new set of standards requires businesses to report not only on their ESG performance, but also on their business strategy, risk management, and the financial impact of sustainability policies.

Before the CSRD, businesses were not required to obtain independent assurance for their sustainability reports. The reliability of the sustainability information reported by companies varied greatly, making it difficult for stakeholders to make decisions based on accurate information. In addition, businesses were not required to disclose the level of assurance they had obtained or the scope of the audit engagement. This changed after the CSRD was passed. The process of validating the information contained in sustainability reports and expressing an opinion on the dependability and accuracy of that information is referred to as independent assurance.

There are many different types of stakeholders that are interested in sustainability reporting, including investors, customers, employees, civil society organizations, and regulatory bodies. Investors can evaluate the sustainability performance and associated risks of a company using ESG analytics (Refinitiv, 2022), while consumers can use it to decide what products to buy. The ESG performance of a company is of interest to employees due to its reputational effect (Murè *et al.*, 2021). Civil society organizations and regulatory bodies make use of ESG information to monitor and, respectively, enforce relevant regulations. Information is used by civil society organizations to advocate for issues related to sustainability.

In conclusion, Directive (EU) 2022/2464 provides a comprehensive framework for corporate sustainability reporting. This is achieved by introducing a new set of reporting standards, new assurance requirements, stakeholder participation, and new terminology. Regulators hope that the implementation of these changes will result in increased credibility, comparability, and relevance of sustainability reporting. This, in turn, will enable stakeholders to make decisions based on accurate information and encourage more sustainable business practices.

9. Conclusions

Non-financial reporting, a synonym of ESG reporting, is an indispensable element for businesses that want to increase the transparency and accountability of their non-financial performance. It fosters investor confidence, provides a more complete picture of organizational performance, reduces information asymmetries, and provides a sustainable (green and ethical) orientation for investments. Reporting on corporate social responsibility should be regulated so that it can help overcome the limitations of voluntary reporting, improve the quality of reporting, and ultimately boost confidence among investors.

The NFRD was a huge step towards increased reporting and transparency on sustainability aspects in businesses. Despite the fact that there are still some hurdles to overcome, research has shown that the directive has had a positive impact on the way companies disclose information related to sustainability (Arif *et al.*, 2022). However, concerns about the effectiveness of the NFRD approach to disclosure formats and content support the idea that mandatory reporting frameworks are necessary. A reform of accounting and reporting centered on accountability is inextricably linked to relevant regulations and a higher-level strategy such as the European Green Deal.

It is necessary to use a method that is formal and standardized when reporting and ensuring the accuracy of NFI. This will allow investors and securities regulators to make informed decisions based on information that is reliable and comparable. Companies are required to acknowledge the importance of NFI in assessing their long-term sustainability and resilience, and they are also required to take proactive measures to improve the quality and assurance of NFI (Krasodomska *et al.*, 2021).

The provision of limited NFI assurance does not in and of itself guarantee that sustainability information is accurate or comprehensive (Ştefãnescu *et al.*, 2020). Despite the cost burden of assurance, the importance of reporting on matters other than financial performance cannot be overstated. It is an essential instrument for companies to illustrate their commitment to environmental sustainability and social responsibility, and it can also gain trust among stakeholders. However, for NFR to be useful, businesses need to disclose their activities in a transparent and complete manner, providing accurate, timely, and comparable information on how they perform on ESG matters. In conclusion, despite the fact that NFR may have some drawbacks, it continues to be an essential component of corporate reporting and a necessary instrument to promote sustainable and socially responsible business practices.

A potential future improvement for this scientific article would be to conduct a systematic literature review. Adopting a systematic approach can ensure a comprehensive and unbiased assessment of the existing literature on non-financial reporting, “acknowledging all pertinent papers in the field”. This methodology would involve clearly defining the research questions, establishing inclusion and exclusion criteria, conducting a thorough search across multiple databases, screening and selecting relevant studies, and critically analyzing and synthesizing the findings. A systematic literature review would enhance the rigor and validity of the paper, providing a solid foundation for identifying gaps, highlighting key insights, and making meaningful contributions to the field of non-financial reporting research.

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References

Aluchna, M., Roszkowska-Menkes, M., & Kamiński, B. (2022) From talk to action: The effects of the non-financial reporting directive on ESG performance, *Meditari Accountancy Research*, vol. 31, no. 7: 1-25, https://doi.org/10.1108/MEDAR-12-2021-1530

Arif, M., Gan, C., & Nadeem, M. (2022) Regulating non-financial reporting: Evidence from European firms' environmental, social and governance disclosures and earnings risk, *Meditari Accountancy Research*, vol. 30, no. 3: 495-523, https://doi.org/10.1108/MEDAR-11-2020-1086

Aureli, S., Salvatori, F., & Magnaghi, E. (2020) A country-comparative analysis of the transposition of the EU Non-Financial Directive: An institutional approach, *Accounting, Economics, and Law: A Convivium*, vol. 10, no. 2: 20180047, https://doi.org/10.1515/ael-2018-0047

Baumüller, J., & Sopp, K. (2022) Double materiality and the shift from non-financial to European sustainability reporting: Review, outlook and implications, *Journal of Applied Accounting Research*, vol. 23, no. 1: 8-28, https://doi.org/10.1108/JAAR-04-2021-0114

Beck, C., Dumay, J., & Frost, G. (2017) In pursuit of a 'single source of truth': From threatened legitimacy to integrated reporting, *Journal of Business Ethics*, vol. 141, no. 1: 191-205, https://doi.org/10.1007/s10551-014-2423-1

Beleneşi, M., Bogdan, V., & Popa, D.N. (2021) Disclosure dynamics and non-financial reporting analysis. The case of Romanian listed companies, *Sustainability*, vol. 13, no. 9: 4732, https://doi.org/10.3390/su13094732

Caputo, F., Leopizzi, R., Pizzi, S., & Milone, V. (2019) The non-financial reporting harmonization in Europe: Evolutionary pathways related to the transposition of the Directive 95/2014/EU within the Italian context, *Sustainability*, vol. 12, no. 1, https://doi.org/10.3390/su12010092

Chouaibi, Y., Rossi, M., & Zouari, G. (2021) The effect of corporate social responsibility and the executive compensation on implicit cost of equity: Evidence from French ESG data, *Sustainability*, vol.13, no. 20: 11510, https://doi.org/10.3390/su132011510

Dragomir, V.D., Dumitru, M., & Feleagă, L. (2022) The predictors of non-financial reporting quality in Romanian state-owned enterprises, *Accounting in Europe*, vol. 19, no. 1: 1-42, https://doi.org/10.1080/17449480.2021.2018474

Dumitru, M., Dyduch, J., Guşe, R.G., & Krasodomska, J. (2017) Corporate reporting practices in Poland and Romania – An ex-ante study to the new non-financial reporting European directive, *Accounting in Europe*, vol. 14, no. 3: 279-304, https://doi.org/10.1080/17449480.2017.1378427

Krasodomska, J., Simnett, R., & Street, D. L. (2021) Extended external reporting assurance: Current practices and challenges, *Journal of International Financial Management & Accounting*, vol. 32, no. 1: 104-142, https://doi.org/10.1111/jifm.12127

Krištofík, P., Lament, M., & Musa, H. (2016) The reporting of non-financial information and the rationale for its standardization, *E+M Ekonomie a Management*, vol. 19, no. 2: 157-175, https://doi.org/10.15240/tul/001/2016-2-011

Kurpierz, J. R., & Smith, K. (2020) The greenwashing triangle: Adapting tools from fraud to improve CSR reporting, *Sustainability Accounting, Management and Policy Journal*, vol. 11, no. 6: 1075-1093, https://doi.org/10.1108/SAMPJ-10-2018-0272

La Torre, M., Sabelfeld, S., Blomkvist, M., & Dumay, J. (2020) Rebuilding trust: Sustainability and non-financial reporting and the European Union regulation, *Meditari Accountancy Research*, vol. 28, no. 5: 701-725, https://doi.org/10.1108/MEDAR-06-2020-0914

Lombardi, R., Cosentino, A., Sura, A., & Galeotti, M. (2022) The impact of the EU Directive on non-financial information: Novel features of the Italian case, *Meditari Accountancy Research*, vol. 30, no. 6: 1419-1448, https://doi.org/10.1108/MEDAR-06-2019-0507

Manes-Rossi, F., Tiron-Tudor, A., Nicolò, G., & Zanellato, G. (2018) Ensuring more sustainable reporting in Europe using non-financial disclosure – De facto and de jure evidence, *Sustainability*, vol. 10, no. 4: 1162, https://doi.org/10.3390/su10041162

Murè, P., Spallone, M., Mango, F., Marzioni, S., & Bittucci, L. (2021) ESG and reputation: The case of sanctioned Italian banks, *Corporate Social Responsibility and Environmental Management*, vol. 28, no. 1: 265–277, https://doi.org/10.1002/csr.2047

Ottenstein, P., Erben, S., Jost, S., Weuster, C.W., & Zülch, H. (2022) From voluntarism to regulation: Effects of Directive 2014/95/EU on sustainability reporting in the EU, *Journal of Applied Accounting Research*, vol. 23, no. 1: 55-98. https://doi.org/10.1108/JAAR-03-2021-0075

Refinitiv. (2022) *Environmental, social and governance scores from Refinitiv*, available at https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

Samani, N., Overland, C., & Sabelfeld, S. (2023) The role of the EU non-financial reporting directive and employee representation in employee-related disclosures, *Accounting Forum*, vol. 47, no. 2: 278-306, https://doi.org/10.1080/01559982.2022.2158773

Sierra-Garcia, L., Garcia-Benau, M., & Bollas-Araya, H. (2018) Empirical analysis of non-financial reporting by Spanish companies, *Administrative Sciences*, vol. 8, no. 3: 29, https://doi.org/10.3390/admsci8030029

Ştefãnescu, C.A. (2022) Linking sustainability and non-financial reporting directive 2014/95/EU through isomorphism lens, *Meditari Accountancy Research*, vol. 30, no. 6: 1680-1704, https://doi.org/10.1108/MEDAR-09-2020-1019

Ştefãnescu, C.A., Tiron-Tudor, A., & Moise, E.M. (2020) EU non-financial reporting research – Insights, gaps, patterns and future agenda, *Journal of Business Economics and Management*, *22*(1), 257-276, https://doi.org/10.3846/jbem.2020.13479

Venturelli, A., Fasan, M., & Pizzi, S. (2022) Guest editorial. Rethinking non-financial reporting in Europe: Challenges and opportunities in revising Directive 2014/95/EU. *Journal of Applied Accounting Research*, vol. 23, no. 1: 1-7, https://doi.org/10.1108/JAAR-02-2022-265

Zarzycka, E., & Krasodomska, J. (2022) Non-financial key performance indicators: What determines the differences in the quality and quantity of the disclosures? *Journal of Applied Accounting Research*, vol. 23, no. 1: 139-162, https://doi.org/10.1108/JAAR-02-2021-0036

Research on Corporate Governance in Sensitive Industries: A Fifteen-Year Evidence

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Abstract: *This study focuses on corporate governance in sensitive industries research, presenting an analysis of publications' structure and main themes approached by scholars during the time frame 2008 - 2022. Bibliometric techniques are combined with statistical analysis performed in SPSS software and network analysis projected in VOS viewer, to outline the findings debated in the context of previous and future research horizons. A total of 926 scientific publications from the Web of Science database are examined to answer research questions. First, the dynamic of publications is addressed by delineating the time frame into crisis and non-crisis periods, while the search string highlighted the interest for each industry. Second, descriptive analysis allows to examine the better documented, more cited, and more extensive papers. Next, the scientific collaboration between authors and universities is examined through an in-depth analysis of network graphs, together with co-occurrence of author keywords. The results emphasize that most of the papers are published in leading journals, while 2022 is the year that stands out with the highest number of publications. The research focus, from business field point of view, is on Banking, Energy, Logistic, Pharmaceutical, and Tourism industries. Muchmore, statistical analysis demonstrates that there is a significant difference between the types of publications. This study may be of great interest to academic and business environments. On the one hand, it represents a useful resource for researchers and students. On the other hand, it summarizes information for a specific topic, whose evolution managers and practitioners are interested in.*

Keywords: *Corporate governance, sensitive industries, statistical analysis, network analysis, crisis conditions.*

1. Introduction

The dynamics of the macroeconomic environment and the multitude of socio-political, demographic, and cultural transformations determine, at a global level, the need for increased adaptability of the business environment. Among the decisions adopted by the companies, there is the consolidation and application of corporate governance principles, considered beneficial for the development of long-term business plans and strategies. According to existing opinions in the literature, if corporate governance is adapted to the specifics of the activity and the geographical regions where the companies are located, then value creation increases (Almashhadani H.A. and Almashhadani M., 2022).

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Constantinescu *et al.* (2021) and Wicaksono *et al.* (2019) emphasize the increased interest of investors towards the coexistence of financial and non-financial data in company's reports. The presentation of non-financial data is supported by environmental, social and governance factors disclosure, because their aim is to propose long-term evolutionary perspectives. Corporate governance refers to the guarantee to the providers of financing sources that the investments made are profitable. Moreover, the adoption of governance leads to the reduction of agency costs, based on the interdependencies between the shareholding structure and management, characterized by a set of common purposes.

The main purpose of this study is to approach a fifteen-year evidence for research on corporate governance in sensitive industries, contributing to a better understanding of publications' dynamics, interest of scholars in specific business sectors, key characteristics of papers, and scientific collaboration. Research methodology, based on studies conducted by Cumming *et al.* (2023), Zou *et al.* (2023), Baker *et al.* (2020), Lungu *et al.* (2020) and Caraiani *et al.* (2018), combines bibliometric analysis with frequency, descriptive and statistics analysis. Descriptive statistics allow to identify the characteristics of the studies, while network analysis techniques provide an overview of collaboration between authors and universities, as well as the most addressed themes based on authors' keywords.

This study is motivated by previous literature showing that research on corporate governance under the influence of risk and uncertainty socio-economic conditions and in specific industries is a recurrent topic. Ayadi *et al.* (2019) study corporate governance mechanisms and the financial crisis. Furthermore, Abdoush *et al.* (2022) approach the corporate governance topic, both in financial crisis and non-crisis times. Moreover, the academic environment is focused on corporate governance in the context of pandemic crisis. Hoang *et al.* (2022) find that the negative effects of the pandemic crisis are reduced in startups if companies have large boards of directors and the condition related to CEO duality is fulfilled. Some industries are considered sensitive due to the hurdles they face in social and economic imbalances. Guillet and Mattila (2010) examine corporate governance practices in the Hospitality industry, while Clark *et al.* (2021) study the influences exerted by pandemic crisis on companies in this industry. Other researchers focus on sensitive industries and crisis conditions through study of corporate social responsibility (CSR), or environmental and social dimensions (ESG), as integrated pieces of corporate governance. Benavides-Velasco *et al.* (2014) study the Hotel industry, and the main findings highlight that the level of corporate social responsibility implementation positively influences performance related to clients, employees, and society. Iyer and Jarvis (2019) provide a research review of CSR in the Hospitality industry, while Kuzey *et al.* (2021) explore the correlation between CSR and performance in Healthcare, Financial and Tourism business fields. Ding *et al.* (2021) explore the correlation between stock returns and corporate characteristics in the context of COVID-19 and find that corporate social responsibility activities carried out before the pandemic crisis exert a positive influence on stock prices.

Also, the motivation is attributed to specific scientific methods used in prior literature and considered relevant in examining the research trend. For example, Xu *et al.* (2021) performs a bibliometric analysis on crisis literature and entrepreneurship, while Lagasio and Cucari (2019) use meta-analytical review as the main research method in studying corporate governance, complemented with social and environmental disclosure.

The results are considered in the context of previous research and their impact is valued throughout the progress of the research, key characteristics, and academic collaboration. Contribution of research is ensured by the temporal framework (2008-2022) and by the specific business framework, represented through the analysis of sensitive industries. The comparative approach is facilitated based on crisis and non-crisis reference periods, and on various industries included in the same field. This may contribute to the identification of niches for future research, with important implications for scientific and business activities.

The rest of the paper is organized as follows. Section 2 covers an overview of the existing literature on corporate governance in sensitive industries and develops the research questions. Section 3 highlights the research methodology, describing data collection and data processing. The results are discussed in Section 4, while Section 5 concludes with a summary of the findings, limitations, and perspectives for future research.

2. Literature review

According to Rezaee (2004), corporate governance represents the main control and management mechanism for companies, which delineates the power sharing between corporate executives and investors, ensuring that they have strong business relationships. Corporate governance guarantees a precise setting of business objectives, ensuring that all resources are used efficiently to fulfill established purposes, permanent monitoring of activities, and quantify the performance obtained. The value creation process for stakeholders is based on a high-quality corporate governance system. Gachie and Govender (2017) support these statements, identifying a series of benefits of good corporate governance, of which management quality, market advantage, cost reduction, economic innovation, and sustainable development may be mentioned.

Corporate governance represents a field intensively debated in the literature, both from its evolution point of view and from the influences exerted in different business areas, with implications for financial and non-financial reporting. Solomon (2020) emphasizes corporate governance failures under the conditions of the credit crunch and the global financial crisis. The well-known financial scandals, such as Enron and Parmalat demonstrate the weaknesses of corporate governance, simultaneously highlighting the need for consolidated regulatory policies and practices codes.

Moreover, researchers are interested in corporate governance connected with the major changes in socio-economic context, related to environmental or social dimensions. For example, Srivastava (2015) studied corporate governance during the financial crisis, and the results demonstrate that characteristics such as CEO duality and ratio of inside directors significantly influence financial performance. Likewise, Villanueva-Villar *et al.* (2016) studied corporate governance correlated with value creation under economic crisis conditions and found that board size and board independence are the significant variables. Using a structured literature review, Koutoupis *et al.* (2021) highlighted that developed countries distinguish through research on corporate governance in the pandemic crisis period. Naeem *et al.* (2022) studied the COVID-19 period and found that gender diversity significantly influences the relationship between corporate governance attributes and corporate sustainable performance.

Research on sensitive industries, such as Oil and Gas Extraction, Energy, Transportation and Warehousing, Health Care and Social Assistance, Construction, or Manufacturing were widely addressed along the time, as consequences of pressures triggered by law and regulations (Montes-Sancho *et al.*, 2022). Moreover, Garcia *et al.* (2017) accentuates the idea that sensitive industries are constantly under social and political pressure. They consider that sensitive industries are represented by those which are prone to produce significant damages on environmental and social dimensions and have a higher risk of occurring. Recently, Chemical and Pharmaceutical fields are considered sensitive industries (Yang and Yulianto, 2022) especially in the context of pandemic crisis. In light of previous research, it may be considered that sensitive industries are both those that significantly influence the environment and those whose sensitivity is determined by crisis conditions.

Corporate governance in sensitive industries is a long-discussed topic in the literature. One of the industries that represents a challenge for researchers, given the vast set of norms that regulate corporate governance, is the Banking industry. Bhatia and Gulati (2021) pursue in their research the assessment of how board governance influences bank performance. Their results emphasize that bank performance is positively influenced by boards with gender diversity and a high ratio of outside and non-executive directors. Furthermore, Matuszak *et al.* (2019) studied the Banking industry from the perspective of corporate governance influences, and found that board characteristics, such as size, female leadership, or foreign members exerted a significant influence on CSR disclosure.

The Maritime industry, as an integrated component of Transportation industry, is of research interest for Andreou *et al.* (2014), which examined corporate governance correlated with financial decisions adopted by the management, and with firm performance. Retrospective analysis of the results reveals that firm performance may depend on corporate governance, through board size, CEO duality, and corporate governance committees. Milanesi *et al.* (2020) used systematic literature review to examine sustainable reporting in the Pharmaceutical industry, while the Energy industry is studied by Constantinescu *et al.* (2021), who focus on corporate governance as an integrated part of ESG factors.

Kuo *et al.* (2021) approached the topic of CSR, studying its influence on Airline industry companies. Their findings suggest that if ESG performance is considered one of the measures of CSR, this fact contributes to the positive influence exerted on short-term key performance indicators. These short-term influences may provide long-term perspectives for management.

Corporate governance as an integrated part of corporate social responsibility was studied by Uyar *et al.* (2020) for the Hospitality and Tourism industry, aiming at identifying the characteristics that companies should pay more attention to. They found that CSR committees influence stakeholders' goals and demand. In addition, an independent Board of Directors ensures the quality of corporate governance and CSR commitments when they care about strengthening the governance structure, meeting shareholders' interests, and generating long-term value. Furthermore, participation in CSR activities is directly proportional to the ratio of women on the Board.

In the regard of exploring the fifteen-year evidence of research on corporate governance in sensitive industries, four research questions are formulated. In order to ensure an in-depth understanding, the first and the third research questions were extended with sub-questions:

RQ1. *How has the research on corporate governance in sensitive industries developed during the last 15 years*?

> **RQ1.1.** *Are the dynamics of research in crisis periods versus non-crisis periods different?*

RQ2. *Which are the most prominent sensitive industries explored in prior research?*

RQ3. *Which are the characteristics of research on corporate governance in sensitive industries?*

> **RQ3.1.** *Are papers published in journals, better documented as compared to other publication types?*
>
> **RQ3.2.** *Are papers published in journals, more cited as compared to other publication types?*
>
> **RQ3.3.** *Are papers published in book chapters and in journals, more extensive as compared to conference proceedings?*

RQ4. *How the research on corporate governance in sensitive industries may be characterized in term of co-authorship, co-affiliation, and co-occurrence of keywords?*

3. Methodology

This research provides a review of scientific papers published during the last fifteen-year aiming at analyzing the evolution of research on corporate governance in sensitive industries. The literature review covers the theoretical framework of the research field, based on relevant papers that studied this area. The bibliometric analysis, combined with an in-depth descriptive and statistical analysis are performed to explore research dynamics, defining characteristics, and scientific cooperation. The empirical character of this study is ensured by statistical indicators and independence t-tests, completed with descriptive and network analysis. Frequency analysis examined the evolution of publishing, with type, year, and business fields information included.

The source of the data collection, as well as the steps taken in conducting this bibliometric analysis were designed according to Baker *et al.* (2020), Cumming *et al.* (2023), and Khan (2022) research. Hence, four main steps may be counted. First, depending on the research topic, the database is set up. Second, data is collected and processed. Third, the appropriate techniques for database analysis are selected. Muchmore, the authors included science mapping in bibliometric techniques, to highlight the academic interest in specific research areas. The science mapping created through network visualization reveals structural connections and relevant interactions between universities and authors, which is essential for the summary of results and the future research horizon.

For this study, the source for secondary data collection is the Web of Science Core Collection Database, which is provided by Clarivate Analytics. Data are collected for the period between 2008 and 2022, the search strategy being based on keywords *corporate governance* and *sensitive industries,* and on *corporate governance* combined with each industry considered sensitive (*Airline*, *Banking*, *Energy*, *Healthcare*, *Hospitality*, *Logistic*, *Pharmaceutical*, *Tourism*, and *Transportation*). The first filtered is represented by period and specific searching keywords. According to Khan *et al.*

(2022) and Xu *et al.* (2021), in the Web of Science, highly relevant scientific publications are included, this database providing bibliographic valuable information such as publication type, volume, year, number of pages, and journal issue number. The reason for the research reference time frame (2008-2022) consists in detecting the global financial and pandemic crisis influences exerted on scientific research activity.

Initially, the sample consisted of 1,827 studies, but the database was processed using *Microsoft Excel* software, by selecting specific Web of Science research areas (*Business, Economics,* and *Management*), and exclusion of studies with essential missing data. The total number of excluded studies is 901, of which 3 papers have no author information, 76 have no publication year, 230 are duplicates, 488 of them are not included in defined research areas, 24 have no abstract information, and 80 have missing data on authors' keywords. Finally, the sample is reduced to 926 studies. The information is than collected for a list of variables chosen to characterize the publications: name of the authors, affiliation, title of the paper, abstract, keywords, publication type, publication year, cited reference count, times cited, and number of pages. The statistical tests and the main statistical indicators are performed using *SPSS Statistics Version 23*, while network visualization for co-authorship, co-affiliation, and co-occurrence of keywords is based on using *VOS viewer* software.

4. Results

4.1. The dynamics of corporate governance in sensitive industries research

The first research question (*RQ1. How has the research on corporate governance in sensitive industries developed during the last 15 years*?) draws on examining the trend of research, considering information about three publication types (*Table 1*) and fifteen years (*Table 2*). Scientific journals stand out as the most significant publication type, with the highest number of papers published (824 papers, 89%), followed by conference proceedings (84 papers, 9.1%), and then by book chapter type, for which only 18 papers are found (1.9%).

Table 1. **Publication type frequency analysis**

Publication Type	**Frequency**	**Percent (%)**
Book Chapter	18	1.9
Conference	84	9.1
Journal	824	89.0
Total	*926*	*100.0*

The trend of research on corporate governance in sensitive industries is determined based on the absolute and relative number of publications per year, from 2008 to 2022 (*Table 2, Panel A*). The trend is interpreted as comprehensive, and it could be considered that the general trend is upward, except for the decrease in 2010, when the total number of publications is reduced with 11 studies compared to 2009. Likewise, it is noticed that the number of studies published in 2016 is lower than the number of those published in 2015, the difference being given by two studies. Furthermore, the analysis emphasizes that 20 fewer studies were published in 2019, compared to 2018. An important upward trend is observed for the period between 2020 and 2022, for each year, the number of studies published being higher than in the previous. From this point of view, 2022 represents a referenced year, highlighting 141 (15.2%) published papers.

Table 2. **Publication year frequency analysis**

Year/Period	Frequency	Percent (%)	Business Field Focus
Panel A. Publications per year			
2008	18	1.9	Banking, Energy, Pharmaceutical
2009	24	2.6	Banking, Energy, Tourism
2010	13	1.4	Banking, Pharmaceutical
2011	21	2.3	Banking, Logistic
2012	26	2.8	Banking, Hospitality
2013	34	3.7	Banking, Energy, Pharmaceutical
2014	35	3.8	Banking, Energy, Logistic, Transportation, Tourism
2015	48	5.2	Banking, Energy, Pharmaceutical, Tourism
2016	46	5.0	Airline, Banking, Energy, Hospitality, Logistic, Tourism
2017	86	9.3	Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism
2018	111	12.0	Airline, Banking. Energy, Logistic, Pharmaceutical, Tourism, Transportation
2019	91	9.8	Airline, Banking, Energy, Hospitality, Logistic, Tourism
2020	112	12.1	Airline, Banking, Energy, Healthcare, Hospitality, Logistic, Pharmaceutical, Tourism
2021	120	13.0	Airline, Banking, Energy, Hospitality, Pharmaceutical, Logistic, Tourism
2022	141	15.2	Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism, Transportation
Total	*926*	*100.0*	
Average per year	*62*	*6.7*	
Panel B. Publications per crisis/non-crisis periods			
2008-2009 crisis period			Banking, Energy, Pharmaceutical,
Total articles	42	4.5	Tourism
Average per year	21	2.25	
2010-2019 non-crisis			Airline, Banking, Energy,
period	511	55.2	Hospitality, Logistic,
Total articles	51	5.52	Pharmaceutical, Tourism,
Average per year			Transportation
2020-2022 crisis period			Airline, Banking, Energy,
Total articles	373	40.3	Healthcare, Hospitality, Logistic,
Average per year	124	13.4	Pharmaceutical, Tourism, Transportation

The results presented in *Table 2, Panel B* allow for an approach analysis of the reference period and address the research sub-question *RQ1.1. Are the dynamics of research in crisis periods versus non-crisis periods different?* The purpose of this supplementary question is to delimit the time frame into three periods, the response aiming at identifying eventually influences exerted by crisis conditions (financial and pandemic), compared to non-crisis periods.

The period between 2008 and 2009 faced many difficulties generated by the global financial crisis which started at the end of 2007. In this period, publishing interest is increasing, with the total number of studies being 42, representing 4.5% of the sample. These values may be attributed to the research attention paid to corporate governance by researchers, especially in fields strongly affected by the financial crisis. Based on the business field focus included in Table 2, it may be concluded that researchers were concentrated on *Banking, Energy, Pharmaceutical*, and *Tourism* industries. To argue these assumptions, a study performed by Erkens *et al.* (2011) on corporate governance in companies that carried out activities in the financial field, taking into consideration 2007-2008 crisis conditions, may be mentioned. Their results emphasize the important impact of corporate governance on financial performance during the crisis, from the point of view of risk taking and financing policies. Furthermore, Gupta *et al.* (2013) approached the corporate governance topic under global financial crisis conditions in non-financial companies, and their findings suggest that the efficiency of capital markets decreased under crisis circumstances.

The time frame between 2010 and 2019 could be considered a non-crisis period. At the end of 2019, the moment of onset of the pandemic crisis, its extent created confusion and its repercussions could not be monitored. Instability at the academic level may be observed in the decrease of the number of studies published in 2019 compared to 2018. Researchers maintain their increasing interest in publishing on corporate governance in sensitive industries, with an average of 51 papers per year. However, the area of interest is extended, and the industries for which the research interest prevail are represented by *Airline, Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism,* and *Transportation*. Moreover, even if the 2010-2019 could be considered a non-crisis one, researchers continued observing the effects of the global financial crisis.

For the period between 2020 and 2022, the academic field faced a new socio-economic context, determined by pandemic phenomenon, and its worldwide disastrous consequences. Starting from these conditions, researchers approached the topic and studied cause-effect relationships in detail, correlated with corporate governance in sensitive industries. These arguments explain the upward publication trend for the period 2020-2022. For example, Qui *et al.* (2021) conducted research on the influence exerted by corporate social responsibility activities on stock returns in companies that carried out hospitality industry activities. The authors examined the reaction of stakeholders to the evolution of the stock market. Their results emphasize that investors have favorable reactions to the corporate social responsibility activities in pandemic crisis conditions, because these activities have the role of protecting employees, clients, or suppliers. The results presented in *Table 2* allow for a summary of studies published between 2020 and 2022, measured absolute and relative. The average number of studies (127 papers) is significantly higher, compared with previous periods. The total papers published represent 40% of the sample, and focus on *Airline, Banking, Energy, Hospitality, Logistic, Pharmaceutical, Tourism, Transportation* business fields.

To further analyze the data, starting from the results obtained for RQ1, this study approaches the second research question (*RQ2. Which are the most prominent sensitive industries explored in prior research?*), which aims at identifying the number of published studies, according to the search topic used. The *corporate governance* keyword is combined, at a time, with keywords referring to *sensitive industries* in general, and the transition to specific business fields is completed by including keywords for each industry in the search topic. The sample includes both industries considered sensitive by definition (*Airline*, *Banking*, or *Energy*) and industries considered sensitive based on the fact that they are significantly influenced by global financial or pandemic crisis conditions (*Hospitality, Logistic*, *Pharmaceutical, Tourism, Transportation*).

Table 3. **Search topic frequency analysis**

Search Topic	Frequency	Percent (%)
Corporate governance & Airline industry	18	1.9
Corporate governance & Banking industry	536	57.9
Corporate governance & Energy industry	109	11.8
Corporate governance & Healthcare industry	7	0.8
Corporate governance & Hospitality industry	49	5.3
Corporate governance & Logistic industry	49	5.3
Corporate governance & Pharmaceutical industry	27	2.9
Corporate governance & Sensitive industries	68	7.3
Corporate governance & Tourism industry	47	5.1
Corporate governance & Transportation industry	16	1.7
Total	**926**	**100.0**

Table 3 shows the results for the search topic frequency analysis. More than half of the studies included in the sample (536 publications, 57.9%), taking into consideration aspects of corporate governance in sensitive industries, are represented by research on the Banking industry. According to the literature (Kara *et al.*, 2022; Citterio and King, 2023), the Banking industry is a long-researched topic because the effects of crises, be it financial or pandemic, have been negative and difficult to predict in this field. Moreover, interest for research on the Energy industry and corporate governance is increased, this search topic being ranked second, with 109 studies (11.8%). Guérin and Suntheim (2021) studied this topic and approached the environmental performance of economic entities in the context of the COVID-19 crisis. Furthermore, Stocker *et al.* (2020) studied sustainability issues.

Analyzing the search topic based on *corporate governance* and *sensitive industries* in general, 68 studies (7.3%) were returned. The next areas approached by researchers are *Hospitality industry* and *Logistic industry*, with 49 studies each (5.3%) and *Tourism industry*, with 47 papers (5.1%). For the *Pharmaceutical*, *Airline, Transportation*, and *Healthcare* industries, fewest studies are published (between 7 and 27 studies along the entire period).

4.2. Characteristics of corporate governance in sensitive industries research

To respond the third research question (*RQ3. Which are the characteristics of research on corporate governance in sensitive industries?*), a descriptive analysis detailed by publication type is approached, starting to studies conducted by Donthu *et al.* (2021), and Baker *et al.* (2022), which performed bibliometric analysis. Based on data collected from the Web of Science database, three sub-questions are addressed:

RQ3.1. *Are papers published in journals, better documented as compared to other publication types?*

RQ3.2. *Are papers published in journals, more cited as compared to other publication types?*

RQ3.3. *Are papers published in book chapters and in journals, more extensive as compared to conference proceedings?*

In-depth statistical analysis is performed by calculating the main statistical indicators (minimum, maximum, mean, and standard deviation), similar to Baker *et al.* (2022), extended next with the one-way ANOVA tests. The results are summarized in *Table 4* and confirm the research findings, showing that there is a significant difference among the three types of publications. The identified characteristics refer to the total number of bibliographic references, the number of times a paper is cited in *Web of Science Core Collection* and in *All databases*, and last, but not least, examined characteristics present information about the total number of pages.

Table 4. **Descriptive statistics and independence t-tests for papers' characteristics, grouped by publication categories**

Papers' characteristics	Publication Type	Valid N (listwise)	Min.	Max.	Mean	Std. Deviation	One-way ANOVA
Cited reference count	Book Chapter	18	16	129	62.83	33.888	63.35**
	Conference	84	3	119	29.15	22.381	
	Journal	824	6	297	70.62	32.990	
Times cited (WOS Core Collection)	Book Chapter	18	0	39	6.39	10.071	10.05**
	Conference	84	0	19	1.37	3.211	
	Journal	824	0	448	19.55	39.135	
Times cited (All databases)	Book Chapter	18	0	39	6.39	10.071	10.00**
	Conference	84	0	20	1.43	3.338	
	Journal	824	0	460	19.95	40.036	
Number of pages	Book Chapter	18	17	48	28.17	9.488	76.22**
	Conference	84	4	35	10.19	5.150	
	Journal	824	4	56	19.89	7.690	

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

The total number of studies cited by the authors in their research is highlighted through the *Cited reference count*. The minimum limit varies between 3 and 16. The lowest number of references is attributed to conference papers. The maximum limit ranges between 119 and 297; most references are cited in scientific journals. Studies published in books are in the second position, with maximum references of 129. On average, book chapters and articles in journals are quite similar, with means of 62.83, and 70.62, respectively. For conference papers the mean is of 29.15, less than half compared to books chapters and journals. The differences identified by descriptive statistics are further supported by the one-way ANOVA results. These findings validate the purpose of the investigation and respond adequately to *RQ3.1.*, demonstrating a better documentation of studies published in scientific journals and books.

The times cited, on the Web of Science Core Collection and in All databases, measure the number of times publications are cited. Characteristics may be considered relevant because they allow for comparability. For the times cited, the minimum number is 0 and the maximum varies between 39 and 460, depending on the publication type. The most cited papers are articles published in leading journals, and the book chapter type of publication is second in the ranking. The publication type with the smallest number of times cited is represented by the conference proceedings. The differences identified for the number of citations are further supported by the one-way ANOVA results. These results represent a response to *RQ3.2.* and an argument for scientific validation of leading journals.

For the characteristic regarding *the number of pages* descriptive statistics results reveal a minimum number of pages (between 4 and 17), that for the three types of publications, while the maximum number ranges between 35 and 56. The highest number of pages are identified for papers published in journals (56 pages), followed by book chapter type, with 48 pages, and by conference papers, with 35 pages. However, on average, the studies published in book chapters are the most extensive, with 28.17 pages, followed by articles published in journals (19.89 pages) and in conference proceedings (10.19 pages). Overall, the differences identified for the number of pages are further supported by the one-way ANOVA results. These findings confirm the extensive content of studies published in books chapters and in journals, as a response to *RQ3.3*.

4.3. Network analysis of corporate governance in sensitive industries research

Network analysis of research on corporate governance in sensitive industries is performed using *VOS viewer software*. It examines aspects such as scientific collaboration between authors, together with identifying universities with high influence, and the most covered topics among scholars. This section aims to respond to *RQ4. How the research on corporate governance in sensitive industries may be characterized in term of co-authorship, co-affiliation, and co-occurrence of keywords?*

To examine the authors' collaboration on corporate governance in sensitive industries, a network analysis of *co-authorship* is performed. Network visualization enables to observe the nodes sizes of the authors, which suggest their links established with other researchers, from a scientific collaboration point of view. Results are displayed in *Figure 1* and *Table 5*.

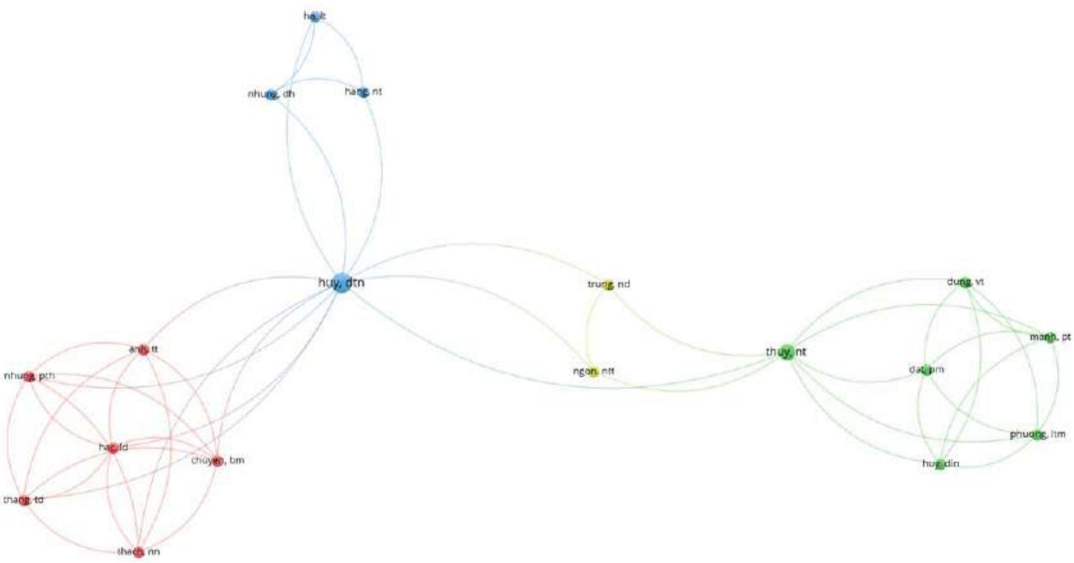

Figure 1. **Co-authorship analysis grouped by studies published**

For the studies included in the network analysis, the criteria regarding authors and documents per author are set in *VOS viewer*. The maximum number of authors for an article is set at 25, and another condition is that the authors have at least one paper published. The analysis implies the fact that the generated clusters are comprised of authors with the most relevant collaborations between them or with others. *Figure 1* shows clusters generated by the software, presented in relevance order, each of them highlighted with a color. For the first cluster, the attributed color is red, and it contains 6 authors. The second cluster is marked with green and is composed of 6 authors. The three authors included in the third cluster are marked with blue, and the last cluster, highlighted with yellow, is composed only of two authors.

Given that the sample size is relatively small, only four clusters are generated. In *Table 5* are displayed the authors included in each cluster.

Starting with the network visualization results, an approach descriptive analysis is performed for each cluster, highlighting the authors about which a high degree of collaboration is noted. They are presented in relevance order, and the total number of authors for each group varies between 2 and 6.

Table 5. **Collaboration between authors - Main clusters**

Main clusters (Colors)	**Cluster 1 (Red)**	**Cluster 2 (Green)**	**Cluster 3 (Blue)**	**Cluster 4 (Yellow)**
Authors	Anh, T.T.	Dat, P.M.	Ha, L.T.	Ngon, N.T.T.
	Chuyen, B.M.	Dung, V.T.	Hang, N.T.	Trung, N.D.
	Hac, L.D.	Huy, D.T.N.	Huy, D.T.N.	
	Nhung, P.T. H.	Manh, P.T.	Nhung, D.H.	
	Thach, N.N.	Phuong, L.T.M.		
	Thang, T.D.	Thui, N.T.		

According to the database, authors of generated clusters make scientific contributions to the Banking field, correlated with risk management and sustainability. Furthermore, the authors approach the topic of corporate governance standards after the financial crisis. Other topics in which they develop research are correlated with agency problem in the Banking industry.

The collaboration between authors is also analyzed by grouping co-authorship by universities in which authors are affiliated (*co-affiliation*). Ten clusters are generated, and, in the network visualization, they are represented in the order of relevance. The maximum number of universities could be 25 and the minimum number of papers for each university should be 5. For each returned cluster, the number of universities varies between 3 and 10.

The results are shown in *Figure 2* and *Table 6*. The first cluster (red) contains 10 universities, while the second cluster (green) consists of 9 universities. The third cluster (blue) includes 8 universities, for the fourth cluster (yellow) the total number of universities being 7. The fifth cluster (purple) is composed of 6 universities, while the sixth cluster (turquoise) contains 4 universities. The seventh cluster (orange), the eighth cluster (brown) and the ninth cluster (pink) consist of 4 universities, each while for the tenth cluster (orange), the total number of items is 3.

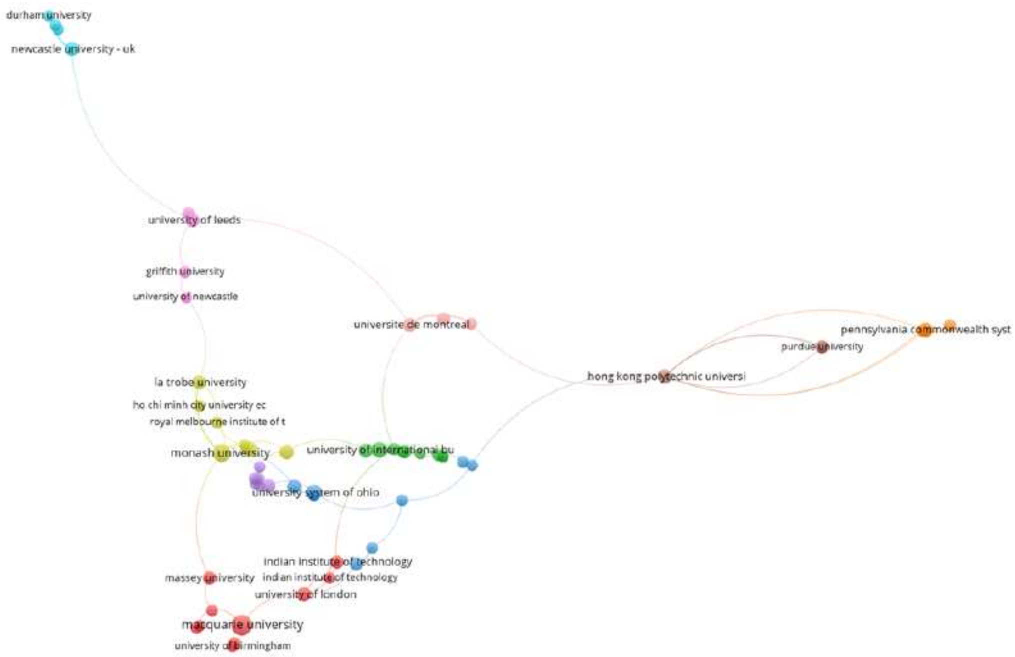

Figure 2. **Co-authorship analysis grouped by universities**

Next, to an expanded investigation, information about the first three clusters is presented in a detailed form, to identify the most relevant universities in research on corporate governance in sensitive industries. *Table 6* displayed universities grouped in the first three clusters, according to their relevance order. Among the most common regions that appear in the clusters are counted European and non-European areas. Among the regions, China, United Kingdom, United States, Norway, Switzerland, Zurich, India, or Italy could be mentioned. For example, in the third cluster, the universities from the United Kingdom prevail. These results suggest an evolution of collaboration between authors and universities. The analysis indicates an increased interest in developing the topic of corporate governance in sensitive industries, approaching fields like Banking, Hospitality, Pharmaceuticals, Tourism, or Transportation.

Table 6. **Authors collaboration grouped by universities**

Main clusters (Colors)	**Cluster 1 (Red)**	**Cluster 2 (Green)**	**Cluster 3 (Blue)**
Universities	Indian Institute of Technology Macquarie University Massey University Sapienza University Rome University of Agder University of Birmingham University of London Xi’an Jiaotong University Zhongnan University of Economics & Law	Bocconi University City University of Hong Kong Erasmus University Rotterdam Korea University New York University Renmin University of China University of International Business & Economics University of St. Gallen University of Zurich	Lancaster University National Cheng Kung University University of Bath University of Manchester University of Portsmouth University System of Maryland University System of Ohio

Main clusters (Colors)	Cluster 1 (Red)	Cluster 2 (Green)	Cluster 3 (Blue)
Countries	Australia, China, India, Italy, New Zeeland, Norway, Switzerland, Taiwan, The United Kingdom, The United States of America		

Keywords may be considered the essence of a study. *Figure 3* presents the results of *co-occurrence of keywords* analysis in the field of corporate governance in sensitive industries research. A total number of 113 unique keywords were identified in the 926 papers included in the analysis. For this network analysis, the condition is that a keyword appears at least 5 times, and the clusters identified by different colors in *Figure 3* are presented in relevance order.

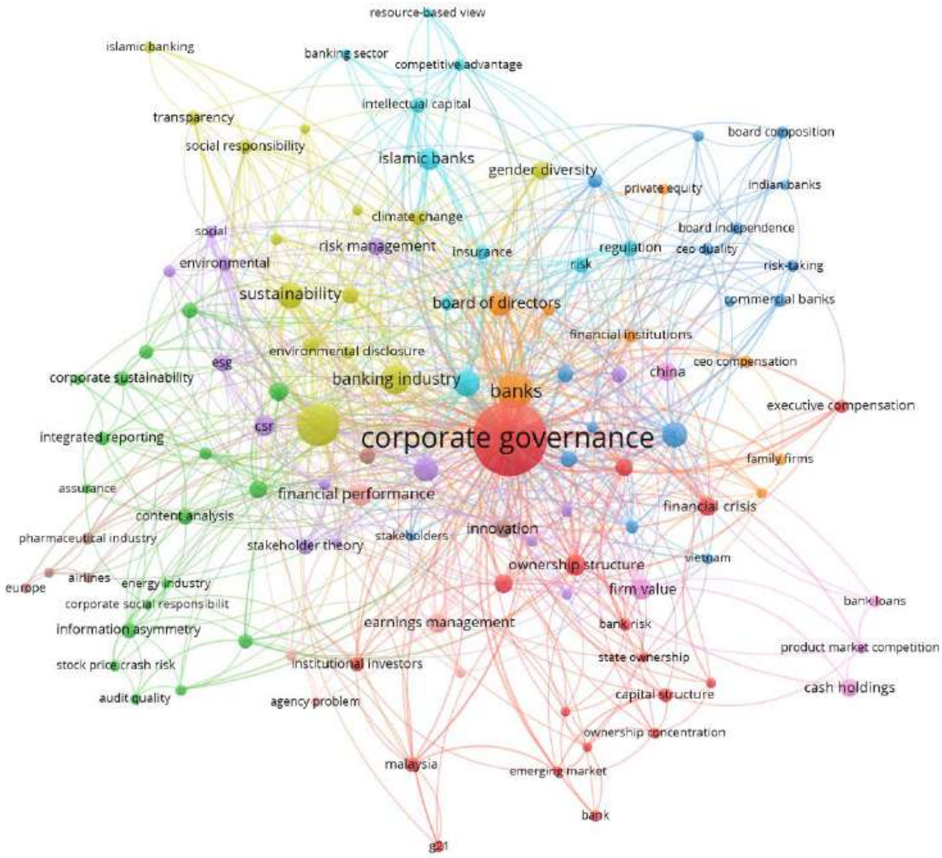

Figure 3. **Keywords co-occurrence analysis**

It may be noticed that the most frequent keyword is *corporate governance* that co-occur with characteristics referring to the board of directors (size, independence, duality, structure, diversity, gender diversity, CEO compensation), and ownership (ownership concentration and structure, international investors, government or state ownership, small and medium enterprises, and capital structure). Likewise, the most encountered business field-specific keywords are those relating to *banking* (financial) sector (banks, insurance, commercial banks, financial institutions, bank loans, cash holdings), but there are also frequently noticed keywords about specific industries (Pharmaceutical, Airline, Hotels). Additionally, the *sustainability* keyword emerges with a lower intensity, but with links to multiple related terms (environment, energy industry, social, climate change, environmental performance and disclosures, sustainability reporting, integrated reporting, sustainable development). Last but not least, the *financial and* *audit* related keywords may be observed as co-occurring (efficiency, profitability, financial performance, earnings management, ethics, assurance, audit quality).

5. Conclusion, limitations, and future research horizon

This study provides a fifteen-year evidence overview of research on corporate governance in sensitive industries. The evolution is examined for the period 2008-2022, the relevance being ensured by the time frame, that includes both crisis and non-crisis periods, and by the specifics of the business fields. Bibliometric analysis combined with statistical, descriptive, and network analysis provides appropriate answers to the four research questions addressed in the Literature review section. In the context of previous studies, the results are validated, their accuracy consisted in setting up the evolution of research, based on research trend, and the industries scholars focused on.

The analysis according to the year and type of publication suggests that scientific journals stand out by the largest number of studies published. Muchmore, by delineating the time frame in crisis and non-crisis periods, and by examining the publications according to the business field focus, it may be noticed that, in financial crisis, researchers mainly focused on Banking and Energy industries, while in pandemic period, industries list is extended, with fields as Airline, Pharmaceutical, Logistic, Transportation, or Hospitality. The relevance of research on corporate governance in sensitive industries, based on descriptive analysis and statistical tests, aims to identify the characteristics of research, completed with highlight the better documented, more cited, and more extensive publications. Findings indicate the studies published in scientific journals in the top of the ranking, while in the second position there are the book chapters. Furthermore, the specifics of the studies included in the database are analyzed in a different manner, based on co-authorship and co-affiliation, completed with cooccurrence of keywords. Results suggest that a high state of collaboration between authors from different countries and universities determines an increased degree of research validation, and dissemination of results, that may be supported by the multicultural approach, considering different financial and non-financial standards applied by companies (Montes-Sancho *et al.*, 2022), state laws and regulations (Garcia *et al.*, 2017), and the different influences exerted by global financial, pandemic, or war crises (Naeem *et al.*, 2022), in a specific business field represented by sensitive industries. The co-occurrence of keywords analysis, which may represent a basis for future research horizon, highlights that the most frequent keywords are representative for corporate governance characteristics (board, ownership, corporate social responsibility etc.), and the most business field-specific keywords are to Banking (financial) sector. This remark may be attributed to the fact that most of the papers included in this research dataset approach the banking topic.

The contribution of this study may be seen three-fold, for the field of research on corporate governance in sensitive industries. First, the output of performance analysis allows to create an overview of the interest granted by academic environment to corporate governance in the particular topic of sensitive industries. Second, the results validation is supported by comparison between crisis and non-crisis periods, together with identifying the most prominent studies. Third, the contribution is complemented by relevant interactions and structural connections, provided through science mapping of authors and universities collaboration, simultaneously with the prominent research areas based on co-occurrence of keywords.

The limitations of this research may reside in the lack of a meta-analysis, which includes the study of the methodological specifics, research methods, and the main findings, ensuring a holistic representation of future research directions. These limitations may also be attributed to the number of studies. Therefore, future studies may address an in-depth analysis for a relevant sample of the dataset, but also an extended quantitative approach based on econometric modelling. Muchmore, scholars may extend the research on other industries considered sensitive or on another time frame, to compare the results with the existing ones.

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References

Abdoush, T., Hussainey, K. & Albitar, K. (2022) „Corporate governance and performance in the UK insurance industry pre, during and post the global financial crisis", *International Journal of Accounting & Information Management*, vol. 30, no. 5: 617-640

Almashhadani, H.A. & Almashhadani, M. (2022) „Corporation Performance and Corporate Governance System: An argument", *International Journal of Business and Management*, vol. 13, no. 2: 13-18

Andreou, P.C., Louca, C. & Panayides, P.M. (2014) „Corporate governance, financial management decisions and firm performance: Evidence from the maritime industry", *Transportation Research Part E*, vol. 63: 59-78

Ayadi, M.A., Ayadi, N. & Trabelsi, S. (2019) „Corporate governance, European bank performance and the financial crisis", *Managerial Auditing Journal*, vol. 34, no. 3: 338-371

Baker, H.C., Pandey, N. & Haldar, A. (2020) „A bibliometric analysis of board diversity: Current status, development, and future research perspectives", *Journal of Business Research*, vol. 108: 232-246

Baker, H.C., Kumar, S., Goyal, K. & Gupta, P. (2022) „International journal of finance and economics: A bibliometric overview", *International Journal of Finance and Economics*, vol. 28, no. 1: 9-46

Bhatia, M. & Gulati, R. (2021) „Board governance and bank performance: A meta- analysis", *Research in International Business and Finance*, vol 58: 1-30

Benavides-Velasco, C.A., Quintana-García, C. & Marchante-Lara, M. (2014) „Total quality management, corporate social responsibility and performance in the hotel industry", *International Journal of Hospitality Management*, vol. 41: 77-87

Caraiani, C., Lungu, C.I., Bratu, A. & Dascălu, C. (2018) „Exploring the perspectives of integrated reporting for future research opportunities", *Journal of Accounting and Management Information Systems*, vol. 17, no. 4: 532-565

Citterio, A. & King, T. (2023) „The role of Environmental, Social, and Governance (ESG) in predicting bank financial distress", *Finance Research Letters*, vol. 51: 1-7

Clark, J., Mauck, N. & Pruitt, S.W. (2021) „The financial impact of COVID-19: Evidence from an event study of global hospitality firms", *Research in International Business and Finance*, vol. 58: 1-13

Constantinescu, D., Caraiani, C., Lungu, C.I. & Mititean, P. (2021) „Environmental, social and governance disclosure associated with the firm value. Evidence from energy industry", *Journal of Accounting and Management Information Systems*, vol. 20, no. 1: 56-75

Cumming, D., Jindal, V., Kumar, S. & Pandey, N. (2023) „Mergers and acquisitions research in finance and accounting: Past, present, and future”, *European Financial Management*, vol. 29, no. 2: 1-41

Ding, W., Levine, R., Lin, C. & Xie, W. (2021) „Corporate immunity to the COVID-19 pandemic”, *Journal of Financial Economics*, vol. 141, no. 2: 802-830

Donthu, N., Kumar, S., Pandey, N. & Gupta, P. (2021) „Forty years of the International Journal of Information Management: A bibliometric analysis”, *International Journal of Information Management*, vol. 57: 1-22

Erkens, D.H., Hung, M. & Matos, P. (2011) „Corporate governance in the 2007–2008 financial crisis: Evidence from financial institutions worldwide”, *Journal of Corporate Finance*, vol. 18, no. 2: 389-411

Gachie, W. & Govender, D.W. (2017) „Practical Application of Corporate Governance Principles in a Developing Country: A Case Study”, *Risk governance & control: financial market & institutions*, vol. 7, no. 2: 67-75

Garcia, A.S., Mendes-Da-Silva, W. & Orsato, R.J. (2017) „Sensitive industries produce better ESG performance: Evidence from emerging markets”, *Journal of Cleaner Production*, vol. 150: 133-147

Guillet, B.D. & Mattila, A.S. (2010) „A descriptive examination of corporate governance in the hospitality industry”, *International Journal of Hospitality Management*, vol. 29, no. 4: 677-684

Guérin, P. & Suntheim, F. (2021) „Firms’ environmental performance and the COVID-19 crisis”, *Economic Letters*, vol. 205: 1-6

Gupta, K., Krishnamurtib, C. & Tourani-Rad, A. (2013) „Is corporate governance relevant during the financial crisis?”, *Journal of International Financial Markets Institutions & Money*, vol. 23: 85-110

Hoang H.V., Nguyen, C. & Nguyen, D.K. (2022) „Corporate immunity, national culture and stock returns: Startups amid the COVID-19 pandemic”, *International Review of Financial Analysis*, vol. 79: 1-14

Iyer, G.R. & Jarvis, L. (2019) „CSR adoption in the multinational hospitality context. A review of representative research and avenues for future research”, *International Journal of Contemporary Hospitality Management*, vol. 31, no. 6: 2376-2393

Kara, A., Nanteza, A., Ozkan, A. & Yildiz, Y. (2022) „Board gender diversity and responsible banking during the COVID-19 pandemic”, *Journal of Corporate Finance*, vol. 74: 1-27

Khan, A., Goodell, J.W., Hassan, M.K. & Paltrinieri, A. (2022) „ A bibliometric review of finance bibliometric papers”, *Finance Research Letters*, vol. 47, Part. A: 1-9

Khan, M.A. (2022) „ESG disclosure and Firm performance: A bibliometric and meta analysis”, *Research in International Business and Finance*, vol. 61: 1-9

Koutoupis, A., Kyriakogkonas, P., Pazarskis, M. & Davidopoulos, L. (2021) „Corporate governance and COVID-19: a literature review”, *Corporate Governance International Journal of Business in Society*, vol. 21, no. 6: 969-982

Kuo, T.C., Chen, H.M. & Meng, H.M. (2021) „Do corporate social responsibility practices improve financial performance? A case study of airline companies”, *Journal of Cleaner Production*, vol. 310: 1-13

Kuzey, C., Uyar, A., Nizaeva, M. & Karaman, A.S. (2021) „CSR performance and firm performance in the tourism, healthcare, and financial sectors: Do metrics and CSR committees matter?”, *Journal of Cleaner Production*, vol. 319: 1-14

Lagasio, V. & Cucari, N. (2019) „Corporate governance and environmental social governance disclosure: A meta-analytical review”, *Corporate Social Responsibility and Environmental Management*, vol. 26, no. 4: 701-711

Lungu, C.I., Mititean, P., Caraiani, C. & Constantinescu, D. (2020) „A structured literature review of corporate governance and performance research within an emerging country setting”, *Journal of Accounting and Management Information Systems*, vol. 19, no. 4: 707-733

Matuszak, L., Różańska, E. & Macuda, M. (2019) „The impact of corporate governance characteristics on banks' corporate social responsibility disclosure: Evidence from Poland", *Journal of Accounting in Emerging Economies,* vol. 9, no. 1: 75-102

Milanesi, M., Runfola, A., Guercini, S. (2020) „Pharmaceutical industry riding the wave of sustainability: Review and opportunities for future research", *Journal of Cleaner Production,* vol. 261: 1-12

Montes-Sancho, M.J., Tachizawa, E.M. & Blome, C. (2022) „Financial and market impacts of buyer-supplier sustainability asymmetries: Empirical evidence from sensitive industries", *Journal of Cleaner Production*, vol. 370: 1-12

Naeem, M.A., Karim, S., Nor, S.M. & Ismail, R. (2022) „Sustainable corporate governance and gender diversity on corporate boards: evidence from COVID-19", *Economic Research-Ekonomska Istraživanja,* vol. 35, no. 1: 5824-5842

Qui (Charles), S., Jiang, J., Liu, X., Chen, M.H. & Yuan, X. (2021) „Can corporate social responsibility protect firm value during the COVID-19 pandemic?", *International Journal of Hospitality Management,* vol. 93: 1-12

Rezaee, Z. (2004) „Corporate governance role in financial reporting", *Research in Accounting Regulation,* vol. 17: 107-149

Solomon, J. (2020) *Corporate Governance and Accountability*: John Wiley & Sons

Srivastava, N.K. (2015) „Does governance structure have any effect on firm performance during the financial crisis: Evidence from selected Indian companies", *Journal of Strategy and Management,* vol. 8, no. 4: 368-383

Stocker, F., de Arruda, M.P. & Mascena, K.M.C. (2020) „Stakeholder engagement in sustainability reporting: A classification model", *Corporate Social Responsibility and Environmental Management,* vol. 27: 2071-2080

Uyar A., Kilic, M., Koseoglu, M.A., Kuzey, C. & Karaman, A.S. (2020) „The link among board characteristics, corporate social responsibility performance, and financial performance: Evidence from the hospitality and tourism industry", *Tourism Management Perspectives,* vol. 35: 1-13

Villanueva-Villar, M., Rivo-Lopez, E. & Lago-Penas, S. (2016) „On the relationship between corporate governance and value creation in an economic crisis: Empirical evidence for the Spanish case", *BRQ Business Research Quarterly,* vol. 19, no. 4: 233-245

Wicaksono, R., Saputra, D. & Anam, H. (2019) „The Influences of Corporate Governance Mechanism towards Company's Financial Performance", *Audit Financiar,* vol. XVII, no. 3(155): 496-506

Xu, Z., Wang, X., Wang, X. & Skare, M. (2021) „A comprehensive bibliometric analysis of entrepreneurship and crisis literature published from 1984 to 2020", *Journal of Business Research,* vol. 135: 304-318

Yang, A. & Yulianto, F.A. (2022) „Cost of equity and corporate social responsibility for environmental sensitive industries: Evidence from international pharmaceutical and chemical firms", *Finance Research Letter,* vol. 47(Part A): 1-7

Zou, Z., Liu, X., Wang, M. & Yang, Z. (2023) „Insight into digital finance and fintech: A bibliometric and content analysis", *Technology in Society,* vol. 73: 1-19

Integrated Reporting – Means of Improving Stakeholder Communication Process

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Abstract: *This article studies in a systematic way, based on documentary research and theoretical inductions, the issue of integrated reporting, the general reporting framework and its role in the communication process with stakeholders. Integrated reporting promotes transparency in reporting and communicates to stakeholders, in a holistic way, information about how entities create value in the short, medium and long term. The paper uses, as a foundation, research based on the analysis of specialized literature, highlighting the benefits of integrated reporting in improving the communication process with stakeholders. Financial and non-financial elements reported by entities into a unified manner, addressing all users, is the element of innovation around which integrated reporting gravitates*.

Keywords: *Integrated reporting (IR), stakeholder theory, International Integrated Reporting Framework, interested parts communication, regulatory norms.*

1. Introduction

The general phenomena of globalization viewed as a megatrend of maximum magnitude is an engine of the digital economy, under the influence of the accentuated development of information technology, and all of these have a strong impact on information accounting systems. Economic entities have to face multiple challenges: global competition, technological progress, dynamics of national and international regulation, financial and governmental crises. In these conditions, the traditional financial reporting model no longer satisfies the informational needs of users (Flower, 2015). Traditional financial reporting involves the use of historical financial information and short-term information perspectives, without taking into account the complex non-financial phenomena that take place within entities (social, environmental, corporate governance) and the decision-making process is hampered (Reverte, 2015). This need for complete and rapid information leads to the expansion of traditional reporting by including various social and environmental aspects (Hapwood *et al.*, 2013; Mallin, 2013) and their increasing importance has determined many entities to report them voluntarily (Ligteringen, 2013).

Entities quickly adapted to the new reporting requirements, presenting their activity in clear and complete ways, while reporting to the informational increasingly requirements of interested parties. As this trend expanded, national or international regulations also appeared, accompanied by the companies' voluntary adoption of various international standards or guidelines. A new form of integrated reporting was developed, a one that redefines the activity of entities and the business environment and

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that ensures the connectivity of all financial and non-financial information in order to present them in the form of a single report addressed to all stakeholders.

The aim of this study is to treat the issue of integrated reporting with emphasis on creating communication with interested parties.

Piechocki (2007) identifies two factors underlying financial reporting. The first of these is represented of the large number of information users from financial reports and the second is represented by the legislative field characterized by a very strong dynamic. In the last twenty years, the rate of technology development has been exponential. If in the beginning, computer technology was used for the preparation of registers and financial reports, over time, computer technology became vital to the accounting system, developing into the central pawn of financial accounting reporting activity (Dechow *et al.*, 2007).

Intra- and inter-organizational financial data are the subject of daily activities and must correspond qualitatively and leave no room for interpretation by decision-makers. Standardization of reporting formats is one of the solutions needed to ensure the quality and interoperability of different sources data.

The motivation for choosing this research topic is based on the intention to contribute to the expansion of an innovative but, at the same time, extremely difficult research area, taking into account that integrated reporting is in full development process both at the research level and in the economic entities practice, accentuated by the requirements of integrated reporting standards implementation within the digital economy. At the same time, the contribution brought by the integrated report is seen in a double sense: on the one hand as a tool to value financial and non-financial information and on the other hand, it is a means that ensures the improvement of the communication process with the stakeholders. These two aspects are the motivation basis to study IR as a process in a dynamic and continuous development both at the level of specialized literature, the level of international regulation but also in economic practices. And, in order to have an integrated accounting system for financial reporting and effective performance control, it is absolutely necessary to develop an associated integrated IT system. At the same time, it is necessary to further study how local actors shape the limits in regulatory framework implementation to determine the process by which although accounting practices become global, retain national specificity (Albu *et al.*, 2022).

The relevance of the chosen theme results from the actuality of integrated reporting concept which is in full process of definition and development in scientific activity but also at the level of the regulatory framework. Although there has been an international framework developed by the International Integrated Reporting Council since 2013, revised in 2020, this reporting raises various problems in the economic entities practice. On the other hand, from the point of view of legal norms, the financial and non-financial reporting companies´ obligations continue to undergo major changes on all levels, being able to give as an example the norms issued by the European Parliament in the matter of sustainability reporting (European Parliament, 2022). Moreover, the activity in the financial field of the regulatory authorities themselves tend to exceed the limits of establishing legal norms (Albu *et al.*, 2022). With all these changes taking place on all levels (legislative, economic, social, environmental), more companies choose to voluntarily report integrated in accordance with international standards (KPMG, 2022).

The purpose of this paper is to define and to offer a critical analysis on the concept of integrated reporting and, implicit of the international integrated reporting framework and to establish these reports contribution in improving stakeholder communication process. In order to achieve this goal, we systematized and analyzed relevant works from the specialized literature and the international conceptual framework developed by International Integrated Reporting Council (IIRC) and we identified two objectives:

Objective no. 1 is to define and provide a critical analysis of integrated reporting (IR) concept, a presentation of integrated reporting evolution and perspectives through specialized literature, but also a presentation of the conceptual framework developed by the IIRC.

Objective no. 2 is to identify the contribution brought by integrated reporting in the development of the stakeholder communication process.

To accomplish these objectives, we studied the specialized literature from which it emerged that integrated reporting presents innovative business models that integrate economic, social, environmental and governance pillars, and present to stakeholders an entire unitary information system. This analysis of specialized literature related to integrated reporting resulted in the identification of different views on the researched subject and the association of these reports with various terms such as: integrated thinking, stakeholder theory, organizational management, corporate governance, sustainability reporting, accounting information systems integration solutions, directions for improving these systems. Finally, we focused our study towards the linkages between integrated reporting and stakeholder theory.

The methodology used to achieve the objectives consisted in the systematization and analysis of the most important articles from the specialized literature with the aim of synthesizing the results of previous research in this interest area.

We want for the present paper to be useful both for the business environment, for accounting professionals in order to understand the need to provide integrated reporting in accordance with international standards, but also as a starting point for future research.

The research results showed that financial reporting is currently guided by regulatory frameworks, social performance and the use of reporting standards. However, in order to increase their quality, it is essential that informational accounting systems integrate the principles of integrated electronic reporting, so that this aspect becomes a phenomenon that occurs naturally within the economic processes of companies and not just as a concept imposed by the regulatory authorities. The conducted study contributes to the enrichment of the specialty literature from the perspective of the contribution brought by integrated reporting to stakeholder communication process. Approaching this topic at a time when specialized literature has evolved from the phase of analysis and conceptual presentation of integrated reporting phenomenon towards the analysis of companies' practices in the field of IR and towards the establish of the impact of this type of reporting on entities, offers to this work uniqueness.

The work is divided into five chapters. In the first chapter, a short introduction accompanied by a motivation to the chosen theme is presented. The second chapter summarizes the interest of specialists regarding the importance of providing fast and compliant integrated information (financial - accounting but also non-financial) and the contribution brought by this reporting in the improving stakeholder communication process. The increased importance for all stakeholder categories for these new information categories is the result of the general interest in social and environmental issues and of the need to understand how businesses work. All this underlines the added value of non-financial information integrated within financial reporting, ensuring a natural connectivity between the various elements of the entity. Section number three describes the research methodologies but also some of this work limitations. The fourth section presents the international context of integrated reporting, the conceptual framework developed by the IIRC and the criticism inevitably brought to him. It continues by identifying the contribution of these reports to the improvement of stakeholder communication process from which it was described the financial information of interest to each of the different categories of stakeholders. From all of this, it revealed the extremely complex nature of integrated reporting systems that could have a significant influence on financial stability worldwide, but also the need to implement standardized normative. The biggest challenge is to establish the relationship between regulatory requirements and stakeholder needs. The last of the sections provides a synthesis of the results as well as opportunities for future research.

2. Literature review

The last decades have been characterized by innovation and the commercialization of innovation as a transfer of knowledge to the economy, and the creation of competitive advantages through the development of innovative projects has become an obvious concern of companies (Dobre, 2021), while the concerns of all specialized bodies are directed towards ensuring an unanimously accepted accounting reporting language with clear principles of application, as a foundation in the decision-making process (Ristea *et al.*, 2010). Eccles (2015) mentions the existence of three reporting practices: financial reporting, non-financial reporting and integrated reporting and that the latter tends to become predominant.

IR integrated reporting (Vittola *et al.*, 2019) is a new corporate reporting system that proposes to represent the added value of companies in the short, medium and long term and which focus on non-financial dimensions, including social and environmental aspects and national culture is a determining factor of the quality of these reports (Vittola *et al.*, 2019). The corporate reporting represents a complex presentation of both quantitative and qualitative information (historical, financial, various operations, environmental, figures and strategies) and their mandatory or voluntary reporting is view as a fundamental practice of recent years (Sarioglu, 2019).

Integrated reporting is an effective tool capable to provide information about the created value, on the one hand, and, on the other hand, it represents an organizational sustainability tool through the prism of the synergistic effect between the interests of different stakeholders (Gușe *et al.*, 2015) and, at the same time, a way to respond to the dynamic requirements of the market (Ionașcu *et al.*, 2020). Stakeholders, based on a "social contract", allow organizations to attract and to consume community resources with the aim of creating value for different stakeholder groups (Frías-Aceituno *et al.*, 2013) and the integrated reporting serve as a powerful means of managing information needs (Kuzey and Uyar, 2017), demonstrating how they create value and, in this way, obtaining the continuous support of stakeholders (Vaz *et al.*, 2016).

Among the internal and external factors that determine integrated reporting, the following can be found in the specialized literature: the size of the organization (determined by revenue for the year, net assets, market capitalization, etc.) (Buitendag *et al.*, 2017), external assurance (Gal and Akisik, 2020), business segment and financing need (Lee and Yeo, 2016).

The International Integrated Reporting Framework (IIRF) is a non-financial reporting tool for corporations, public bodies and other non-profit entities (Adams and Simnett, 2011; Samy, 2015; De Villiers *et al.*, 2017; Guthrie *et al.*, 2017). The purpose of the IIRF is to report the ability of an organization to generate added value based on the concept of integrated thinking (Adams, 2015) and taking into account the operational and functional relationships between the results and the resources attracted or affected (Coulson *et al.*, 2015). The main objective considered by the IIRC (2013) is to contain conclusive, meaningful information presented into a single integrated document capable to provide clear, concise, easily accessible information as reporting practice tends to transform into a sustainable performance reporting that integrates financial performance with social and environmental aspects (Ionașcu and Ionașcu, 2020). The initiatives and limits of the IIRC, as well as its relationships with other regulatory and standard-setting bodies in the field of financial and non-financial reporting, are extremely important, especially in the early stages of implementation and development (Morros, 2016; De Villiers *et al.*, 2017; Cheng, 2014).

Regarding the integrated reporting approach, there is no single assumption that explains the theoretical perspectives on this aspect, depending to a large extent on the particular context of the research. From the theoretical-explanatory perspective, several theories have been delimited: the legitimacy, stakeholder, institutional, agency and signal theories, but of all, those of stakeholders and legitimacy (Deegan, 2019; Daher and Bashatweh, 2018), followed by the institutional one tends to attract more and more researchers' attention (Dagilien, 2018).

Since the 1980s, reporting suitable information to stakeholders has been a key aspect of strategic management (Harrison *et al.*, 2020). Stakeholder theory provides a transcription of the integrated thinking concept, based on IIRF according to which all information intended to stakeholders must be managed as a whole (Harrison *et al.*, 2020) and organizations has the moral authority to balance the interests of all stakeholders (Freeman, 1984; Wangombe, 2013) and to recognize the profound influence of different interest groups on their activity success and longevity. This, while all interested parties, regardless of their level of power or influence, can hold the organization accountable (Fernando, S., Lawrence, S., 2014).

Aggregating information on issues such as corporate governance, information user needs, and other non-traditional requirements gives reporting opportunities and flexibility (Smith, 2014). The financial statements represent an essential departure point in investors or managers decision-making process, in financial institutions and financial analyst investigation, and between their quality there is a directly dependence. The first study that associate significantly and positively IR with stakeholder pressures is that of Vittola *et al.* (2019) which shows that the pressures from customers, employees, shareholders, environmental protection organizations, legislation determine the quality of IR and organizations must manage with maximum interest their relations with stakeholders who, in most cases, have expectations contrasting. (Chen *et al.*, 2010).

Into their integrated reports, companies generally tend to provide relevant information about risks and strategies, about governance and performance, financial and non-financial data aimed to meet the external user needs and less about those related to future prospects, about business development, about stakeholders relations, which brings into question the need to establish an international reporting framework (Petcharat and Zaman, 2019), especially as companies tend to respond to a mandatory legal framework rather than a voluntary one (Lungu *et al.*, 2013).

Although, in recent years, IR has been viewed with interest both by academics and professionals, the issue of quality´ reports is a critical aspect of IR and that because a very few of them are focused on quality and on its determinants (Vittola *et al.*, 2019).

Managers tend to present the results in less objective ways by presenting a companies´ favorable image although the results are not always positive (Săndulescu and Albu, 2018) and the specialized literature indicates numerous situations in which companies manipulate the results presentation (Albu *et al.*, 2020).

3. Research methods

The theoretical framework of the present research was analyzed in three directions: integrated reporting, the conceptual framework of integrated reporting and stakeholder communication process. So that, in order to fulfil the two established objectives, we considered it proper to analyze the relevant specialized literature from the WoS, Emerald, Scopus and de Gruyter databases, in order to cover the three assumed directions of theoretical research. The analyzed works can be found in the form of articles, books, doctoral theses, national, European and international legislative sources, websites of international professional bodies. Following this analysis, a series of characteristics and opportunities offered by integrated reporting resulted, as well as its broad spectrum of relationships with stakeholder and the multitude of interactions with the organizations' environment.

Like any other research work, even this one has its own limitations related to the general manner of presenting the concepts, with a high degree of theorizing notions without developing an empirical study that quantifies the numerical links between integrated reporting and stakeholder communication process.

4. Results and discussion

Integrated reporting appeared in the practice of entities since 2002 and, later developed through the prism of specialized literature, it was also addressed by international bodies in the field. The first conceptual framework on IR is considered to be the KING III report developed by the Integrated Reporting Committee of South Africa, followed by the framework developed by the IIRC (2013) and revised in 2020 (IFRS Foundation).

Organizations' ability to create value in a short, medium and long term can be influenced by a cohesive and effective approach of corporate financial reporting by integrating financial information with sustainable information and focused on material aspects (IIRC, 2013) and the IIRC's expectations have been linked on improving the communication way, considered at that time as being "numerous, disconnected and static communication" (IIRC, 2013, p. 2), based on the results of various researches on the benefits offered by such a reporting approach: the transformation of corporate processes (Brand and Rocchi, 2010); separation of operational processes from those of reporting reflected in better performing systems and processes; improving the decision-making process regarding the resources allocation (Frías-Aceituno *et al.*, 2013); reducing reputational risk and improving financial and non-financial decisions (Hampton *et al.*, 2012).

IR is reshaping the way that businesses operate and interact with the environment and it is reflected in addressing several different topics designed to cover the downsides of classic financial reporting. It is a mix between classic financial reporting and sustainable development reporting, completing the disadvantage presented by individual sustainability reports that are generally limited to presenting predictions and future plans, and do not contain sufficient quantitative-value indicators. Similar to the impact of the adoption of IFRS in the CEE region (Albu *et al.*, 2020), the extensive implementation of IR, through the support provided to the IIRC which requires a complex approach to financial performance from professional accountants (Dobre *et al.* 2017), could result in an improvement of the information quality. The complete story of an activity involves and other resources, apart from the historical data presented by the financial statements, resources on which the success of the entire organization depends: the quality and experience of human resources, the intellectual property, the research - development process, the interaction with the environment (Association of Charted Certified Accountants, 2017).

Despite IR many definitions encountered, their essence is the same: IR represents a concise communication based on integrated thinking of how the strategy, governance, performance and perspective of an organization in the context of the external environment leads to the creation of value in the short, medium and long term (IIRC, 2013); IR provides users a complete picture of how an organization's activity is performing by adding non-financial information related to the environment, society and governance along the financial information (Jeyaretnam and Niblock-Siddle, 2010); as a result of integrated reporting, it results a periodic communication that follows the value created by the company over time (PWC, 2014).

Integrated reports, as a result of integrated reporting, tend to replace traditional corporate reports and become the main companies reports (Flower, 2015; Frías-Aceituno *et al.*, 2013). Integrated reporting represents more than a corporate reporting framework (CIMA, 2014), it is able to create value by interconnecting all departments within the organization in order to formulate strategies and develop the decision-making process and their implementation within the business model; IR presents in a concise and real way the process of creating value both internally and externally, which improves the trust in the organization´ relationship with shareholders, investors, creditors, employees and other information users categories.

Integrated reporting represents, perhaps, the latest form of holistic development that marks the evolution of a refined format of financial and non-financial reporting, having a much more concise structure and based on well-determined guiding principles, graphically represented in Figure 1, which influences the content of reports as well as the presentation module. Starting from the definition of integrated reporting provided by the IIRC (IFRS Foundation, 2020) and from the terminology found in the specialized literature, eight content elements of integrated reporting can be identified, graphically represented in Figure 1, which are not mutually exclusive and between which there is an intrinsic link.

Organizations tend to emphasize the presentation of sustainability issues and less on the information needed by investors, which suggests the need to focus on reporting regulations on sustainable development indicators (Mitali, 2021). In order to avoid the indifference on certain information or the presentation of irrelevant information in the content of integrated reports, specific activities must be taken into account in the elaboration of the rules for drafting integrated reports (Shygun *et al.*, 2019; Ionașcu *et al.*, 2018). With all these differences generated by the specifics of the fields of activity, integrated reporting brings to organizations a series of advantages (Figure 2), enjoying a unitary acceptance by companies and can be a flexible tool for communicating how the value was created (Mitali, 2021). The quality of the corporate governance system is a mediating variable between the quality of the reporting system and the capital nature (Dragomir *et al.*, 2022).

IR improves business governance, develops investor relations and brings answers to all stakeholders by providing holistic information that presents the whole picture.

The management must direct the activity taking into account the interests of the stakeholders and objectively present to them all the necessary information and not only the financial ones, thus risking the loss of support from the users of non-financial information. Entities must responsibly address stakeholders with sustainable information in the light of internally and externally validated positive and normative accounting theories (Rodrigues and Morais, 2021).

The interdependence relationships between the financial and non-financial information needed by the interested parties in order to substantiate their own decisions, are reproduced in the most concise way through the IR. Organizations must respond to the informational needs of interested parties, regardless of the complexity of collection, qualification and reporting, process, the time required to complete this process, the costs and risks associated with this disclosure because the success of the business depends in a determining manner on the process of communication with the stakeholders.

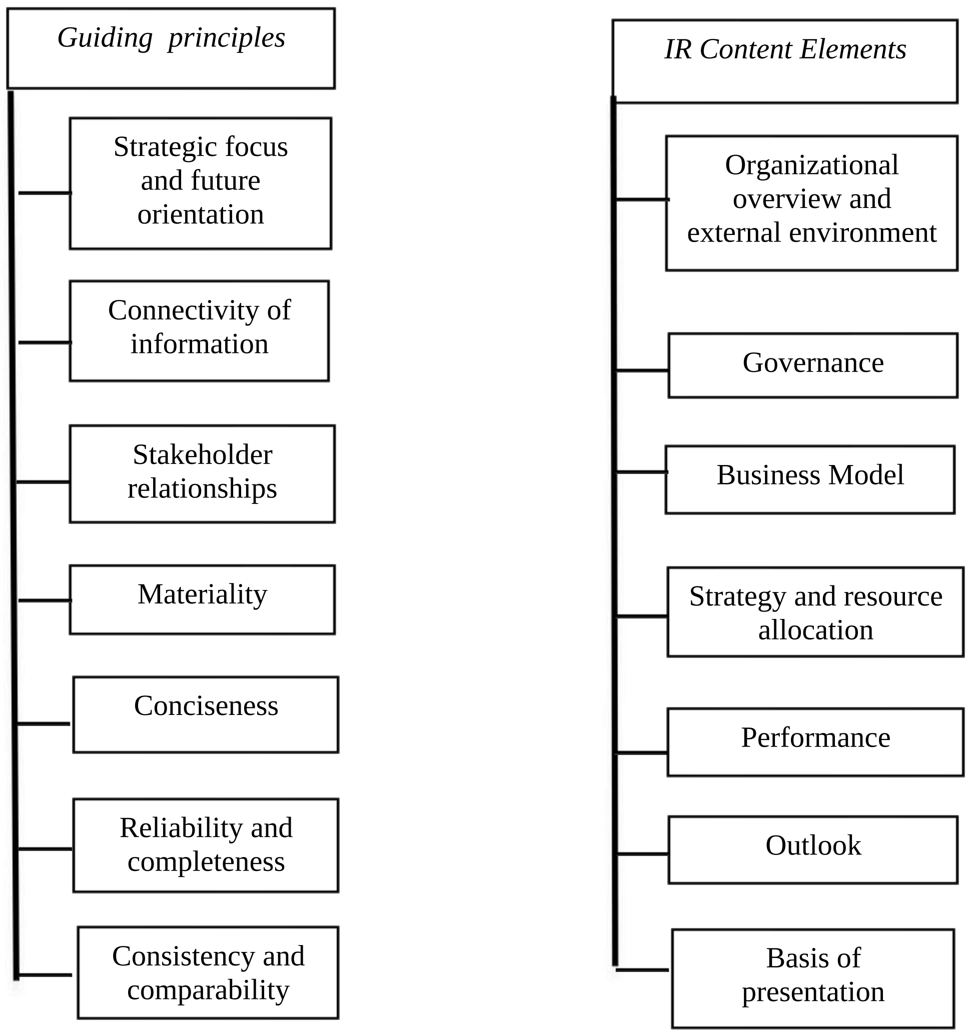

Figure no. 4. **IIRC Guiding Principles; Integrated Reporting Content Elements**
(*Source*: Authors, based on IIRF Foundation, 2020)

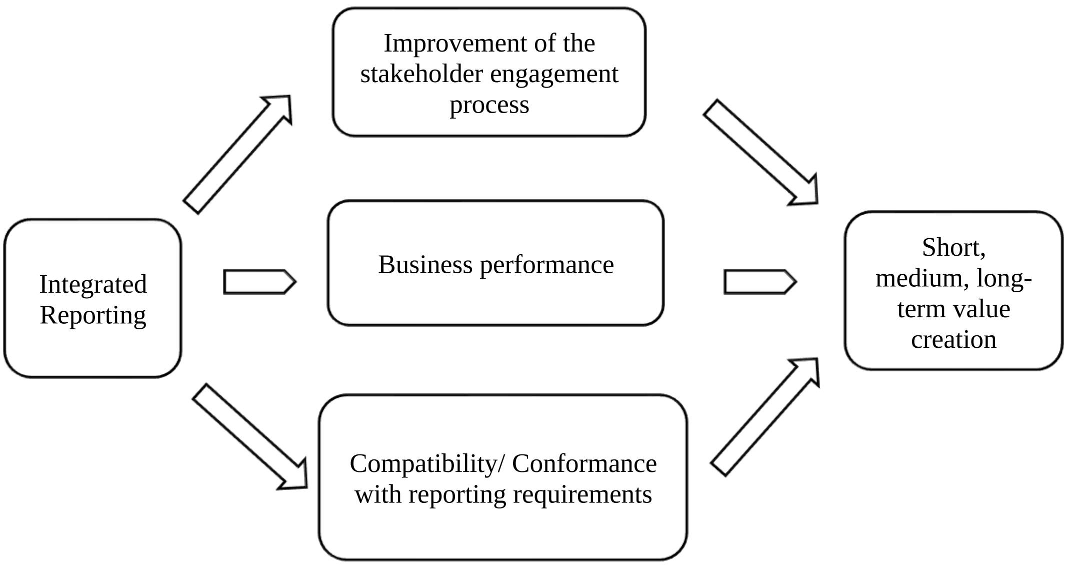

Figure no. 5. **The major benefits of integrated reporting**
(*Source*: Authors, based on Association of Charted Certified Accountants, 2017)

The integrated reporting conceptual framework resulting from the selected literature review, that guides integrated reporting practices in accordance with the IIRC guidelines in order to present in a unified manner all financial information related to strategy, governance, performance and future prospects were presented graphically in Figure 3.

Despite all the advantages offered by integrated reporting, this reporting framework has not been without its critics (Stubbs and Higgins, 2014; Higgins *et al.*, 2014; Rowbottom and Locke, 2013): the sustainable behavior of organizations is to less stimulated compared to the real current needs of society, the concepts regarding the elements of a non-financial nature are ambiguous, the most great emphasis is on the information needed by the capital holders, to the detriment of the other categories of interested persons (Cheng, 2014), there are no indicators on the integrated performance of the companies, high implementation costs, which limits the access of SMEs to this type of reporting.

Another extremely important aspect to improve is that of assumed responsibility, integrated reporting does not solve this problem of transparency of all information, especially those related to affiliated parts (Frías-Aceituno *et al.*, 2013), although it represents one of the among holding pillars of the IIRF reporting framework, it does not provide real guarantees regarding the observance of faithful images.

Stakeholders are not the primary beneficiaries of the value created by organizations, the organization creates value for itself and this blurs the explicit links between business practices, stakeholders and value (Cheng, 2014).

Although, in recent years, IR has been viewed with interest both by the academic environment and by professionals, the problem of the report quality represents a critical aspect of the IR and few reports are focus on quality and determinants, an aspect demonstrated by Raimo *et al.* (2021) that indicates the positive relationship between company size and clarity of reporting compared to profitability which has an insignificant impact. This is despite the fact that the main objective of introducing integrated reporting by the IIRC was to provide to all the interested parts clear, timely, accessible, relevant, credible and comparable information. The highest prominence score belongs to the interested parties who hold power, they are followed by those who possess legitimacy and only in third place are those who present an urgent interest (Feleagă *et al.*, 2018; Ionescu, 2020).

At this time, integrated reporting is not done in a real time, it refers to a certain moment in time and the transition to a digital language represents an essential step towards capitalizing on these possibilities, and, certainly, the digitization of these reports will be realized into a not-too-distant future.

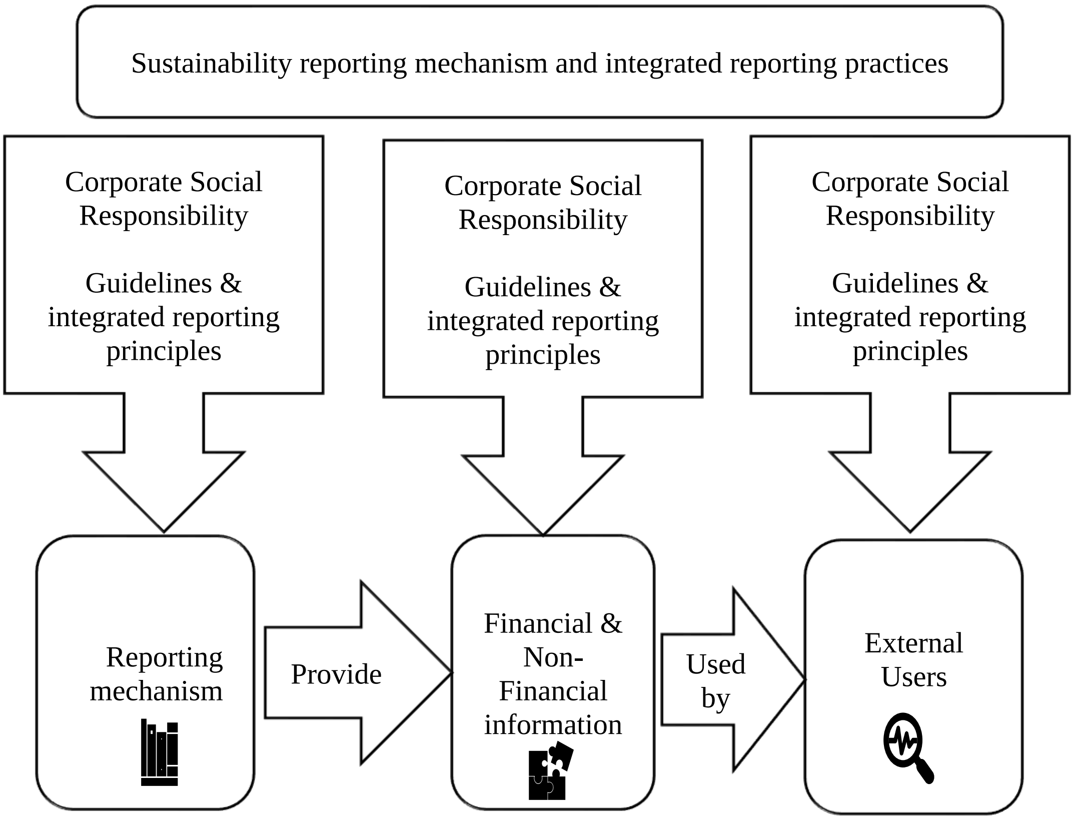

Figure 6. **A conceptual framework of integrated reporting mechanism**
(*Source*: Authors, based on IIRC)

Extending the commitment of integrated reporting to the other categories of companies could also have the effect of ensuring comparability, but all these procedures involve time and costs.

5. Conclusions

The approach of IR the concept in international literature and practice presents a unitary vision – it includes a complex process that requires visions, strategies, business models and information reporting to be carried out in relation to stakeholders. Economic, social and environmental performance, integration of financial and non-financial information, integrated thinking, value creation process and communication with stakeholders are elements closely related to IR.

The strengths of annual accounting financial reporting are enhanced in integrated reporting by joining the non-traditional information of organizations needed by stakeholders, and for this reason, the integrated reporting framework has gained importance and notoriety. The adoption of IR improves the decision-making process and has a positive impact on the value of the company, managing, over time, to respond to criticism related to the number of reports that companies are excessively committed to publish and the to their lack of connectivity.

IR came to meet the need of stakeholder to have access to other categories of information, as a new corporate reporting tool that improves the relationship with interested parties and responds to their needs and expectations, offering a holistic view of the companies' activity.

On the other hand, companies' decisions to change the way they communicate with stakeholders can lead to additional costs and risks, and it is absolutely necessary to support those decisions with additional analysis.

The conceptual framework is not a strict one, but rather a flexible one that draws the "boundaries" so that entities to prepare complete reports and to provide an overview of all aspects of interest to information users.

Global financial stability could be influenced by the quality of integrated reporting, but it remains a topical issue to determinate the relationship between regulatory norms and the needs of information users.

The specialized literature tends to develop from the phase of dissemination of the advantages offered by IR to the impact studies of IR application (Caraiani *et al.*, 2018) and the theoretical research in the field together with the practical experience of companies that have already implemented integrated reporting voluntarily or under regulation, can facilitate the actual process of implementing IR and lead to changing mindsets, which would result in a widespread extinction, "progress being impossible without change" (George Bernard Shaw).

References

Adams, C. (2015) The International Integrated Reporting Council: A Call to Action. *Critical Perspectives on Accounting,* vol. 27: 23-28

Adams, S. & Simnett, R. (2011) Integrated reporting: an opportunity for Australia's not-for-profit sector, *Australian Accounting Review,* vol. 21, no. 3: 292-301

Albu, C.N., Albu, N., Guinea, F.A. & Tsamenyi, M. (2020) Dealing with the visibility created by accounting numbers – A case study of cost accounting translation in a transitional economy, *Journal of Accounting in Emerging Economies*, vol. 10, no. 2: 277-303

Albu, N., Albu, C.N., Cho, C.H. & Pesci, C. (2022) Not on the ruins, but with the ruins of the past – Inertia and change in the financial reporting field in a transitioning country, *Critical Perspectives on Accounting*, In Press, 102535, doi:https://doi.org/10.1016/j.cpa.2022.102535

Albu, N., Albu, C.N., & Gray, S.J. (2020) Institutional factors and the impact of international financial reporting standards: the Central and Eastern European experience, *Accounting Forum,* vol. 44, no. 3: 184-214

Association of Charted Certified Accountants (2017) *Insights into Integrated Reporting.* Available on-line at https://www.integratedreporting.org/wp-content/uploads/2017/04/ACCAInsights_into_Integrated_Reporting.pdf

Buitendag, N., Fortuin, G.S., & De Laan, A. (2017) Firm characteristics and excellence in integrated reporting, *South African Journal of Economic and Management Sciences,* vol. 20, no. 1: 1-8

Caraiani, C., Lungu, C.I., Bratu, A., & Dascălu, C. (2018) Exploring the perspectives of integrated reporting for future research opportunities, *Accounting and Management Information Systems,* vol. 17, no. 4: 532-565

Chen, J.C., & Roberts, R.W. (2010) Toward a more coherent understanding of the organization– society relationship: A theoretical consideration for social and environmental accounting research, *Journal of Business Ethics,* vol. 97: 651-665

Cheng, Y. (2014) An Exploration into Cost-Influencing Factors on Construction Projects. *International Journal of Project Management,* vol. 32, no. 5: 850-860

CIMA, (2014) *Making the right.* London: CIMA.

Coulson, A.B., Adams, C.A., Nugent, M.N. & Haynes, K. (2015) Exploring metaphors of capitals and the framing of multiple capitals: challenges and opportunities for sustainability accounting, *Management and Policy Journal,* vol. 6, no. 3: 290-314

Dagilien, L. (2018) An institutional theory perspective on non-financial reporting: The developing Baltic context, *Journal of Financial Reporting and Accounting,* vol. 16, no. 4: 490-521

Daher, A. & Bashatweh, M. (2018). Accounting theory and its impact on adoption of sustainability reporting dimensions – A field study, *International Journal of Accounting and Reporting,* vol. 8, no. 4: 82-99

De Villiers, C., Venter, E.R. & Hsiao, P.C.K. (2017) "Integrated reporting: background, measurement issues, approaches and an agenda for future research, *Accounting and Finance,* vol. 57, no. 4: 937-959.

Dechow, N., Granlund, M., Mouritsen, J. (2007) Management Control of the Complex Organization: Relationships between Management Accounting and Information Technology, *Handbook of Management Accounting Research,* vol. 2: 625-640

Deegan, C. (2019) Legitimacy theory: Despite its enduring popularity and contribution, time is right for a necessary makeover, *Accounting, Auditing & Accountability Journal,* vol. 32, no. 8: 2307-2329

Dobre, E., Petrașcu, D., & Botina, M. (2017) Risks Management Profile in Local Public Services Administration, *Procedia Economics and Finance,* vol. 27: 204-208

Dobre, E. (2021) Implementation Assessment Approach for Market-Driven Projects, *"Ovidius" University Annals, Economic Sciences Series,* vol. 21, no. 2: 671-680

Dragomir, V.D., Dumitru, M., & Feleagă, L. (2022) The Predictors of Non-Financial Reporting Quality in Romanian State-Owned Enterprises, *Accounting in Europe,* vol. 19, no. 1: 110-151

Eccles, R. G. & Spiesshofer, B. (2015) Integrated Reporting for a Re-Imagined Capitalism, *Harvard Business School General Management Unit Working Paper No. 16-032,* available on-line at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2665737

European Parliament (2022) *EUR-Lex,* available on-line at https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=OJ:L:2022:322:TOC

Feleagă, L. Ionescu, B.S., & Dumitrașcu M.L. (2018) Sustainability in energy sector: A content analysis, in *Proceedings of the 13th International Conference Accounting and Management Information Systems AMIS 2018:* 619-627, Bucharest: Editura ASE, available on-line at https://amis.ase.ro/2018/docs/AMIS2018Proceedings.pdf

Fernando, S., & Lawrence, S. (2014) A theoretical framework for CSR practices: Integrating legitimacy theory, stakeholder theory and institutional theory, *The Journal of Theoretical Accounting,* vol. 10, no. 1: 149-178.

Flower, J. (2015) The international integrated reporting council: A story of failure, *Critical Perspectives on Accounting,* vol. 27: 1-17.

Freeman, R. (1984) *Strategic management: A stakeholder approach*. Cambridge.

Frías-Aceituno, J.V., Rodríguez-Ariza, & García-Sánchez L.I.M. (2013) Is integrated reporting determined by a country's legal system? An exploratory study, *Journal of Cleaner Production,* vol. 44: 45-55

Gal, G., Akisik, O. (2020) The impact of internal control, external assurance, and integrated reports on market value, *Corporate Social Responsibility and Environmental Management,* vol. 27, no. 3: 1227-1240

Gușe, R.G., Dumitru, M., Feleagă, L., & Feldioreanu, A. (2015) Emerging reporting practices of value creation and distribution in integrated reports. *Proceedings of the 10th International Conference Accounting and Management Information Systems AMIS 2015:* 533-5. Bucharest: Editura ASE

Guthrie, J., Manes-Rossi, F. & Orelli, R.L. (2017) Integrated reporting and integrated thinking in italian public sector organisations, *Meditari Accountancy Research*, vol. 25, no. 4: 553-573

Hampton, S.E., Tewksbury, J.J., & Strasser, C.A. (2012) Ecological Data in the Information Age, *Frontiers in Ecology and the Environment*, vol. 10, no. 2: 59-112

Hapwood, A., Unerman, J., & Fries, J. (2010) Introduction to the Accounting for Sustainability Case Studies. In A. U. Hapwood, *Accounting for Sustainability*: 4-22. London: Taylor & Francis Group

Harrison, J.S., Phillips, R.A. & Freeman, R.E. (2020) On the 2019 business roundtable "statement on the purpose of a corporation", *Journal of Management*, vol. 6, no. 7: 1223-1237

Higgins, C., Stubs, W., & Love, T. (2014) Walking the talk(s): Organisational narratives of integrated reporting, *Accounting, Auditing & Accountability Journal*, vol. 27, no. 7: 1090-1119

IFRS Foundation (2020) *Integrated reporting framework*, Available on-line at https://www.integratedreporting.org/resource/international-ir-framework/

IIRC (2013) *The international integrated reporting framework*, available on-line at https://www.integratedreporting.org/

Ionașcu, E., Mironiuc, M., Anghel, I., & Huian, M.C. (2020) The Involvement of Real Estate Companies in Sustainable Development – An Analysis from the SDGs Reporting Perspective, *Sustainability*, vol. 12: 798, doi:https://doi.org/10.3390/su12030798

Ionașcu, M., Ionașcu, I., Săcărin, M., & Minu M. (2018) Benefits of global financial reporting models for developing markets: The case of Romania, *Plos One Collection - Cancer & Social Inequity*, vol. 13, no. 1: e0207175, doi:10.1371/journal.pone.0207175

Ionescu, B.F. (2020) Stakeholder prioritization in european companies, in *Proceedings of the 15th International Conference Accounting and Management Information Systems AMIS 2020:* 403-410. Bucharest: Editura ASE.

Ionașcu, I., & Ionașcu, M. (2020) Corporate Reporting in the (Post)Modern Society: Reflections on Romania, *Audit financiar*, vol. 8, no. 1/57: 196-208

Jeyaretnam, T.L., & Niblock-Siddle, K. (2010) *The landscape of Integrated Reporting - Reflexions and Next Steps*, Cambridge: Harvard Business School.

KPMG International (2022) *Big shifts, small steps*, available on-line at https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2022/10/ssr-small-steps-big-shifts.pdf

Kuzey, C., & Uyar, A. (2017) Determinants of sustainability reporting and its impact on firm value: Evidence from the emerging market of Turkey, *Journal of Cleaner Production*, vol. 143: 27-39

Lee, K.W., & Yeo, G.H. (2016) The association between integrated reporting and firm valuation. *Review of Quantitative Finance and Accounting*, vol. 47, no. 4: 1221-1250

Ligteringen, E.X. (2013) Nautical traffic simulation with multi-agent system for safety. *Conference: 2013 16th International IEEE Conference on Intelligent Transportation Systems*, available on-line at http://dx.doi.org/10.1109/ITSC.2013.6728402

Lungu, C.I., Caraiani, C., & Dascălu, C. (2013) Reconsidering financial reporting from the perspective of corporate social and environmental responsibility. Romanian companies' approach, *Accounting in Central Europe*, vol. 13: 205-234.

Mallin, C.M. (2013) Monitoring Intensity and Stakeholders' Orientation: How Does Governance Affect Social and Environmental Disclosure? *Journal of Business Ethics*, vol. 114: 29-43

Mitali, A.L. (2021) Preparers' perceptions of integrated reporting: a global study of integrated reporting adopters, *Accounting & Finance*, vol. 62, no. S1: 1381-1420

Morros, J. (2016) The integrated reporting: A presentation of the current state of art and aspects of integrated reporting that need further development, *Intangible Capital*, vol. 12, no. 1: 336-356

Petcharat, N. & Zaman, M. (2019) Sustainability reporting and integrated reporting perspectives of Thai-listed companies, *Journal of Financial Reporting and Accounting,* vol. 17, no. 4: 671-694

Piechocki, M. (2007) XBRL Financial Reporting Supply Chain Arhitecture, available on-line at https://nbn-resolving.org/urn:nbn:de:bsz:105-1885266

PWC (2014) *Anticipating problems, finding solutions. Global Annual Review 2014,* available on-line at https://www.pwc.com/gx/en/global-annual-review/assets/pwc-global-annual-review-2014.pdf

Raimo, N., Vitolla, F., Minutiello, V., Marrone, A., & Tettamanzi, P. (2021) Readability of integrated reports: Evidence from worldwide adopters, *Corporate Social Responsibility and Environmental Management,* vol. 29, no. 3: 524-534

Reverte, C. (2015) The Integrated Reporting Movement: Meaning, Momentum, Motives and Materiality, *Journal of Cleaner Production,* vol. 86: 285-288.

Ristea, M., Jianu, I., & Jianu, I. (2010) Experiența României în aplicarea standardelor internaționale de raportare financiară și a standardelor internaționale de contabilitate pentru sectorul public (The Romanian Experience in the Implementation of the International Financial Reporting Standards and of the International Accounting Standards for the Public Sector), *Revista Transilvană de Ştiinţe Administrative*, vol. 1, no. 25, 169-192

Rodrigues, M.,A., & Morais, A.I. (2021) How to Challenge University Students to Work on Integrated Reporting and Integrated Reporting Assurance, *Sustainability,* vol. 13, no. 9: 10761, https://doi.org/10.3390/su131910761

Rowbottom, N., & Locke, J. (2013) The emergence of integrated reporting. *Asia Pacific interdisciplinary research in accounting conference,* Kobe: University of Birmingham, available on-line at https://research.birmingham.ac.uk/en/publications/the-emergence-of-integrated-reporting

Samy, M. (2015) Factors affecting the diffusion of integrated reporting–a UK FTSE 100 perspective, *Sustainability Accounting, Management and Policy Journal,* vol. 6, no. 2: 190-223

Săndulescu, S.M., Albu, C.N. (2018). Impression management in the letters to shareholders of listed entities: A Romanian case study. *Accounting and Management Information Systems, 17*(3), 353-373.

Sarioglu, M.D. (2019) The future of corporate reporting: integrated reporting, *International Journal of Contemporary Economics and Admministrative Science*, vol. 9, no. 2: 327-347

Shygun, M.M., Bezverkhiy, K.V., & Kovach, S.I. (2019) Development of integrated enterprise reporting structure, *Financial and credit activity-problems of theory and practice,* vol. 2, no. 29: 258-268.

Smith, W. (2014) Dynamic Decision Making: A Model of Senior Leaders Managing Strategic Paradoxes, *Academy of Management Journal,* vol. 57, no. 6: 1592-1623, https://doi.org/10.5465/amj.2011.0932

Stubbs, W., & Higgins, C. (2014) Integrated Reporting and internal mechanisms of change. *Accounting, Auditing & Accountability Journal,* vol. 27, no. 7*:* 1068-1089

Vaz, N., Fernandez-Feijoo, B., & Ruiz, S. (2016) Integrated reporting: An internationa overview, *Business Ethics: A European Review*, vol. 25, no. 4: 577-591

Vittola, F., Raimo, N., Rubino, M., & Garzoni, A. (2019) How pressure from stakeholders affects integrated reporting quality, *Corporate Social Responsability and Environmental Management,* vol. 26, no. 6: 1591-1606

Vittola, F., Raimo, N., Rubino, M., & Garzoni, A. (2019) The impact of national culture on integrated reporting quality. A stakeholder theory approach, *Business Strategy and the Enviroment,* vol. 28, no. 8: 1558-1571

Wangombe, D. (2013). Multi-Theoretical Perspective of Corporate Environmental Reporting: A Literature Review, *Review of Integrative Business & Economics Research*, vol. 2, no. 2: 655-671

SECTION 6 Financial reporting 2

Intellectual Capital and Bank's Financial Performance in North Macedonia: An Empirical Investigation

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Abstract: *This study examines the impact of intellectual capital on banks' financial performance in North Macedonia. The Value-Added Intellectual Coefficient (VAIC) and its subcomponents, Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency (CEE), are specifically examined in relation to Return on Assets (ROA) and Return on Equity (ROE). The findings demonstrate that the VAIC and its components have a statistically significant and positive influence on both ROA and ROE. The research used linear regression models to examine the relationship between intellectual capital and banks' financial performance. These results imply that banks may increase their financial performance by investing in intellectual capital and offer empirical support for the notion that intellectual capital is a significant predictor of banks' financial success in North Macedonia. This research strengthens the existing research on intellectual capital and financial performance by investigating this relationship in the context of a specific country and employing a comprehensive measure of intellectual capital. The paper's novelty stems from its investigation of the relationship between intellectual capital and financial performance in the banking sector in North Macedonia, a country that has gotten little attention in the intellectual capital literature. Moreover, we employ the VAIC, a comprehensive measure of intellectual capital that captures the multifaceted aspect of intellectual capital. The study has certain limitations despite these contributions: first, it is based on a particular country context, which may limit the results' external validity, and second, it only examines the effect of intellectual capital on two financial performance indicators.*

Keywords: *Intellectual capital, financial performance, North Macedonia.*

1. Introduction

The issue of intellectual capital has grown in significance in the current corporate environment as companies understand the worth of their intangible assets and look for methods to quantify and manage them. Knowledge, talents, and other intangible resources that help businesses produce value and compete in the market are referred to as intellectual capital. As banks rely on their knowledge and experience to offer financial services to consumers and compete in the market, intellectual capital might be particularly crucial in the banking sector. Recent years have seen a tremendous expansion in the body of knowledge about the relationship between intellectual capital and financial performance, which is a reflection of the growing significance of intangible assets in today's corporate environment. Although the term "intellectual capital" (IC) has been defined in a number of different ways, it is commonly used to

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describe the knowledge, skills, and other intangible assets that allow businesses to produce value and compete in the market. The idea of intellectual capital has been used in a variety of fields and businesses, including banking.

When measuring an organization's intellectual capital, many approaches may be used. The subjective character of intellectual capital makes it challenging to identify and choose the best approach. Besides the difficulty, several researchers have put forward numerous approaches for estimating intellectual capital. The Value-Added Intellectual Coefficient (VAIC), created by Pulic (1998) and utilized in a variety of businesses and sectors, is one commonly accepted indicator of intellectual capital. The VAIC is a comprehensive intellectual capital metric that encompasses the value provided by a company's human, structural, and relational capital. Human Capital Efficiency (HCE), Structural Capital Efficiency (SCE), and Capital Employed Efficiency are the components of the VAIC (CEE). HCE evaluates a firm's efficiency in using human capital, SCE measures its efficiency in using structural capital, and CEE measures its efficiency in using capital employed.

Prior studies on intellectual capital and financial performance in the banking industry have had varying degrees of success. While some studies have identified a substantial or even a negative correlation between intellectual capital and financial success, others have found no meaningful correlation at all. The difficulty in quantifying intellectual capital and the challenges in accounting for other variables that can have an impact on financial success may be contributing causes to the inconsistent outcomes. The banking industry in North Macedonia has seen considerable changes recently, including heightened competition and regulatory changes. In light of this, it's critical to comprehend how intellectual capital affects banks' financial performance. An empirical analysis of the effect of intellectual capital on banks' financial performance in North Macedonia is presented in this research. In order to determine the relationship between the VAIC and its components and the financial performance of banks as shown by Return on Assets (ROA) and Return on Equity (ROE), the study used linear regression models. Ten banks that were active in North Macedonia between 2012 and 2021 make up the sample.

The following parts of the paper are structured as follows. A review of the literature on intellectual capital and financial success is given in Section 2. The research methodology, including the procedures for sample selection, data collecting, and analysis, is presented in Section 3. After a discussion of the implications of the findings for banks and managers in Part 4, which also includes the estimated coefficients and statistical significance of the VAIC and its components, Section 6 wraps up the entire paper. The research contributes to the existing body of knowledge by investigating the impact of intellectual capital on financial performance in the banking industry of North Macedonia, and it aims to address the inconsistencies in prior studies regarding this relationship. The study also establishes hypotheses and ensures that the regression model satisfies key assumptions such as linearity, normal distribution, homoscedasticity, absence of multicollinearity, and absence of autocorrelation.

2. Literature review

A wide range of academic fields and business sectors are covered in the extensive literature on IC measurement and reporting. The requirement for organizations to adopt a systematic strategy for monitoring and reporting on their IC is a recurring subject in this work. The book "The New Organizational Wealth" by Sveiby (1997), which established the idea of IC and presented a framework for its measurement and management, is one of the first and most important publications in this field. Since then, a variety of methods for measuring and disclosing IC have been put forth.

Several studies have concentrated on creating particular metrics for evaluating each of the IC's constituent parts, such as customer capital (Edvinsson and Malone, 1997) or human capital (Bontis, 1998). Some others have suggested more comprehensive strategies that aim to encompass the whole range of IC, such as the Balanced Scorecard (Kaplan and Norton, 1996) or the Intellectual Capital Navigator (Bontis *et al.*, 2001).

Pulic (1998), who created the VAIC model, carried out one of the early research on intellectual capital and financial success. The VAIC model analyzes the link between the firm's physical and financial capital and its human, structural, and relational capital to determine the value that a company produces through its intellectual capital. VAIC model has a number of advantages (Firer and Williams, 2003; Laing *et al.*, 2010; Nimtrakoon, 2015): First, VAIC provides a direct and easy method for calculating the value of intellectual capital that enables stakeholders to assess overall resources and the effectiveness of their value creation. Second, because the information came from audited corporate financial reports, VAIC is unbiased and verifiable. Finally, because the audited corporate financial reports are a similar source of data, VAIC enables comparisons between organizations or countries. Fourth, businesses may assess their own intellectual capital and business performance using VAIC. Despite its many benefits, the VAIC as a tool for measuring the efficiency of intellectual capital has a number of drawbacks, including the exclusion of some factors that are thought to be of an intellectual nature, such as R&D spending, intellectual property, and relational capital (Joshi *et al.*, 2013; Mohammad *et al.*, 2018). Another disadvantage of VAIC addressed in the literature is its inadequacy to measure intellectual capital in companies with negative operating profit, consequently VAIC does not produce valuable assessment in firms with more inputs than outputs (Chu, 2011). In their study, concerning Intellectual capital and financial performance of Indian banks, Mondal and Ghosh (2012) find that banks' intellectual capital is crucial for their competitive advantage. Their research reveals that there are a variety of relationships between a bank's intellectual capital performance and financial performance metrics, such as profitability and productivity. The results of a survey of a sample of all listed banks during 2008 to 2010 show that the IC performance of Saudi banks is low and positively related to the financial performance indicators of the banks, but, when VAIC is broken down into its components, the relationships between these components and banks' financial performance indicators differ (Al-Musali and Ismail, 2014). An empirical study conducted in Thailand discovered that a firm's intellectual capital has a significant positive relationship with its shareholders' capital gains on shares (Appuhami, 2007).

The results of the Ozkan *et al.* (2017) study indicate that the human capital efficiency coefficient (HCE) is the main factor affecting the intellectual capital of the Turkish banking sector. On the contrary, capital employed efficiency coefficient (CEE) and structural capital efficiency coefficient (SCE) becomes less efficient at generating value with in banking sector especially in comparison to HCE.

According to Joshi *et al.* (2013), the performance of the different VAIC components and overall VAIC varies across all subsectors in the Australian financial sector, with investment companies having higher value VAIC due to higher levels of human capital efficiency than banks, insurance companies, diversified financials, and RIETs.

An empirical investigation in an Iranian company found that the relationships between a company's intellectual capital performance and profitability, employee productivity, and sales growth are informative, implying that a company's intellectual capital performance can explain profitability and productivity (Ahangar, 2011). Likewise, Maditinos *et al.* (2011) discovered a statistically significant link between financial success and human capital efficiency.

The findings of Ismail and Karem's (2011) study provide credence to the idea that intellectual capital influences Bahraini banks' financial success. Moreover, they discover that financial success is favorably correlated with capital employed efficiency (CEE) and human capital efficiency when VAIC is divided into its three main components (HCE). Nevertheless, their research did not uncover any conclusive links between structural capital efficiency (SCE) and bank financial performance. Soewarno and Tjahjadi (2020) draw the conclusion that, generally speaking, intellectual capital influences financial performance from their empirical study of the relationship between intellectual capital and the financial performance of Indonesian banking institutions. Their findings shed new light on the relationship between each element of intellectual capital efficiency (human capital, structural capital, employed capital, and innovation capital) and financial performance (return on asset, return on equity, asset turnover, and price to book ratio), and they also support the need for future advancements in intellectual capital measurement.

Tasawar and Haniffa (2017) identified a significant association between VAIC and accounting profitability in Islamic banks measured by return on assets (ROA). Their findings also show that accounting performance has a substantial positive association with capital employed efficiency (CEE) and human capital efficiency (HCE), but no significant relationship with structural capital efficiency (SCE). Altogether, their findings imply that HCE and CEE have a significant impact on the ability of Islamic banks to create profit. Haris *et al.* (2019) show both the linear and non-linear influence of IC performance on profitability in their study on Pakistani banks, confirming an inverted U-shaped connection. Capital employed efficiency (CEE) and human capital efficiency (HCE), two of the three value-added intellectual coefficient (VAIC) components, are discovered to have a significantly positive impact on bank profitability, while structural capital efficiency (SCE) is discovered to have a significantly negative impact. Forte *et al.* (2019) found that, when taken in its aggregate form, IC exerts a positive impact on firms' financial performance as measured by firms' profitability and growth in revenues as well as on market value. Their empirical study was developed using data drawn from a sample of 135 Italian listed companies for the period from 2008 to 2017. Nonetheless, when its constituent parts are taken into account, only Human Capital Efficiency exhibits a positive impact on organizations' financial performance, whilst Structural Capital Efficiency and Capital Employed Efficiency do so in the other direction. Surprisingly, their analysis shows that the market value of enterprises is adversely impacted by each of the various IC components. The intellectual capital components affect the performance of the Portuguese banks, and should thus be a wager on upcoming strategic choices (Neves and Proença, 2021).

In their study, Anik *et al.* (2021) examine how the financial performance of banking companies serves as a mediator between intellectual capital, Good Corporate Governance (GCG), and Corporate Value, revealing that the financial performance effectively mediates the relationship between intellectual capital and GCG. Xu *et al.* (2022) investigated the impact of intellectual capital (IC) on bank profitability during the COVID-19 pandemic using data from 34 Chinese banks and 39 Pakistani banks. Their study found that IC, particularly human capital, remained positively influential on the profitability of both Chinese and Pakistani banks during the pandemic, suggesting the importance of policymakers focusing on IC resources to enhance banks' profitability even in crisis situations.

In their study, Buallay *et al.* (2020) examined the impact of intellectual capital efficiency on the operational, financial, and market performance of banks, finding a positive relationship between intellectual capital efficiency and financial performance (ROE) and market performance (TQ), which highlights the need for banks to investigate the reasons behind the imperfect relationship between intellectual capital and asset efficiency (ROA).

The research findings by Ivanovic *et al.* (2021) show that CEE is the most significant component of IC, HCE has a negligible effect, and SCE has a detrimental effect on the financial outcomes of agricultural firms in West Balkan countries. Using a slightly different approach and methodology, namely factor analysis, in addition to multiple regression analysis, Paunović (2021) discovered that human capital elements such as entrepreneurial team interaction, social skills and tenacity, and entrepreneur knowledge have a positive impact on ROA in entrepreneurial firms in Serbia.

3. Research methodology

The study focuses on the banking industry in the Republic of North Macedonia. This industry includes 12 banks, two of which were omitted from the analysis because they had a negative operating performance during the investigated 10-year period (2012-2021). The total number of observations is 100 as a result of a 10-year analysis of 10 banks. Data was gathered from a variety of sources, including the Macedonian Stock Exchange's website (www.mse.mk), the system for electronic information for listed joint-stock companies' website (www.seinet.com.mk), and the individual websites of the banks. Table 1 summarizes the variables that were used.

Table 1. **Description of the variables**

Variables	**Abbreviation**	**Measurement**
Value-Added Intellectual Coefficient	VAIC	Sum of HCE, SCE and CEE
Human Capital Efficiency	HCE	Value-Added / Human Capital
Structural Capital Efficiency	SCE	Structural Capital / Value-Added
Capital Employed Efficiency	CEE	Value-Added / Capital Employed
Return on Assets	ROA	Ratio between net profit after tax and total assets.
Return on Equity	ROE	The Ratio between net profit after tax and shareholders' equity

(*Source*: Authors' elaboration)

The VAIC model is designed to assess the degree to which a company generates added value through intellectual (capital) efficiency or intellectual resources. VAIC calculations are based on three factors: human capital (HC), which is essentially regarded as employee expenditures; structural capital (SC), which the difference between produced Value-Added (VA) and human capital (HC), i.e., SC = VA - HC; and capital employed (CE), which is interpreted as financial capital plus physical capital(Financial Capital (FC) = Cash and Balances with Central Bank Amounts + Financial Assets (Net) at Fair Value through Profit or Loss + Banks + Receivables from the Money Market + Available for Sale Financial Assets(Net) on the Balance Sheet, while Physical Capital (PC) = Tangible - Fixed Assets (Net) on the Balance Sheet). In accordance with these definitions and assumptions, VAIC is calculated as the direct sum of 3 efficiency ratios:

1) ***Human capital efficiency (HCE) = VA / HC;***

2) ***Structural capital efficiency (SCE) = (VA - HC) / VA or SC / VA; and***

3) ***Capital employed efficiency (CEE) = VA / CE***.

Intellectual capital efficiency (ICE) is described as ICE = HCE + SCE as an intermediate outcome, and VAIC = ICE + CEE as a final outcome.

In order to determine a company's proficiency, we must first determine how well it generates Value-Added (VA), which is measured as the difference between output and input: VA = OUT - IN. OUT denotes banks' operating revenues, which include interest income, fees and commission income, and other operating income; IN denotes banks operational costs, which include interest, finance, administration, and other operating expenses (excluding personnel expenses, which are treated as investments but not costs). Labor costs can no longer be considered costs because of their active participation in the value generation process. Value added is a byproduct of ongoing operations and conveys the newly acquired wealth of a specific time period.

By incorporating VAIC into the analysis, the study aims to capture the overall effectiveness of intellectual capital utilization in generating value and enhancing the financial performance of banks. This composite measure allows for a more comprehensive evaluation of the relationship between intellectual capital and profitability, considering not only human capital but also the structural and capital employed aspects. The use of VAIC in the paper demonstrates a recognition of the multidimensional nature of intellectual capital and its relevance in the banking industry. It provides a framework for understanding how banks can leverage their knowledge, talents, and resources to achieve better financial outcomes. By examining the impact of VAIC and its components on Return on Assets (ROA) and Return on Equity (ROE), the study offers valuable insights into the specific areas of intellectual capital that contribute most significantly to banks' financial performance.

The research is quantitative and aims to determine whether the independent variable(s) (VAIC, and it's components: HCE, SCE, CEE) affect the dependent variables (ROA and ROE). In order to fulfill the purpose of the research, a linear regression was performed, using the SPSS software package. A simple linear regression estimates the relationship between a response (dependent) variable y, and a single explanatory (independent) variable x, given a set of data that includes observations for both of these variables for a particular sample. Multiple linear regression extends simple linear regression to include more than one explanatory variable (Tranmer *et al.*, 2020). The model is formulated as follows:

Simple linear regression model: $\boldsymbol{Y = \beta 0 + \beta 1X + \mathcal{E}}$

Multiple linear regression model: $\boldsymbol{Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \mathcal{E}}$

Where: **Y = ROA/ROE; X = VAIC; X1 = HCE; X2 = SCE; X3 = CEE, and $\boldsymbol{\mathcal{E}}$ = random error.**

Considering the purpose of the research, the following hypotheses were developed:

> ***H1**: The efficiency of intellectual capital, measured through the Value-Added Intellectual Coefficient (VAIC) has a positive and significant impact on Return on Assets (ROA) in Macedonian banks.*
>
> ***H2**: The efficiency of intellectual capital, measured through the Value-Added Intellectual Coefficient (VAIC) has a positive and significant impact on Return on equity (ROE) in Macedonian banks.*

ROA is chosen as a performance indicator because it reflects the profitability of a bank in relation to its total assets, providing insights into the efficiency of asset utilization. ROE, on the other hand, measures the profitability of a bank in relation to its shareholders' equity, indicating the return generated for the shareholders' investment. By using both ROA and ROE as dependent variables, the paper aims to comprehensively assess the financial performance of banks and evaluate the impact of intellectual capital on their profitability and returns. A multiple linear regression model must first satisfy a number of conditions in order to be effective and trustworthy. The initial presumption is that the dependent and independent variables have a linear relationship. Because standard multiple regression cannot accurately estimate the relationship between the dependent variable and independent variables when the relationship between the independent variables and the dependent variable is not linear, the results of the regression analysis will overstate the true relationship (Osborne and Waters, 2002). The existence of normal distributions for variables is the second presumption. Correlations and significance tests can be affected by non-normally distributed variables (variables that are highly skewed or kurtotic, or variables with substantial outliers) (Osborne and Waters, 2002). The next presumption is homoscedasticity. When the variance of errors is the same across all levels of the independent variables, this is referred to as homoscedasticity. When the variance of errors varies at various values of the independent variables, heteroscedasticity is evident (Osborne and Waters, 2002). Slight heteroscedasticity has no impact on significance tests, according to Berry and Feldman (1985) and Tabachnick and Fidell (2001), but large heteroscedasticity can substantially weaken the analysis and distort results, increasing the chance of a Type I error. Multicollinearity can occasionally cause severe problems when it is modest, but when it is moderate to large, it becomes an issue that has to be handled (Daoud, 2017). Absence of autocorrelation is another aspect of a successful model. The development of autocorrelation is typically caused by the residuals' lack of independence (Getis, 2007).

4. Results and discussion

The tested assumptions for multiple linear regression will be presented and discussed before the regression model's findings are revealed, in order to determine whether the Value-Added Intellectual Coefficient (VAIC) and its components (HCE, SCE, and CEE) have an impact on the financial profitability indicators (ROA and ROE) of Macedonian banks.

Figure 1 illustrates the results, which demonstrate the linearity between the variables. In particular, nearly all of the points in Figure 1 are roughly on a straight line, which suggests a linear relationship.

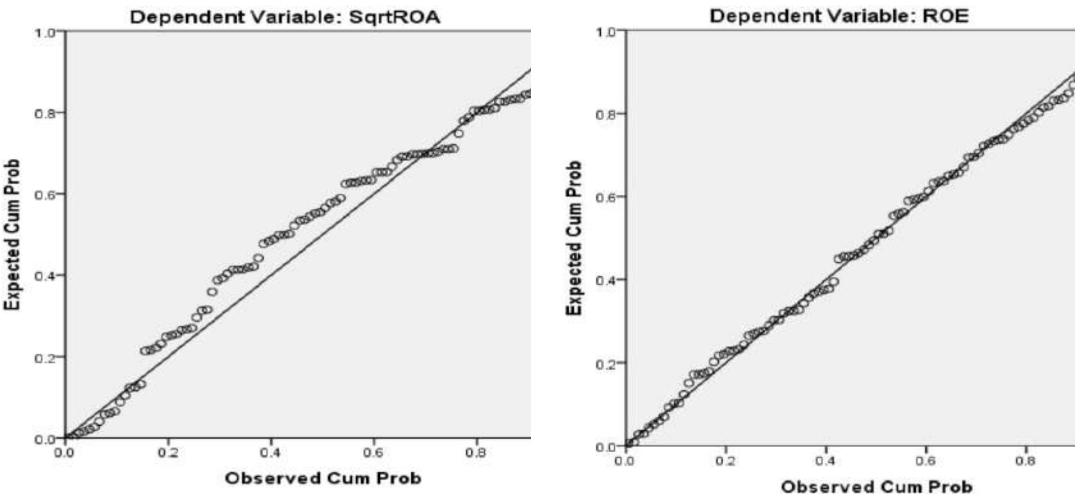

Figure 1. **Linearity**
(*Source*: Author's elaboration)

A normality test was also done, which tested the assumption of a normal distribution of the dependent variables' residuals (ROA and ROE). This assumption is tested in SPSS using the Kolmogorov-Smirnov and Shapiro-Wilk tests, and the outcomes are presented in Table 2.

Table 2. **Tests of Normality**

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
ROA	.092	100	.038	.943	100	.000
SqrtROA	.067	100	.200	.980	100	.126
ROE	.056	100	.200	.974	100	.047

(*Source*: Authors' elaboration)

Table 2 shows that during the initial testing of the assumption of normality of the dependent variables (ROA and ROE). The test revealed that ROA does not have a normal distribution of the residuals, i.e., the p-value (Sig.) in both tests (Kolmogorov-Smirnov and Shapiro-Wilk) is less than 0.05 (the deviation of the distribution of the data from normality is statistically significant), whereas ROE does have a normal distribution of the residuals according Kolmogorov-Smirnov test (p>0.05), while Shapiro-Wilk test shows value (0.047) which is almost at the cut-off value (0.05). To fulfill this requirement for ROA, this dependent variable was transformed in SPSS using Square Root (and named SqrtROA), after which we can see that it now satisfies the assumption of residual normality and is useful in further testing of the regression model (Osborne, 2002). In other words, both the Kolmogorov-Smirnov and the Shapiro-Wilk tests provide results larger than 0.05.

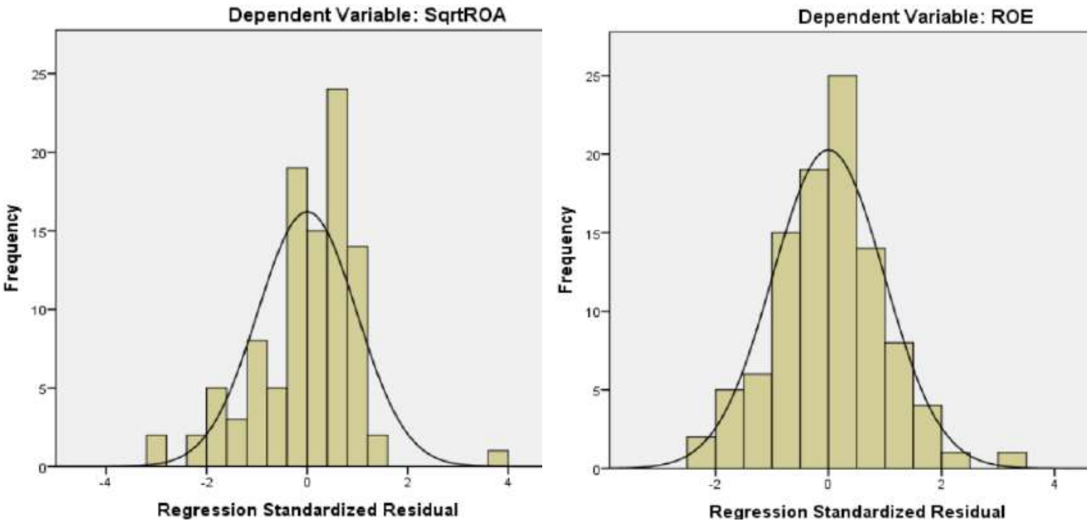

Figure 2. **Distribution of the residuals**
(*Source*: Authors' elaboration)

The graphical display further shows that the assumption of normalcy is satisfied. The dependent variable's distribution is represented visually in Figure 2, where it is clear that its residuals follow a normal distribution. The use of SqrtROA allows for accurate modeling and analysis, ensuring that the results are valid and can be interpreted with confidence. This transformed variable serves as a substitute for ROA in assessing the impact of the independent variables (VAIC and its components) on the financial performance of Macedonian banks. By employing SqrtROA in the regression model, the study can provide meaningful insights into the relationship between intellectual capital and the profitability of banks, enabling a more accurate evaluation of the impact and significance of the independent variables.

Table 3. **Tests of Collinearity**

Model	Tolerance		**VIF**	
(Constant)	ROA	ROE	**ROA**	**ROE**
HCE	.408	.408	**2.451**	**2.451**
SCE	.463	.463	**2.160**	**2.160**
CEE	.588	.588	**1.700**	**1.700**

(*Source*: Authors' elaboration)

The collinearity test is shown in Table 3. This aids in identifying the presence or absence of multicollinearity among the independent variables. The Variance Inflation Factor (VIF) must be smaller than 10 in order to satisfy the multicollinearity absence condition (O'brien, 2007). The absence of multicollinearity, which indicates that there is no correlation between the independent variables, may be concluded from the collinearity statistics of the test, which show that VIF is less than 10. In Figure 3, the assumption of heteroskedasticity is illustrated visually, and it can be seen that the values are clustered around zero. This shows that the variance of errors is almost the same at all levels of the independent variables, leading us to the conclusion that heteroscedasticity is not present.

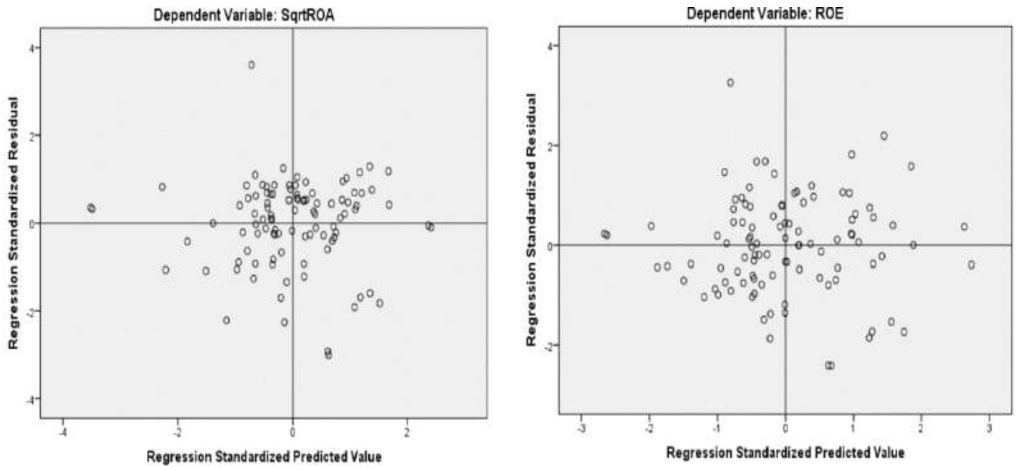

Figure 3. **Scatter Plot**
(*Source*: Authors' elaboration)

The Durbin-Watson test was used to examine the autocorrelation assumption, which was the final one. In order for there to be no autocorrelation, the p-value for the test must be higher than 0.05 (Tillman, 1975). We may infer that there is no autocorrelation because the test values for both regression models, SqrtROA (1.128) and ROE (1.008), are larger than 0.05 (Table 4).

Table 4. **Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson Test
SqrtROA	.741	.549	**.535**	.02696	**1.128**
ROE	.661	.437	**.420**	.04033	**1.008**

(*Source:* Authors' elaboration)

Once the preceding tests have demonstrated that the assumptions for relevant and accurate regression models are satisfied, the models may be run to assess if the independent variables (VAIC and its components HCE, SCE, and CEE) impact the dependent variables (SqrtROA and ROE). At first, the Simultaneous F test was used to determine if the independent variables affect the dependent variables simultaneously, i.e., whether the sample data are adequate to draw the conclusion that the regression model fits the data more closely than the model with no independent variables (Steiger, 2004). Table 5 displays the findings, and it reveals that the test value is statistically significant because it is less than 0.05. (0.000 for both SqrtROA and ROE). This indicates that the independent variables (HCE, SCE, and CEE) are influencing the dependent variables simultaneously (SqrtROA and ROE).

Table 5. **ANOVA Simultaneous F Test**

Model		Sum of Squares	df	Mean Square	F	Sig.
SqrtROA	Regression	.085	3	.028	38.893	**.000**
	Residual	.070	96	.001		
	Total	.155	99			
ROE	Regression	.121	3	.040	24.874	**.000**
	Residual	.156	96	.002		
	Total	.278	99			

(Source: Authors' elaboration)

We may now test the multiple linear regression model after confirming that the independent variables affect the dependent variable simultaneously. Table 6 exhibits the model testing results' calculated coefficients.

Table 6. **Multiple Linear Regression Model - Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations		
		B	Std. Error	Beta	T	Sig.	Zero-order	Partial	Part
SqrtROA	(Constant)	.008	.011		.748	.456			
	HCE	.010	.003	.326	3.035	.003	.678	.296	.208
	SCE	.033	.012	.265	2.629	.010	.643	.259	.180
	CEE	1.112	.385	.259	2.891	.005	.609	.283	.198
ROE	(Constant)	-.017	.016		- 1.088	.279			
	HCE	.019	.005	.455	3.799	.000	.638	.361	.291
	SCE	.014	.019	.086	.762	.448	.521	.078	.058
	CEE	1.120	.575	.194	1.946	.045	.526	.195	.149

(Source: Authors' elaboration)

From the results in Table 6, we can conclude that the components of VAIC (HCE, SCE and CEE) have a statistically significant and positive impact on both, SqrtROA and ROE. More specifically, the p-value of all three independent variables is lower than the critical value (0.05), except the SCE coefficient for ROA, and the correlation coefficients are positive. This conclusion leads to the rejection of the null hypotheses and acceptance of the alternative hypotheses, i.e. H1: The efficiency of intellectual capital, measured through the Value-Added Intellectual Coefficient (VAIC) has a positive and significant impact on Return on Assets (ROA) in Macedonian banks, and H2: The efficiency of intellectual capital, measured through the Value-Added Intellectual Coefficient (VAIC) has a positive and significant impact on Return on equity (ROE) in Macedonian banks. We reach the same conclusion if we apply a simple linear regression, where instead of three independent variables (HCE, SCE and CEE) have we will take the VAIC as one independent variable. Table 7 displays the simple linear regression findings, and it reveals that VAIC has a statistically significant and positive influence on both, SqrtROA and ROE. This means that the simple linear regression results lead to the same conclusion as the multiple linear regression results.

Table 7. **Simple Linear Regression Model - Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations		
		B	**Std. Error**	**Beta**	T	Sig.	**Zero-order**	**Partial**	**Part**
SqrtROA	(Constant)	.030	.007		4.255	.000			
	VAIC	.018	.002	.704	9.826	**.000**	.704	.704	.704
ROE	(Constant)	.006	.010		.598	.551			
	VAIC	.023	.003	.645	8.355	**.000**	.645	.645	.645

(*Source:* Authors' elaboration)

The coefficient of determination (Adjusted R Square), which varies from 0 to 1, is used to measure the degree of the influence of the independent factors on the dependent variables; the closer it is to 1, the stronger the association (Harel, 2009). In our situation, this coefficient is 0.535 for SqrtROA and 0.420 for ROE (see Table 4 above), indicating that the regression link is moderately strong. In other words, the independent variables (VAIC and its components: HCE, SCE, and CEE) explain only 53.5% of the changes in SqrtROA and 42% of the changes in ROE, whereas the remaining 46.5% and 58% of the changes in SqrtROA / ROE are impacted by other factors.

After concluding that VAIC has a positive impact on ROA and ROE as indicators of profitability in the banking sector in North Macedonia, we could now make a short analysis regarding the average value of VAIC per bank.

Table 8. **Average value of intellectual capital coefficients for 2012-2021 period**

BANK	HCE	SCE	CEE	ICE	VAIC
Stopanska banka Skopje	4.8291	0.7892	0.0434	5.6183	5.6618
Komercijalna banka	4.3940	0.7694	0.0378	5.1634	5.2012
NLB banka	4.1422	0.7505	0.0413	4.8927	4.9341
ProKredit banka	2.7673	0.6252	0.0276	3.3925	3.4201
Halk banka	2.6171	0.6083	0.0287	3.2254	3.2541
Shparkase banka	2.3599	0.5488	0.0310	2.9087	2.9397
Uni banka	2.1899	0.5229	0.0355	2.7128	2.7482
TTK banka	2.1639	0.5340	0.0437	2.6979	2.7416
Stopanska banka Bitola	1.7983	0.3951	0.0284	2.1934	2.2217
Silk Roud banka	1.3281	-0.0468	0.0270	1.2813	1.3082
TOTAL	**2.8590**	**0.5497**	**0.0344**	**3.4086**	**3.4431**

(*Source:* Authors' elaboration)

The ability of banks to produce value and the effectiveness of resource use both increase with increasing VAIC values. The VAIC indicator obtained a positive value in each of the banks that were assessed (Table 8). Also, the sector's average value is high (3.4431). It shows that Macedonian banks usually have high intellectual capacity. This indicates that for every 1 MKD invested, 3.4431 MKD in extra value are produced (Fijałkowska, 2014). From the analysis we can also notice that 3 banks have higher VAIC than the average (Stopanska banka Skopje, Komercijalna banka and NLB banka), of which Stopanska banka definitely has the highest value (5.6618), i.e., for every 1 MKD invested, an added value of 5.6618 MKD is obtained (Table 8).

The results of the paper indicate several important economic aspects. Firstly, the study confirms a statistically significant and positive relationship between the Value-Added Intellectual Coefficient (VAIC) and its components (HCE, SCE, and CEE) with the financial profitability indicators, Return on Assets (ROA) and Return on Equity (ROE), in Macedonian banks. This finding suggests that intellectual capital, as measured by VAIC, plays a crucial role in enhancing the financial performance of banks. Moreover, the research demonstrates that the components of VAIC, namely HCE, SCE, and CEE, have individual positive impacts on both ROA and ROE. This implies that efficiently utilizing human capital, structural capital, and capital employed contributes to higher profitability and returns for banks. Additionally, the study reveals that the average value of VAIC in Macedonian banks is relatively high, indicating that these banks possess significant intellectual capacity. The positive VAIC values obtained for all banks assessed further emphasize their ability to generate value and effectively utilize resources. Notably, Stopanska banka Skopje, Komercijalna banka, and NLB banka stand out with even higher VAIC values, highlighting their exceptional performance in creating additional value for each unit of investment. These economic implications highlight the importance of intellectual capital in the banking industry and emphasize the potential for banks to enhance their financial performance by effectively managing and leveraging their intellectual resources. The findings of this study can provide valuable insights for bank managers, policymakers, and stakeholders, encouraging them to prioritize investments in intellectual capital and strategies that foster its efficient utilization to drive profitability and competitiveness in the banking sector.

5. Conclusions

This paper aimed to investigate the relationship between intellectual capital and banks' financial performance in North Macedonia. To achieve this goal, linear regression models were used to analyze the relationship between intellectual capital, measured by the VAIC and its components (HCE, SCE, and CEE), and banks' financial performance, measured by ROA and ROE.

The findings of this study confirmed that the VAIC and its components have a statistically significant and positive influence on both ROA and ROE, supporting the two set hypotheses. More specifically, in relation to ROA, the results showed that both VAIC and all three of its components have a positive significant effect, while in relation to ROE, VAIC, HCE and CEE have a positive significant influence and SCE does not have a statistically significant influence.

A brief examination of the 10-year average VAIC values was also conducted, and it revealed that the average value for the sector is high (3.4431). That demonstrates the high level of intelligence often displayed by Macedonian banks. According to this, 3.4431 MKD more value is created for every 1 MKD spent. From the data, we are able to identify that three banks (Stopanska banka Skopje, Komercijalna banka, and NLB banka) had higher VAIC values than the average, with Stopanska banka having the highest value (5.6618).

The results of this study have significant ramifications for investors, legislators, and bank management. To improve their banks' financial performance, bank managers should concentrate on creating and managing intellectual capital. The results of this study might be used by policymakers to create regulations that support the creation and management of intellectual capital in the banking industry. The results of this study might help investors make wise investing choices. This study is unique in that it is the first of its kind in North Macedonia to look at the connection between intellectual capital and financial performance of banks. This study offers insightful information on the value of intellectual capital in North Macedonia's banking industry and how it could affect banks' financial performance. The results of this study add to the body of knowledge by clarifying the connection between intellectual property and financial performance in the banking sector.

Nonetheless, there are certain shortcomings in this study that have to be addressed in follow-up investigations. First off, as this study solely considers the banking sector in North Macedonia, its conclusions might not apply to other sectors or nations. Second, the study only takes into account the quantitative dimensions of intellectual capital and employs a quantitative methodology.

To develop a more thorough knowledge of the connection between intellectual capital and financial success, future study may adopt a mixed-method approach. Lastly, because just a 10-year timeframe was taken into account for the study, the results might not accurately represent the long-term link between intellectual capital and financial performance. Several recommendations for more study are made in light of the constraints already addressed. Future research may compare the relationships between financial success and intellectual capital across various businesses and nations. To learn more in-depth about intellectual capital, its components, and how they affect financial performance, qualitative research might be carried out. Future research may also go further back in time to better understand the long-term connection between intellectual capital and financial performance.

References

Ahangar, R.G. (2011) The relationship between intellectual capital and financial performance: An empirical investigation in an Iranian company, *African Journal of Business Management*, vol. 5, no. 1: 88-95, https://doi.org/10.5897/AJBM10.712

Al-Musali, M.A.K. & Ismail, K.N.I.K. (2014) Intellectual capital and its effect on financial performance of banks: Evidence from Saudi Arabia, *Procedia-Social and Behavioral Sciences*, vol. 164: 201-207

Anik, S., Chariri, A. & Isgiyarta, J. (2021) The effect of intellectual capital and good corporate governance on financial performance and corporate value: A case study in Indonesia, *The Journal of Asian Finance, Economics and Business*, vol. 8, no. 4: 391-402, doi:10.13106/jafeb.2021.0391

Appuhami, B.R. (2007) The impact of intellectual capital on investors' capital gains on shares: An empirical investigation of Thai banking, finance and insurance sector, *International Management Review*, vol. 3, no. 2: 14-25

Berry, W.D. & Feldman, S. (1985) *Multiple Regression in Practice. Sage University Paper Series on Quantitative Applications in the Social Sciences*, series no. 07-050. Newbury Park, CA: Sage.

Bontis, N. (1998) Intellectual Capital; an Exploratory Study That Develops Measures and Models, *Management Decision*, vol. 36, no. 2: 63-76, http://dx.doi.org/10.1108/00251749810204142

Bontis, N., Dragonetti, N.C., Jacobsen, K., & Roos, G. (2001) Assessing knowledge assets: A review of the models used to measure intellectual capital, *International Journal of Management Reviews*, vol. 3, no. 1: 41-60

Buallay, A., Hamdan, A.M., Reyad, S., Badawi, S., & Madbouly, A. (2020) The efficiency of GCC banks: the role of intellectual capital, *European Business Review*, vol. 32, no. 3: 383-404, https://doi.org/10.1108/EBR-04-2019-0053

Chu, S.K.W., Chan, K.H. & Wu, W.Y. (2011) Charting intellectual capital performance of the gateway to China, *Journal of Intellectual Capital*, vol. 12, no. 2: 249-276

Daoud I.J. (2017) Multicollinearity and Regression Analysis, *Journal of Physics: Conference Series*, vol. 949: 012009

Edvinsson, L. & Malone, M. (1997) *Intellectual Capital*, New York: Harper Business

Fijałkowska, J. (2014) Value Added Intellectual Coefficient (VAIC™) as a tool of performance measurement, *Przedsiębiorczość i Zarządzanie (Entrepreneurship and Management),* vol. 15, no. 1: 129-140

Firer, S. and Williams, S.M. (2003) Intellectual capital and traditional measures of corporate performance, *Journal of Intellectual Capital*, vol. 4, no. 3: 348-360

Forte, W., Matonti, G., & Nicola, G. (2019) The impact of intellectual capital on firms' financial performance and market value: Empirical evidence from Italian listed firms, *African Journal of Business Management*, vol. 13, no. 5: 147-159, https://doi.org/10.5897/AJBM2018.8725

Getis, A. (2007) Reflections on spatial autocorrelation, *Regional Science an Urban Economics*, vol. 37, no. 4: 491-496

Harel, O. (2009) The estimation of R 2 and adjusted R 2 in incomplete data sets using multiple imputation, *Journal of Applied Statistics*, vol. 36, no. 10: 1109-1118

Haris, M., Yao, H., Tariq, G., Malik, A., & Javaid, H.M. (2019) Intellectual capital performance and profitability of banks: Evidence from Pakistan, *Journal of Risk and Financial Management*, vol. 12, no. 2: 56, https://doi.org/10.3390/jrfm12020056

Ivanovic, T., Maksimovic, G., Mandaric, M., Radivojevic, N., & Jovic, M. (2021) The impact of intellectual capital on the financial performance of agricultural enterprises: Evidence from the West Balkans Countries, *Custos Agronegocio Line*, vol. 17, no. 2: 350-376

Joshi, M., Cahill, D., Sidhu, J., & Kansal, M. (2013) Intellectual capital and financial performance: An evaluation of the Australian financial sector, *Journal of Intellectual Capital*, vol. 14, no. 2: 264-285, https://doi.org/10.1108/14691931311323887

Kaplan, R. S., & Norton, D.P. (1996) *The balanced scorecard: Translating strategy into action*. Boston. Harvard Business Press

Ku Ismail, K.N.I., & Karem, M.A. (2011) Intellectual Capital and the Financial Performance of Banks in Bahrain, *Journal of Business Management and Accounting*, vol. 1, no. 1: 63–77, available on-line at https://e-journal.uum.edu.my/index.php/jbma/article/view/6794

Laing, G., Dunn, J. and Hughes-Lucas, S. (2010) Applying the VAIC model to Australian hotels, *Journal of Intellectual Capital*, vol. 11, no. 3: 269-283

Maditinos, D., Chatzoudes, D., Tsairidis, C., & Theriou, G. (2011) The impact of intellectual capital on firms' market value and financial performance, *Journal of Intellectual Capital*, vol. 12, no. 1: 132-151, https://doi.org/10.1108/14691931111097944

Mohammad, S.H., Bujang, I., & Naharu, N. (2018) Measuring Intellectual Capital using VAIC Calculator, *International Journal of Academic Research in Business and Social Sciences*, vol. 8, no. 9: 485-492, http://dx.doi.org/10.6007/IJARBSS/v8-i9/4607

Mondal, A. and Ghosh, S.K. (2012). Intellectual capital and financial performance of Indian banks. *Journal of Intellectual Capital*, vol. 13, no. 4: 515-530, https://doi.org/10.1108/14691931211276115

Nawaz, T., & Haniffa, R. (2017) Determinants of financial performance of Islamic banks: An intellectual capital perspective, *Journal of Islamic Accounting and Business Research*, vol. 8, no. 2: 130-142, https://doi.org/10.1108/JIABR-06-2016-0071

Neves, E., & Proença, C. (2021) Intellectual capital and financial performance: evidence from Portuguese banks, *International Journal of Learning and Intellectual Capital*, vol. 18, no. 1: 93-108

Nimtrakoon, S. (2015) The relationship between intellectual capital, firms' market value and financial performance: Empirical evidence from the Asean, *Journal of Intellectual Capital*, vol. 16, no. 3: 587-618

O'Brien, R.M. (2007) A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity*, vol. 41: 673-690

Osborne, J. (2002) Notes on the use of data transformations, *Practical assessment, research, and evaluation*, vol. 8: 6, https://doi.org/10.7275/4vng-5608

Osborne, J.W. & Waters, E. (2002). Four assumptions of multiple regression that researchers should always test, *Practical Assessment, Research, and Evaluation*, vol. 8: 2, https://doi.org/10.7275/r222-hv23

Ozkan, N., Cakan, S., & Kayacan, M. (2017) Intellectual capital and financial performance: A study of the Turkish Banking Sector, *Borsa Istanbul Review*, vol. 17, no. 3: 190-198

Paunović, M. (2021) The impact of human capital on financial performance of entrepreneurial firms in Serbia. Management: *Journal of Sustainable Business and Management Solutions in Emerging Economies*, vol. 26, no. 2: 29-46, https://doi.org/10.7595/management.fon.2020.0010

Pulic, A. (1998) Pulic, A. (1998). Measuring the Performance of Intellectual Potential (IP) in Knowledge Economy. In C. Tiffany, & S. Jennifer (Eds.), 19th Annual National Business Conference. DeGroote School of Business, available on-line at https://www.bib.irb.hr/35384.

Soewarno, N., & Tjahjadi, B. (2020) Measures that matter: An empirical investigation of intellectual capital and financial performance of banking firms in Indonesia, *Journal of*

Intellectual Capital, vol. 21, no. 6: 1085-1106, https://doi.org/10.1108/JIC-09-2019-0225

Steiger, J.H. (2004) Beyond the F Test: Effect Size Confidence Intervals and Tests of Close Fit in the Analysis of Variance and Contrast Analysis, *Psychological Methods*, vol. 9, no. 2: 164-182, https://doi.org/10.1037/1082-989X.9.2.164

Sveiby, K.E. (1997) *The new organizational wealth: Managing and measuring knowledge-based assets*. Berrett-Koehler Publishers

Tabachnick, B.G., & Fidell, L.S. (2001) *Using Multivariate Statistics* (4th ed.). Needham Heights, MA: Allyn and Bacon

Tillman, J.A. (1975) The power of the Durbin-Watson test. *Econometrica: Journal of the Econometric Society*, vol. 43, no. 5-6: 959-974

Tranmer, M., Murphy, J., Elliot, M. & Pampaka, M., (2020) *Multiple Linear Regression*. 2nd ed. Manchester: Cathie Marsh Institute

Xu, J., Haris, M., & Irfan, M. (2022) The impact of intellectual capital on bank profitability during COVID-19: A comparison with China and Pakistan. *Complexity*, vol. 2022: 112519, https://doi.org/10.1155/2022/2112519

The Role of Media Coverage in Initial Public Offerings: A Literature Review

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Abstract. *This comprehensive review examines the role of media in Initial Public Offerings (IPOs) and its impact on various aspects of the IPO process. The review synthesizes existing literature to analyze the influence of media coverage on IPO pricing, investor behavior, underwriters' decisions, and post-IPO performance. Media outlets, including traditional news sources and online platforms, play a crucial role in disseminating information about IPOs, providing investors with valuable insights, expert opinions, and market trends. Media coverage shapes investor perceptions, influences market sentiment, and impacts the demand for IPO shares. It also plays a significant role in underwriters' decision-making, helping them gauge investor demand and make informed pricing and allocation decisions. Media coverage can lead to herding behavior among investors, driven by media agenda-setting, information cascades, and the rise of social media platforms. The review also discusses the ethical considerations surrounding media influence in IPOs and emphasizes the need for further research to explore the impact of different media channels, market conditions, and cultural contexts on the IPO process. Understanding the dynamics between media, market participants, and IPO outcomes is crucial for market participants, regulators, and researchers to make informed decisions and ensure fair and transparent practices in the IPO market.*

Keywords: *Review; Initial Public Offering; media coverage.*

1. Introduction

The process of taking a company public through an Initial Public Offering (IPO) is a significant milestone that entails numerous complexities and uncertainties (Yalcin and Ünlü, 2018; Bhardwaj and Imam, 2019; Mumi *et al.*, 2019). As companies transition from private to public ownership, the success of an IPO is contingent upon various factors, including market conditions, investor sentiment, and pricing decisions. In this context, media coverage has emerged as a prominent and influential factor that can significantly shape the outcome of an IPO (Liu *et al.*, 2014; Bajo and Raimondo, 2017).

Media outlets, including traditional news sources, financial publications, and online platforms, play a crucial role in disseminating information about IPOs to a wide audience (Bhardwaj and Imam, 2019). They serve as a primary source of news and analysis for investors, providing them with valuable insights, expert opinions, and market trends. Media coverage can shape investor perceptions, influence market sentiment, and impact the overall demand for IPO shares (Aussenegg *et al.*, 2006; Bhardwaj and Imam, 2019).

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The influence of media on IPOs is particularly pronounced during the primary market phase, where the offering price is determined and investor interest is solicited. Media coverage contributes to the pricing dynamics of IPOs by shaping market expectations, disseminating information about the company's prospects, and influencing investor sentiment (Benveniste and Busaba, 1997). The way in which media outlets present and frame information about an IPO can impact investor perception of the company's value, growth potential, and risk factors (Bajo and Raimondo, 2017).

Furthermore, media coverage can also impact investor behavior and decision-making during the IPO process. Investors rely on media sources to gather information, assess the potential risks and rewards associated with investing in newly public companies, and make informed investment decisions. Positive or negative media sentiment can generate investor attention, impact demand for IPO shares, and contribute to herding behavior among investors (Colaco *et al.*, 2017). In addition to influencing investor behavior, media coverage also plays a significant role in shaping underwriter's decisions (Li *et al.*, 2021). Underwriters, who are responsible for pricing the IPO and allocating shares, rely on media coverage to gauge investor demand, market sentiment, and information about the company (Lundmark *et al.*, 2017). Media networks and relationships with institutional investors can provide underwriters with valuable insights, helping them to accurately price IPOs and make informed allocation decisions (Chuluun, 2015). However, the influence of media on underwriter decisions must be carefully balanced to ensure fair and transparent practices (Lowry *et al.*, 2017; Yan *et al.*, 2023).

Furthermore, media coverage extends beyond the IPO process itself and continues to influence post-IPO performance. Positive or negative media attention following an IPO can impact a company's stock price, trading volume, and market reputation. Media coverage during the post-IPO period can also shape investor perception of the company's long-term prospects, influencing its ability to attract future investments and secure strategic partnerships (Chemmanur, Hu, and Huang, 2010).

Given the significant influence of media on IPOs, understanding the dynamics between media, market participants, and IPO outcomes is of paramount importance. This comprehensive review aims to synthesize existing literature on the role of media in IPOs, examining its impact on IPO pricing, investor behavior, underwriters' decisions, and post-IPO performance. By shedding light on the multifaceted relationship between media and IPOs, this review seeks to provide insights for market participants, regulators, and researchers, and highlight the need for further investigation in this area.

The remainder of this paper proceeds as follows. Section 2 discusses the role of media as a source of information. Section 3 reviews the papers that approach the relationship between media coverage and IPO. Section 4 reviews the importance of media for Underwriter Decisions. Section 5 discusses the role of media coverage and herding behavior on IPOs. Section 6 reviews the impact of social media on IPOs. Section 7 concludes.

2. Media as a source of information

Media outlets play a crucial role in providing information to potential investors during IPOs (Bushee *et al.*, 2020). The preliminary prospectus is a key document that contains important details about the offering which is disseminated through media channels. This document serves as a primary source of information for potential investors, providing insights into the issuing firm's financials, business model, risk factors, and growth prospects (Bajo and Raimondo, 2017).

The preliminary prospectus discloses the offer price range, which represents the minimum and maximum achievable offer prices (Hanley, 1993). This range is crucial as it provides an initial indication of the firm's value and serves as a reference point for investors to evaluate the attractiveness of the IPO. It helps investors estimate the potential returns and risks associated with investing in the offering (Thompson, 2016). In addition to the preliminary prospectus, media coverage plays a significant role in disseminating information about the IPO. Media outlets publish articles, news reports, and analysis that provide additional insights into the issuing firm's fundamentals, industry analysis, competitive positioning, and growth prospects. This information goes beyond what is included in the prospectus and helps potential investors make informed decisions (Aussenegg *et al.*, 2006).

Media coverage is crucial for creating awareness and generating interest in the IPO among a broader investor audience. It helps to capture the attention of potential investors who may not have direct access to detailed financial information about the issuing firm. Media outlets, with their reach and influence, facilitate the dissemination of information to a wide range of investors, thereby increasing the IPO's visibility and potential demand (Bajo and Raimondo, 2017).

Furthermore, media coverage can influence investor perceptions and sentiments towards the IPO. Positive media coverage highlighting the firm's strengths, growth potential, and market prospects can create a favorable perception of the IPO and attract more investors. Conversely, negative or critical coverage can raise concerns and deter potential investors from participating (Aussenegg *et al.*, 2006).

In summary, media plays a critical role as a source of information in IPOs (Bushee *et al.*, 2020). It disseminates the preliminary prospectus, including the offer price range, and provides additional insights into the issuing firm's fundamentals, growth prospects, and industry analysis. Media coverage increases awareness, shapes investor perceptions, and attracts potential investors, thereby contributing to the success of the IPO.

3. Media coverage and IPO pricing

Researchers have extensively studied the relationship between media coverage and IPO pricing dynamics to understand how media influences the pricing decisions made by underwriters and the subsequent market performance of IPOs. Media outlets have the power to frame IPOs in positive or negative terms, shaping investor perceptions and influencing pricing dynamics. Studies have found that positive media coverage tends to result in higher demand and increased underpricing, as it generates more favorable market sentiment (Loughran and Ritter, 2002; Baker and Wurgler, 2007; Bajo and Raimondo, 2017; Mumi *et al.*, 2019). Conversely, negative media coverage can lead to lower underpricing (Hanley and Hoberg, 2010). The framing effect of media coverage highlights the importance of media narratives in shaping investor's expectations and IPO pricing outcomes.

3.1. Information dissemination and pricing efficiency

Media coverage plays a critical role in disseminating information about IPOs to a broad range of investors, including institutional investors, retail investors, and other market participants (Narasimhan and Wu, 2013; Bajo and Raimondo, 2017; Zou *et al.*, 2020; Gupta *et al.*, 2022). The media acts as an important intermediary, collecting and analyzing information about the issuing firm, industry trends, and market conditions, and subsequently disseminating it to the public (Bhattacharya *et al.*, 2010). Effective information dissemination is crucial for pricing efficiency in IPOs. When accurate and timely information is readily available to investors, it enables them to make informed investment decisions. It reduces information asymmetry between issuers and potential investors, which is particularly important in IPOs due to the limited historical financial data and the unique characteristics of the issuing firm (Stiglitz, 2000; Kothari *et al.*, 2009; Bhardwaj and Imam, 2019; Bushee *et al.*, 2020; Chen *et al.*, 2020).

Media coverage enhances the transparency of IPOs by providing investors with valuable insights into the fundamental aspects of the issuing firm. It allows investors to evaluate the growth potential, competitive positioning, management team, and other critical factors influencing the firm's prospects. As a result, media coverage improves the overall quality of information available to investors, contributing to the pricing efficiency of IPOs (Bajo and Raimondo, 2017).

In addition to disseminating fundamental information about the issuing firm, media coverage also facilitates the flow of information regarding market conditions and investor sentiment. Investors rely on media reports to indicate the overall market sentiment, assess the demand for IPO shares, and make judgments about the potential success of the offering. This information helps investors to mold expectations and make pricing decisions. By providing a platform for expert opinions, interviews with company executives, and analysis of industry trends, the media offers valuable insights that can shape investor perceptions and influence their pricing decisions. Media coverage acts as a conduit for information, allowing investors to gain a better understanding of the IPO and make more informed assessments of its value. The availability of accurate and timely information through media channels reduces uncertainty and improves pricing efficiency in IPOs. It allows investors to assess the risks and rewards associated with the IPO, leading to more accurate valuations (Chen *et al.*, 2020). This, in turn, helps underwriters in setting an appropriate offer price that reflects the true value of the issuing firm.

The availability of accurate and timely information is essential for pricing efficiency in IPOs (Benveniste *et al.*, 2002; Liu *et al.*, 2014; Dhamija and Arora, 2017; Chen *et al.*, 2020). According to Benveniste *et al.* (2002), media coverage enhances the transparency of IPOs by providing investors with valuable insights into the issuing firm's fundamentals, industry trends, and market conditions. This increased transparency leads to improved price efficiency as investors can better assess the value and risks associated with the IPO shares.

3.2.Media sentiment and IPO pricing

Media sentiment, reflected in the tone and content of media coverage, can significantly influence IPOs pricing decisions. Positive media sentiment creates a favorable perception of the IPO, generating enthusiasm and demand among potential investors. Conversely, negative media sentiment can cast doubts and raise concerns, leading to a decrease in investor confidence and demand (Loughran and Ritter, 2002; Baker and Wurgler, 2007; Loughran and McDonald, 2011; Mumi *et al.*, 2019). Subsequently, Media coverage contributes to the phenomenon of IPO underpricing, where the offer price is set lower than the first-day market price, resulting in significant initial returns for investors. Media attention generated through extensive coverage and positive sentiment can create a hype and increase demand for the IPO shares, leading to higher first-day trading prices (Ritter, 1984).

Studies have shown that media attention, proxied by variables such as the number of news articles or media mentions, positively correlates with IPO underpricing (Bradley *et al.*, 2001; Zhang *et al.*, 2011). The heightened media attention attracts more investors, including retail investors, who are willing to pay higher prices in the aftermarket, driving up the initial returns.

3.3. Media bias and IPO pricing efficiency

Media bias refers to the systematic and consistent deviation of media coverage from an objective or neutral perspective (Bignon *et al.*, 2010; Shen and You, 2015). In the context of IPOs, media bias can have implications for pricing efficiency, as it may introduce distortions and affect investor's perceptions and decisions (Ganesh *et al.*, 2021).

Media bias can manifest in various forms, including sensationalism, selective reporting, and opinionated commentary. Biased reporting can influence investor sentiment and perception of IPOs, leading to distortions in pricing efficiency (Pollock *et al.*, 2008; Yan *et al.*, 2023). For example, if media outlets predominantly focus on positive aspects of an IPO while downplaying potential risks or challenges, it may create a biased positive sentiment among investors. This can result in an overvaluation of IPO shares as investors become overly optimistic about the issuing firm's prospects, leading to a potential pricing inefficiency. Similarly, negative bias in media coverage can create a pessimistic sentiment among investors, leading to an undervaluation of IPO shares. This can occur if media outlets disproportionately emphasize negative aspects or highlight challenges faced by the issuing firm, potentially deterring investors from participating in the offering.

Media bias can influence investor decisions by shaping their perception of IPOs and altering their risk assessments. Biased reporting can introduce cognitive biases, such as confirmation bias, where investors selectively interpret information that aligns with their pre-existing beliefs or preferences (Shen and You, 2015). Investors may rely on media coverage as a source of information to form their opinions about an IPO. Biased reporting can reinforce existing biases and lead to suboptimal pricing decisions. For example, if media outlets consistently favor certain types of IPOs or industries, it may result in herding behavior among investors, leading to inflated or deflated prices.

While media bias can potentially impact IPO pricing efficiency, several mitigating factors should be considered. First, the presence of multiple media outlets with diverse perspectives can help mitigate the impact of bias (Boulton *et al.*, 2021). Investors can access a range of information sources and form their own judgments based on a variety of viewpoints. Second, regulatory frameworks and guidelines can promote fair and unbiased reporting. Regulatory bodies may enforce transparency requirements, disclosure standards, and guidelines for responsible journalism, reducing the potential for biased reporting and promoting a more accurate and informative media landscape. Finally, investor sophistication and information asymmetry mitigation strategies, such as conducting thorough due diligence and relying on multiple sources of information, can help investors critically evaluate media coverage and make more informed pricing decisions (Chen *et al.*, 2020).

Overall, media coverage plays a vital role in disseminating information, improving transparency, and enhancing the pricing efficiency of IPOs. By providing investors with access to relevant information, media coverage contributes to a more informed and efficient IPO market.

4. Media and underwriter decisions

The media plays a crucial role in shaping underwriter decisions in the context of initial public offerings (IPOs). Underwriters rely on media coverage to gather information, measure investor sentiment, and make informed decisions throughout the IPO process (Chen *et al.*, 2002). The media's influence on underwriters can be observed in several aspects.

4.1. Information gathering

Underwriters actively seek information from various sources to assess the prospects and market demand for an IPO. Media coverage serves as a valuable source of information for underwriters, providing insights into market trends, industry analysis, and investor sentiment.

Media reports often highlight the key characteristics of an IPO, such as the issuing company's business model, competitive landscape, growth potential, and risks. Underwriters use this information to evaluate the attractiveness of the IPO and determine the appropriate pricing and allocation strategies (Gao *et al.*, 2020).

4.2. Market sentiment and demand assessment:

Media coverage influences underwriters' perception of market sentiment and demand for an IPO. Positive media coverage can create a favorable perception of the IPO among potential investors and generate interest in the offering. Conversely, negative or critical media coverage can raise concerns and impact underwriters' assessment of market demand.
Underwriters consider media sentiment as one of the factors in gauging investor interest and demand during the book building process. They analyze media reports, investor reactions, and overall market sentiment to adjust the offering price, size, and allocation strategy accordingly (Fuellhart and Glasmeier, 2003).

4.3. Reputation and image management

Media coverage also affects the reputation and image of underwriters (Chen *et al.*, 2002). Positive media portrayals of underwriters can enhance their credibility and reputation in the market. This can lead to increased investor trust and preference for IPOs underwritten by reputable institutions (Mahussin *et al.*, 2018).

Underwriters strive to maintain positive relationships with the media, as favorable coverage can attract more issuers, increase market visibility, and potentially lead to future business opportunities. On the other hand, negative media attention or controversies surrounding underwriters can damage their reputation and affect their ability to attract quality issuers (Pollock and Rindova, 2003).

4.4. Media influence on IPO pricing and allocation

Media coverage can indirectly influence IPO pricing and allocation decisions (Stiglitz, 2000; Kothari *et al.*, 2009; Guldiken *et al.*, 2017). Underwriters consider media sentiment, investor reactions, and market expectations when setting the offer price range and determining the final IPO price.

Positive media coverage that generates significant investor interest and demand may lead underwriters to increase the offer price within the initial price range. Conversely, negative media coverage or weak market sentiment may result in underwriters adjusting the offer price downwards to ensure successful completion of the IPO (Kotha *et al.*, 2001).

Underwriters also consider media coverage when allocating shares to institutional investors during the book building process. They assess the reputation and influence of potential investors based on their media presence and coverage. Media visibility and positive coverage may increase the likelihood of receiving larger allocations (Gao *et al.*, 2020).

Overall, media coverage plays a vital role in shaping underwriter decisions throughout the IPO process. Underwriters rely on media information, market sentiment, and reputation management to make informed judgments regarding IPO pricing, allocation, and overall success.

5. Media coverage, herding behavior and IPOs

Media coverage plays a crucial role in shaping investor behavior and can lead to herding behavior in financial markets. Herding behavior refers to the tendency of investors to follow the actions and decisions of others, rather than making independent judgments. The media, through its extensive coverage and dissemination of information, can influence investor perceptions and contribute to the emergence of herding behavior (Frijns and Huynh, 2018). The following discussion provides a comprehensive analysis of the relationship between media coverage and herding behavior:

5.1.Media agenda setting and herding behavior

The media’s selection and emphasis on specific news can influence the attention and focus of investors, potentially leading to herding behavior. When the media highlights certain stocks, sectors, or market trends, investors may perceive them as important and follow the prevailing sentiment, resulting in herding behavior (Luo, Ma, and Zhao, 2020). The media’s agenda-setting power shapes investor perceptions and can trigger a "follow-the-crowd" mentality. A study by Hong, Kubik, and Stein (2004) provides evidence of media-induced herding behavior. They find that media coverage affects trading patterns and leads to herding among investors, particularly in stocks with high media coverage.

5.2. Media coverage and information cascades

Media coverage can contribute to the formation of information cascades, where investors rely on the actions of others rather than private information. For example, positive media coverage can trigger a cascade of positive opinions and actions, leading to herding behavior (Bikhchandani, Hirshleifer, and Welch, 1992). The media acts as an important source of information for investors, guiding their decisions and potentially amplifying herding behavior. Studies on the Chinese markets also highlight the impact of media coverage on information cascades and herding behavior. Zhang, Zhou, and Zhu (2020) find that media coverage has a significant influence on herding behavior in the Chinese stock market, with positive media coverage leading to stronger herding effects. This suggests that media-driven information cascades contribute to herding behavior among Chinese investors.

5.3. Social media and herding behavior

The advent of social media platforms has further amplified the role of media in shaping herding behavior. Social media platforms provide a place for rapid dissemination of information and opinions. News and recommendations shared through social media can create a sense of urgency and influence investor decisions, potentially leading to herding behavior (Barron *et al.*, 2019). Recent studies have explored the influence of social media on herding behavior. Wang, Zhang, and Zhao (2021) find that social media sentiment significantly affects herding behavior in the Chinese stock market. Positive sentiment expressed on social media platforms can induce herding behavior among individual investors.

In summary, media coverage plays a significant role in shaping herding behavior in financial markets. The media's agenda-setting power, sentiment expressed in news articles, influence on information cascades, and the rise of social media platforms all contribute to the relationship between media coverage and herding behavior.

6. Social media and IPOs

By leveraging the power of social media platforms, companies have the opportunity to enhance their communication with potential investors and engage in interactive discussions. Furthermore, social media platforms serve as a breeding ground for investor sentiment, influencing market dynamics and shaping the perception of IPOs. Through the democratization of information and increased retail investor participation, social media has the potential to transform the IPO landscape. Additionally, the impact of social media on IPO pricing efficiency and post-IPO performance raises important implications for market participants, regulators, and policymakers. Social media platforms have emerged as powerful tools for disseminating information about IPOs to a wide range of investors. Through social media, companies can directly communicate with potential investors, share IPO-related news and updates, and generate buzz around the offering (Lin, Ma, and Zhang, 2020). This democratization of information enables companies to reach a broader audience and engage with investors on a more personal level.

Social media provides a platform for investors to express their opinions and sentiments about IPOs. The collective sentiment expressed on social media can influence investor perceptions and decision-making (Li, Lu, and Wang, 2021). Positive sentiment expressed on social media can generate enthusiasm and interest among investors, potentially leading to higher demand for IPO shares.

These tools have facilitated greater retail investor participation in IPOs. Retail investors, who may have limited access to traditional IPO allocation channels, can use social media platforms to gather information, discuss investment opportunities, and potentially participate in IPOs (Lin, Ma, and Zhang, 2020). This increased flow of information can potentially lead to more efficient pricing of IPOs, as market participants incorporate a broader range of perspectives and insights (Antweiler and Frank, 2004).

In summary, social media platforms have become influential channels for IPO information dissemination, investor sentiment expression, retail investors participation, pricing efficiency, and post-IPO performance. The studies cited above highlight the various ways in which social media influences IPO dynamics and emphasize the importance of considering social media in understanding IPO-related phenomena

7. Conclusion

The role of media in IPOs has been widely studied, but there are still several areas that warrant further exploration. One important avenue for future research is to continue to investigate the impact of different media channels, including social media platforms, on IPO pricing and investor behavior. With the rise of social media, it has become increasingly important to understand how information disseminated through these channels affects investor perceptions and decision-making in the IPO market.

Moreover, examining the role of media in different market conditions, regulatory environments, and cultural contexts can provide valuable insights. IPO markets vary across different countries and regions, and understanding how media coverage and influence differ in these contexts can help in developing a more comprehensive understanding of the IPO process. Cultural factors and regulatory frameworks may shape the way media operates and influences investor behavior, and exploring these nuances can shed light on the dynamics at play.

Furthermore, it is crucial to consider the ethical considerations surrounding media influence in the IPO market. Media outlets have the power to shape investor perceptions and affect market outcomes. It is important to examine whether media coverage is unbiased and transparent or if there are potential conflicts of interest that may compromise the integrity of the IPO process. Understanding the ethical implications of media influence can guide policymakers and regulators in developing guidelines and regulations that ensure fair practices and protect investors’ interests.

Overall, future research on the role of media in IPOs should continue to explore the impact of different media channels, investigate the role of media in various market conditions and cultural contexts, and address the ethical considerations surrounding media influence.

References

Aussenegg, W., Pichler, P., & Stomper, A. (2006), IPO pricing with bookbuilding and a when-issued market, *Journal of Financial and Quantitative Analysis*, vol. 41, no. 4: 829-862

Bajo, E., & Raimondo, C. (2017) Media sentiment and IPO underpricing, *Journal of Corporate Finance*, vol. 46: 139-153

Bhardwaj, A. & Imam, S. (2019) The tone and readability of the media during the financial crisis: evidence from pre-IPO media coverage, *International Review of Financial Analysis*, vol. 63: 40-48

Bhattacharya, U., Galpin, N., Ray, R., & Yu, X. (2009) The role of the media in the internet IPO bubble, *Journal of Financial and Quantitative Analysis*, vol. 44, no. 3: 657-682

Bhattacharya, N., Demers, E., & Joos, P. (2010) The relevance of accounting information in a stock market bubble: evidence from internet IPOs, *Journal of Business Finance & Accounting*, vol. 37, no. 3-4: 291-321

Bignon, V., & Miscio, A. (2010) Media bias in financial newspapers: evidence from early twentieth-century France, *European Review of Economic History*, vol. 14, no. 3: 383-432

Boulton, T., Francis, B. B., Shohfi, T., & Xin, D. (2021) Investor awareness or information asymmetry? Wikipedia and IPO underpricing, *Financial Review*, vol. 56, no. 3: 535-561

Bushee, B., Cedergren, M., & Michels, J. (2020) Does the media help or hurt retail investors during the IPO quiet period? *Journal of Accounting and Economics*, vol. 69, no. 1: 101261

Chen, C.R., & Mohan, N.J. (2002) Underwriter spread, underwriter reputation, and IPO underpricing: A simultaneous equation analysis, *Journal of Business Finance & Accounting*, vol. 29, no. 3-4: 521-540

Chen, Y., Goyal, A., Veeraraghavan, M., & Zolotoy, L. (2020) Media coverage and IPO pricing around the world, *Journal of Financial and Quantitative Analysis*, vol. 55, no. 5: 1515-1553

Colaco, H.M., De Cesari, A., & Hegde, S.P. (2017) Retail investor attention and IPO valuation, *European Financial Management*, vol. 23, no. 4: 691-727

Dhamija, S., & Arora, R. K. (2017) Initial and after-market performance of SME IPOs in India, *Global Business Review*, vol. 18, no. 6: 1536-1551

Frijns, B., & Huynh, T.D. (2018) Herding in analysts' recommendations: The role of media, *Journal of Banking & Finance*, vol. 91: 1-18

Fuellhart, K.G., & Glasmeier, A.K. (2003) Acquisition, assessment and use of business information by small-and medium-sized businesses: a demand perspective, *Entrepreneurship & Regional Development*, vol. 15, no. 3: 229-252

Gao, H., Wang, J., Wang, Y., Wu, C., & Dong, X. (2020) Media coverage and the cost of debt, *Journal of Financial and Quantitative Analysis*, vol. 55, no. 2: 429-471

Ganesh, R., Thiyagarajan, S., & Naresh, G. (2021) Appealing for investors through IPO advertisements, *Global Business and Economics Review*, vol. 25, no. 2: 133-153

Guldiken, O., Tupper, C., Nair, A., & Yu, H. (2017) The impact of media coverage on IPO stock performance, *Journal of Business Research*, vol 72: 24-32

Gupta, V., Singh, S., & Yadav, S. S. (2022) The impact of media sentiments on IPO underpricing, *Journal of Asia business studies*, vol. 16, no. 5: 786-801

Hanley, K.W. (1993) The underpricing of initial public offerings and the partial adjustment phenomenon, *Journal of financial economics*, vol. 34, no. 2: 231-250

Kotha, S., Rajgopal, S., & Rindova, V. (2001) Reputation building and performance: An empirical analysis of the top-50 pure internet firms, *European Management Journal*, vol. 19, no. 6: 571-586

Kothari, S.P., Li, X., & Short, J.E. (2009) The effect of disclosures by management, analysts, and business press on cost of capital, return volatility, and analyst forecasts: A study using content analysis, *Accounting Review*, vol. 84:1639–1670

Jang, W.Y. (2007) Media exposure or media hype: Evidence from initial public offering stocks in Taiwan, *Journal of Media Economics*, vol. 20, no. 4: 259-287

Jens, P., Brooks, R., Nicoletti, G., & Russell, R. (2006) Media coverage and biotechnology IPOs: Some Australian evidence, *Journal of Commercial Biotechnology*, vol. 13: 43-47

Jia, M., & Zhang, Z. (2014) Donating money to get money: The role of corporate philanthropy in stakeholder reactions to IPOs, *Journal of Management Studies*, vol. 51, no. 7: 1118-1152

Li, Y., Shi, H., & Zhou, Y. (2021) The influence of the media on government decisions: Evidence from IPOs in China, *Journal of Corporate Finance*, vol. 70: 102056

Liu, L. X., Sherman, A.E., & Zhang, Y. (2014) The long-run role of the media: Evidence from initial public offerings, *Management Science*, vol. 60, no. 8: 1945-1964

Lowry, M., & Schwert, G.W. (2004) Is the IPO pricing process efficient? *Journal of Financial Economics*, vol. 71, no. 1: 3-26

Lundmark, L.W., Oh, C., & Verhaal, J.C. (2017) A little Birdie told me: Social media, organizational legitimacy, and underpricing in initial public offerings, *Information Systems Frontiers*, vol. 19: 1407-1422

Mahussin, N., Mustafa, H., & Sum, R.M. (2018) Media Attention and The Role of Underwriter in Initial Public Offerings, in *Proceeding-17th Kuala Lumpur International Business, Economics, and Law Conference:* 154-165, available on-line at https://www.researchgate.net/publication/329962012_MEDIA_ATTENTION_AND_THE_ROLE_OF_UNDERWRITER_IN_INITIAL_PUBLIC_OFFERINGS

Mumi, A., Obal, M., & Yang, Y. (2019) Investigating social media as a firm's signaling strategy through an IPO, *Small Business Economics*, vol. 53: 631-645

Narasimhan, J. & Wu, D. (2013) Word power: A new approach for content analysis. Journal of Financial Economics, vol. 110, no. 3: 712–29

Pollock, T.G., & Rindova, V.P. (2003) Media legitimation effects in the market for initial public offerings, *Academy of Management journal*, vol. 46, no. 5: 631-642

Pollock, T.G., Rindova, V.P., & Maggitti, P.G. (2008) Market watch: Information and availability cascades among the media and investors in the US IPO market, *Academy of management journal*, vol. 51, no. 2: 335-358

Shen, Z., & You, J. (2015) *Driving the presence of investor sentiment: The role of media bias in IPOs* (No. 3). Working Paper, available on-line at https://www. researchgate. net/profile/Zhe_She

Silva, N., Sebastião, H., & Henriques, D. (2021) IPO Patterns in Euronext After the Global Financial Crisis of 2007-2008, *Notas Económicas*, vol. 52: 137-155

Staikouras, C., Tsatsanis, D., & Mylonakis, J. (2010) The Effect of Media Exposure and Market Psychology on IPOs Underpricing, *International Review of Applied Financial Issues and Economics*, vol. 2, no. 4: 803

Stiglitz, J.E. (2000) The contributions of the economics of information to twentieth century economics, *Quarterly Journal of Economics*, vol. 115: 1441–1478

Zou, G., Li, H., Meng, J. G., & Wu, C. (2020) Asymmetric effect of media tone on IPO underpricing and volatility, *Emerging Markets Finance and Trade*, vol. 56, no. 11: 2474-2490

Yalcin, N., & Ünlü, U. (2018). A multi-criteria performance analysis of Initial Public Offering (IPO) firms using CRITIC and VIKOR methods, *Technological and Economic development of Economy,* vol. 24, no. 2: 534-560

Yan, C., Wang, J., Wang, Z., & Chan, K. C. (2023) Do media connections help? Evidence from IPO pricing in China, *Journal of Accounting and Public Policy*, 107075, forthcoming, http://dx.doi.org/10.2139/ssrn.3953672

SECTION 7 Audit

Mapping the Scientific Landscape of Internal Audit and Risk Management: The Connectivity of Research

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Mapping the Scientific Landscape of Internal Audit and Risk Management: The Connectivity of Research

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Abstract: *Aiming to identify the intellectual structure of internal audit and risk management and the changing trends, this paper presents a comprehensive image of the research area, using bibliometric analysis technique. Observing the evolving research themes in the field until early 2023, a final dataset of 246 bibliometric records were extracted from Web of Science Core Collection database. The scientific mapping analysis over internal audit and risk management dataset is conducted by using VOS viewer software. The study combines co-citation, co-authorship and co-occurrence of the keywords in analyzing the themes evolution patterns. The results reveal that the research themes in the field are continuously developing, but the quantity of research output is yet limited for the internal audit - risk management relationship. The main attention still lies on the effectiveness, quality and improvement in both internal audit and risk management processes. There are also other directly linked concepts with the subject area, such as corporate governance or financial reporting performance. There is a need for more research in the field, focusing on the interaction between internal audit and risk management, extended with factors that might moderate this relationship.*

Keywords: *Internal audit, risk management, bibliometric analysis, science mapping, research connectivity.*

1. Introduction

Due to the early twenty-first century's context marked by high-profile bankruptcies, accounting scandals, and global financial crisis, the researchers' interest in the fields of internal audit and risk management has increased (Hazaea, 2022). Over time, internal audit has consolidated its position as a pivotal component of an efficient corporate governance by supporting management with supervision and assurance (Behrend and Eulerich, 2019). Likewise, risk management has gained considerable interest in corporate research, as global enterprises faced a multitude of challenges with the potential of impacting decision-making process (Mazumder and Hossain, 2018). In recent years, the focus moved to internal audit and risk management effectiveness (Tamimi *et al.*, 2021; Turetken *et al.*, 2019) and their improvement over time, especially within the context of crisis and post-crisis periods (Lenning and Gremyr, 2021; Kobts *et al.*, 2020).

This study contributes to the existing literature by presenting an overview on the relevant internal audit and risk management with the aim of highlighting the dynamic and the connectivity patterns in terms of research themes, authorship and research topics of scientific papers. Previous research either review the internal audit or focus

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on risk management areas. Behrend and Eulerich (2019) conducted a bibliometric analysis which investigates the internal audit evolution within accounting research. The findings show that the literature is defined by the relationship between internal audit and corporate governance, but also has a focus on the internal audit quality. Pan *et al.* (2022) and Yildirim (2022) performed bibliometric analyses on risk management themes. Pan *et al.* (2022) argue that the main research topics, related to risk management in foreign direct investment, refer to environmental protection, energy consumption, and climate change. Yildirim (2022) claims that the USA is the country with the most collaboration links and with the most cited journal (US-based Journal of Banking and Finance) in the field of banking risk management. To fill this gap, the current paper conducts a bibliometric analysis on publications that observe both internal audit and risk management themes. The study does not only exhibit what defines internal audit and risk management research, but also draws attention on the current and potential future research directions in the field.

By using a final sample of 246 bibliometric records extracted from the Web of Science database for 1990-2023 period, this paper addresses four research questions:

> RQ1. *What is the publishing trend in the field of risk management and internal audit research?*
> RQ2. *Which is the connectivity of the foundational themes in the field of risk management and internal audit?*
> RQ3. *Which are the interactions between contributing authors in the field of the risk management and internal audit research?*
> RQ4. *Which are the existing or future relationships between the research topics in the field on risk management and internal audit?*

To answer the research questions, performance analysis, based on publication trend and co-authorship, is complemented by science mapping, including co-citation and co-occurrence of keywords. The observations included in the final sample are processed with VOS viewer application.

The rest of the paper is structured as follows. In Section 2 a literature review is performed in order to gain a comprehensive picture of the most relevant articles in the field of internal audit and risk management. Section 3 outlines the design of the research and data selection method. The Results section covers a descriptive analysis on the frequency of the publications and a discussion of the findings regarding co-citation, co-authorship and keywords co-occurrence in the area of internal audit and risk management research. The final section presents the significant conclusions of the study, the limitations and potential areas of future research directions.

2. Literature review

Risk management has emerged as a significant research topic within the corporate area, as worldwide enterprises confront a large variety of risks that could impact the decision-making process (Mazumder and Hossain, 2018). In accordance with the Institute of Internal Auditors (IIA, 2023), the internal audit function has an integral role in the comprehensive framework for risk management. Moreover, internal audit plays a large role in corporate governance (Xiao, 2018; Hazaea *et al.*, 2022) and ensure the sustainability of the institutions (Hazaea *et al.*, 2022). Beside the business sustainability, the implementation of a good integrated internal audit management could positively impact the firm performance (Hassan *et al.*, 2022). In the same direction, DeSimone *et al.* (2021) claim that companies with a developed and well-defined internal audit functions and risk management program are more likely to be involved in sustainability assurance. Besides its traditional role of focusing on internal control and financial compliance, internal audit may promote good governance in organizations by taking on a larger advisory role in the area of risk management activities (Onay, 2021).

An effective and efficient internal audit improve the mechanisms on risk management in establishing the potential risks. As the efficiency of internal audit is crucial in a company's control measures of risks, many studies aimed to investigate in what manner this could impact a company's evolution. As such, the degree of success of the internal audit's contribution to an organization is closely related to its influence on the organization's risk management (Onay, 2021). Additionally, risk management has a contributory role by facilitating the identification of potential risks and specific areas for internal audit, leading to effective and efficient internal audit operations (Ardianingsih and Payamta, 2022). Weekes-Marshall (2020) examined the involvement of the internal audit in the risk management process in a developing country. The result exposes that internal audit and risk management are both in an evolving stage. Nonetheless, internal audit should embrace new technologies, such as continuous auditing, and adopt a common risk language within the organization (Onay, 2020). Kobt *et al.* (2020) argue that more studies need to observe internal audit's effectiveness on a post-crisis period.

Internal audit role in risk management has a major effect on the prevention of financial crime behaviors (Putra *et al.*, 2022). The quality of the internal audit is a significant predictor of effective risk management (Kabuye *et al.*, 2019; Islam *et al.*, 2018). The significance of internal audit's role in risk management is essential in the implementation of preventive measures against company's risks, such as fraudulent activities (Putra *et al.*, 2022; Tamini, 2021), supporting a good corporate governance practice. Hazami-Ammar (2019) argues that the more effective the risk management is, the more likely it is that internal auditors will be involved in investigating fraud risks, by studying the relationship between internal audit function and the process of investigating fraud on a sample of French companies. In order to gain a more pertinent image over risk management effectiveness, more studies need to be done on developing and underdeveloped countries and also in-depth analysis for every particular sector (Mazumder and Hossain, 2018).

Risks that lie within the cybersecurity area are often observed in many researches, for example studies conducted by Haapamaki and Sihvonen (2019) or Stafford *et al.* (2018). Haapamaki and Sihvonen (2019) claim that there is a need for more research in the field of cybersecurity risk and the role performed by internal auditors. Moreover, the internal audit practices in identifying cybersecurity risks may help organizations reduce their exposure to cyber threats and improve their overall risk management practices (Stafford *et al.*, 2018).

An interest in the performance of the internal audit's role in risk management lies with the company's stakeholders (Christopher and Sarens, 2018). Thereby, the stakeholder's attention falls on the degree of the implementation and practice of internal audit

(Hazaea *et al.*, 2022). Moreover, the stakeholders carry an essential role in identifying optimal strategies for the risk maturity' level in a company (Kiral and Karabacak, 2020), but, on the other hand, internal auditors must possess solid knowledge of risk management and risk maturity (Ardianingsih and Payamta, 2022). However, according to White *et al.* (2020), for the relationship between risk management and internal audit to be mutually beneficial, the stakeholders must develop a shared code of practice. Abdelrahim and Al-Malkawi (2022) argue that some of the most relevant factors that may impact the internal audit effectiveness is senior management support, but also the need of continuous improvement in processes, as nowadays internal audit is focusing more on compliance than on improvement (Lenning and Gremyr, 2021).

Zahaea *et al.* (2021) claim that there is more to be considered on the internal audit, as the literature has substantial gaps while the researchers still have a predominant interest on private sector rather on the public sector's activity. Nevertheless, the private sector needs as well more in-depth studies on specific areas as most of the studies are adopting holistic approaches (Mazumder and Hossain, 2018).

3. Methodology

The current study aims to contribute to a comprehensive review (Nobanee *et al.*, 2020) and to discover possible future researches in the area of internal audit and risk management research. Using bibliometric analysis, several techniques are adopted (co-citation analysis, co-authorship and co-occurrence of the keywords) as a tool for exploring the scientific mapping of research, as show in *Figure 1*.

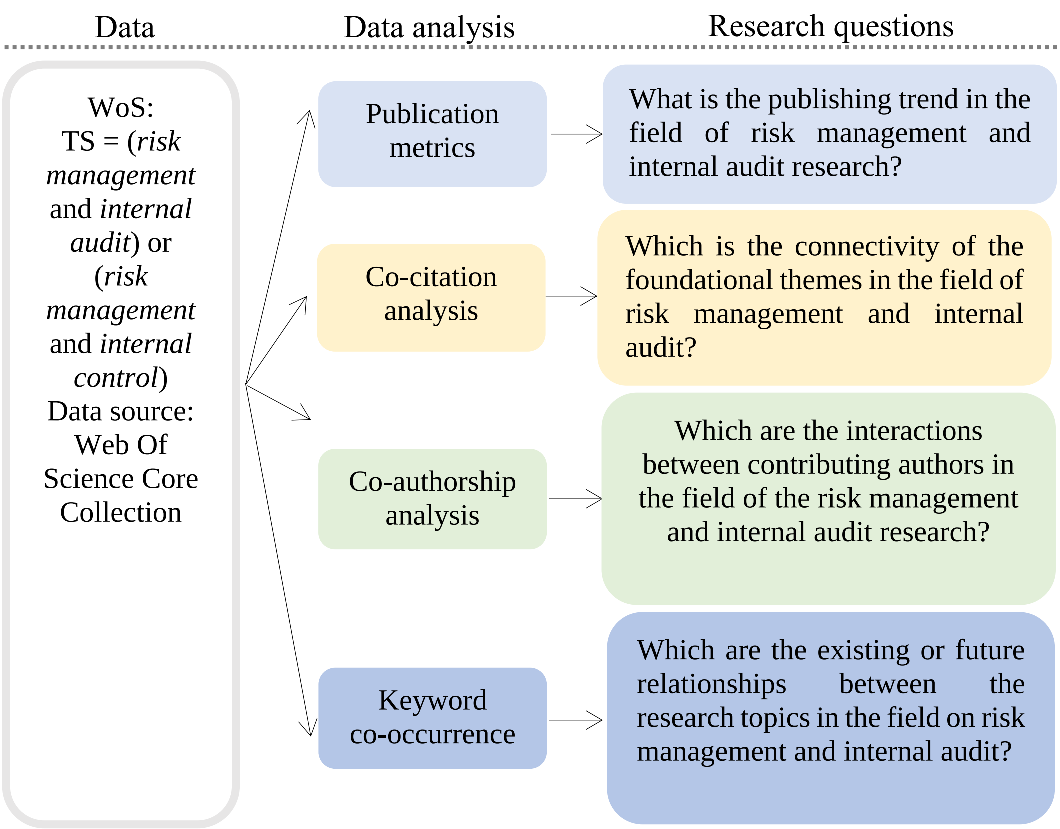

Figure 1. **Research framework**
(*Source:* Authors' projection based on Donthu *et al.*, 2021)

The bibliometric analysis is known as an effective technique (Donthu *et al.*, 2021), using a quantitative approach in synthesizing the literature on a specific domain (Behrend and Eulerich, 2018). The techniques of a bibliometric analysis have its limitations, but it is beyond the classic descriptive statistics. Moreover, a study based on a bibliometric analysis as method of research will scrutinize the specifics of the subject's scientific map and also the network structure (Pan *et al.*, 2022). Most importantly, the roughness of bibliometric analysis could break down the progressive shade of a particular field and simultaneously clarifying the rising areas in the same field (Donthu *et al.*, 2021).

The citation analysis gives a perspective on the relationships among publications and shed light on the most significant publications in the field of risk management and internal audit. Further, there is added two complementary techniques, the co-citation analysis and the bibliographic coupling. The co-citation analysis brings up the expansion of the foundational themes in our research area, by underlining the relationship among the cited publications. Moreover, by using the co-occurrence of the keywords as a tool of this current bibliometric analysis, the future and the present research topics will be revealed.

Among the commonly scientific databases that are used in running a bibliometric analysis, Web of Science (Clarivate Analytics) and Scopus (Elsevier) may be used (Nobanee *et al.*, 2021; Pan *et al.*, 2020). On this basis, the dataset for this study was extracted from Web of Science scientific database, which is the world's most trusted publisher-independent global citation database (www.clarivate.com). Since the study's subject lies on internal audit and risk management, the search criteria were set as TS = (*risk management* and *internal audit*) or TS = (*risk management* and *internal control*), since *internal control* is closely related to internal audit. A total of 417 initial bibliometric records were returned, with publication years starting from 1990 to 2023 (more specifically until 01.04.2023 – the date at when the database was last updated). Further, the research areas were limited to *Business Economics* and the data was restricted only to those articles written in English. Hence, the final database is composed of 246 bibliometric records.

4. Results

4.1. Dynamics of research on internal audit and risk management

The distribution by year, for the published articles with an interest in risk management and internal audit, indicates an enhanced attention for this research field between 1996 and the beginning of 2023, as it may be seen in *Figure 2.* It answers the RQ1. *What is the publishing trend in the field of risk management and internal audit research?* Further, specific time frames may be distinguished, that could impact the distribution of the publications.

First, the distribution of the publications indicates a growing interest in this field starting from 2002. This year could be connected with the establishing of the Sarbanes-Oxley Act (SOX) federal law, which a regulatory framework that encourage resources allocation in internal audit function. Behrend and Eulerich (2018) argue that the approval of the SOX may be the deepest regulation change in the early 21st century.

Beside this, due to the high-profile bankruptcies and the worldwide accounting scandals of the early 2000's, from Enron in the United States of America to Parmalat in Europe, the attention has turned to the role of internal audit, internal control, corporate governance and risk management (Hazaea *et al.*, 2022).

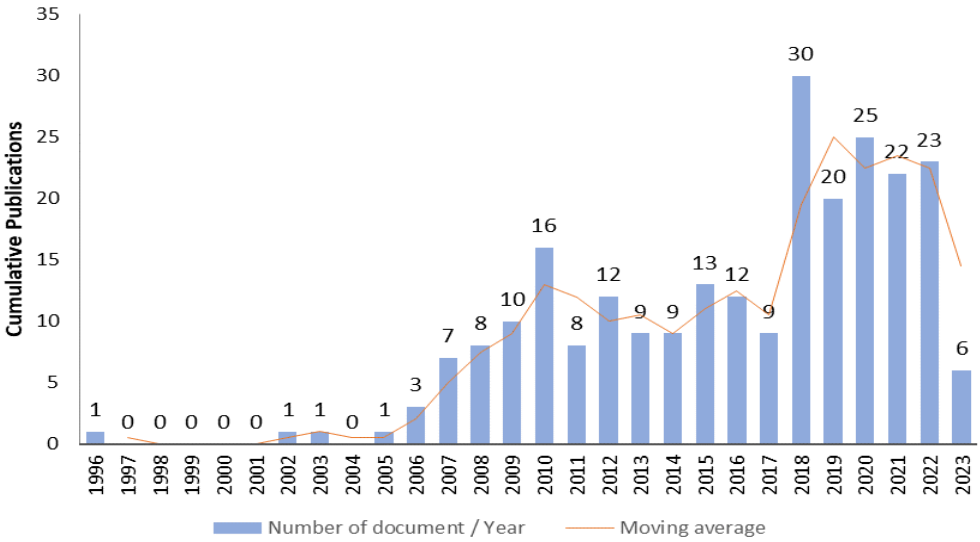

Figure 2. **Distribution of risk management and internal audit related publications in Web of Science**

The abrupt drop in risk management and internal audit publications immediately after the year 2010 may be connected with the given background of the financial crisis during 2007-2008 that shifted attention to management accounting issues (Van der Stede, 2011). The year 2018 clearly marks the peak of risk management and internal audit research in the Web of Science database with 30 publications. Starting with 2018, the increased attention of the companies lies on cyber security risks and data privacy regulations (Lois *at al*., 2019), which may impact the trend distribution of the articles. Moreover, the implementation of European Union's General Data Protection Regulation (GDPR) in 2018 brings more internal audit challenges in mitigating risks related to reputational management, ethics and compliance.

4.2. Co-citation analysis

The co-citation matrix of the current study consists of 7,878 unique references that in total were cited 9,591 times. To avoid confusion in the results, there is set the minimum number of occurrences of a citation by 2. *Figure 3* provides an overview on the co-citation network and answers RQ2. *Which is the connectivity of the foundational themes in the field of risk management and internal audit?*

Each node of *Figure 3* symbolize an article and it's noted with the author's name and publication year. The scale of the node is provided by the number of the citations of each reference. The network nodes are divided in 9 different clusters, illustrated with different colors.

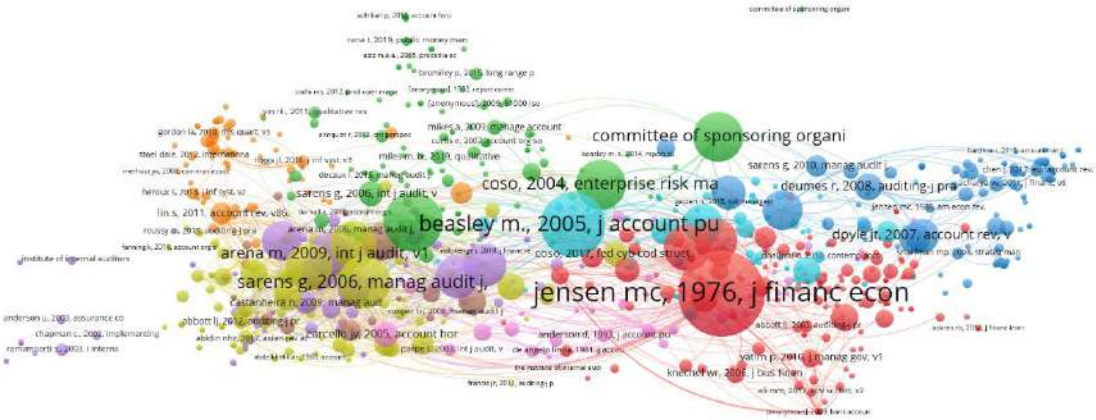

Figure 3. **Co-citation network of risk management and internal audit related publications in Web of Science**

Under the assumption that publications that are cited together are similarly thematic (Donthu *et al.*, 2021), we argue that an overview on each cluster could add more value to the current study. The node with the largest degree is represented by Jensen and Meckling (1976), which's paper presents elements of the concept of the agency theory and property rights theory under the aim of expanding a theory of a company's ownership structure. The article also explains the agency cost and provides new perspective over the definition of the company concept.

An in-depth analysis of the clusters could lead to central themes that characterize each cluster, as it is synthetized in the *Table 1*. The further discussion is limited only to the first tree largest clusters and the relevant publications, representative to their cluster. The most representative publication for each of the tree clusters are Jensen and Meckling (1976), Spira and Page (2003) and Krishnan (2005).

Table 1. **Most relevant document per cluster**

Clusters	Theme	Document	Citations	Subject matter
Cluster 1	Corporate Governance, Risk management	Jensen and Meckling (1976)	28	Developing the theory of ownership structure and defining the concept of agency cost
Cluster 2	Risk management, Internal audit and Internal control	Spira and Page (2003)	19	Exploring the changes in internal audit and risk management after the publication of Turnbull guidance
Cluster 3	Internal control and Internal audit quality	Krishnan (2005)	13	Examination of the association between audit committee quality and corporate internal control quality
Cluster 4	Internal auditors and Risk management	Sarens and De Beelde (2006)	17	Describing how internal auditors understand their role in risk management
Cluster 5	Internal audit, Corporate	Goodwin-Stewart and Kent (2006)	14	Exploring the intention of using the internal audit and identifying factors that impact

Clusters	Theme	Document	Citations	Subject matter
	Governance and Risk management			the internal audit function in listed companies
Cluster 6	Enterprise risk management	Beasley *et al.* (2005)	21	Examination of the factors related to the stage of enterprise risk management implementation
Cluster 7	Internal audit function	Lin *et al.* (2011)	7	Exploring the internal audit function role in the reporting of material weakness under Section 404 of SOX
Cluster 8	Internal audit function	Soh and Martinov-Bennie (2011)	12	Providing a vision over the role and the responsibilities of internal audit function and the factors that warrant effectiveness
Cluster 9	Corporate Governance and Audit Committee	Carcello *et al.* (2005)	8	Finding the major insights and practice implication of the corporate literature in accounting and auditing

The largest cluster presents Jensen and Meckling (1976), as the most cited reference, who develops the theory of ownership structure within a company starting from the agency theory elements. Moreover, the publication also defines the background of agency cost theory, by investigating its provenience and in which context. Included in the same cluster, Aebi *et al.* (2011) place risk management and corporate governance under the context of a financial crisis in the banking sector, arguing that the improvement of the risk management is crucial for the banks performance. Beasley *et al.* (2008) and Gordon *et al.* (2009) bring the concept of enterprise risk management in front, by focusing on the implementation level and its impact on firm performance. Hoyt and Liebenberg (2011) follow the implementation level of enterprise risk management and argued that enterprise risk management is significantly bonded to the added value in the companies. Beasley *et al.* (2009) argue that the role of the audit committee as its commitment in the companies reporting is doubtful. Subramaniam *et al.* (2009), claim that companies that present a strong collaborating between risk management committee and audit committee are efficiently managing the financial reporting risk, while the organizational complexity is notable higher.

Sarens *et al.* (2006), the most cited reference of the second largest cluster, investigate the internal auditor’s role in the risk management processes, arguing that internal auditors are playing an important role in establishing a higher level of risk and control consciousness and a more structured risk management system. COSO (1992) and COSO (2004) also set the cluster’s theme to internal audit, internal control and risk management, by defining their frameworks. Spira and Page (2002) argues that the importance of internal auditors is growing as the perception of a company’s risks may directly impact the effectiveness of risk management. The risk management efficiency may also be corelated with the implementation of enterprise risk management (COSO, 2004), whereas there is a need of using quantitative methods for risk evaluation (Paape and Spekle, 2012).

The third largest cluster lies on the aspect of the quality processes developed within internal audits and internal controls. Krishnan (2005) conducted a study based on the examination of the audit committee quality and the internal control quality and their association. The results suggest that independent and expertise audit committees are less related with the errors that might occur within the intern control process. Doyle *et al.* (2007) investigates the link between internal control and financial reporting. The material weakness faced during the internal controls may vary from a company to another, based on company's particular challenges in the process of internal control. Therefore, the impact over the financial reporting is significantly positive.

4.3. Co-authorship analysis

By co-authorship analysis, the interactions among the authors in the risk management and internal audit research are examined and the RQ3 is answered. In order to avoid ambiguity in the results and the map visualization (*Figure 4*) we limited by displaying only those networks that meet the condition of presenting the total link strength not less than 3. Therefore, we obtained 42 clusters but we limited our discussion to the first five largest clusters. As it could be seen in *Figure 4*, authors such as Nazarova, Rasli, Eulerich, Drogalas and Yang seem to appear noticeably in the network.

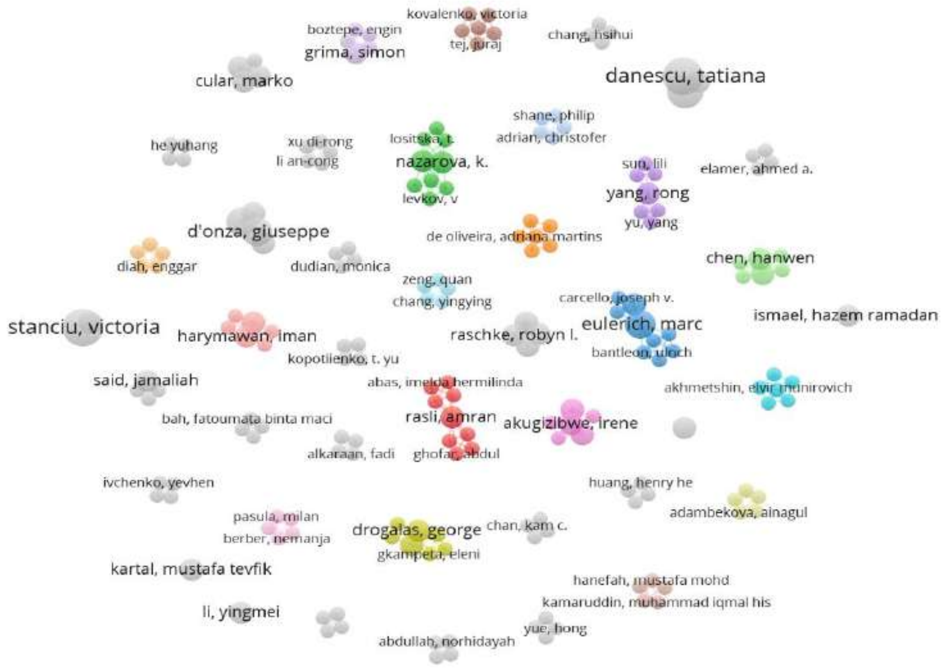

Figure 4. **Co-authorship network in the field of risk management and internal audit**

The largest cluster in the co-authorship network in the field of risk management and internal audit research is formed by 9 authors, whom collaboration lies on themes closely related to internal control and internal audit. On Rasli's authorship interaction cluster the predominant debated themes are those directly linked with corporate governance and risk management, while on Eulerich's collaborations we find a higher interest on themes strongly related to internal audit. The next significant cluster, having Drogalas as representative, includes studies closely related with the implementation and characteristics on risk-based internal audit. Another noticeable authorship interaction is between Yang and other authors, which performed studies lying on themes related to risk management and corporate governance particularities.

4.4. Co-occurrence of the keywords' analysis

To answer the fourth research question, RQ4. *Which are the existing or future relationships between the research topics in the field on risk management and internal audit?* the co-occurrence of the keywords' matrix was constructed. It consisting of 670 unique author's keywords that in total occurred 1,081 times. In order to avoid ambiguity in the results and the map visualization (*Figure 5*), the minimum number of occurrences of an author's keyword was set to 2. *Table 2* displays the most frequently used keywords occurred in the sampled database. The highest number of occurrences is given by the keywords: *risk management*, *internal control* and *internal audit*.

Table 2. **Top 10 keywords by the number of occurrences**

Keyword	Number of occurrences	Keyword	Number of occurrences
Risk management	90	Operational risk	8
Internal control	55	Governance	7
Internal audit	52	Risk	7
Corporate governance	34	Risk assessment	6
Audit committee	15	Public sector	6
Enterprise risk management	14	Compliance	5
Internal auditing	12	Internal auditor	5
Internal control system	10	Cybersecurity	5
Audit	8	COSO*	5
Internal controls	7	Auditing	4

*Note. COSO means the Committee of Sponsoring Organizations of the Treadway Commission

After running the analysis in *VOS viewer,* nine keyword clusters were generated. The analysis of keywords co-occurrence provides grouped publications by thematic relationship with one another. A comprehensive picture of the words that appear in every cluster may be seen in *Figure 5*.

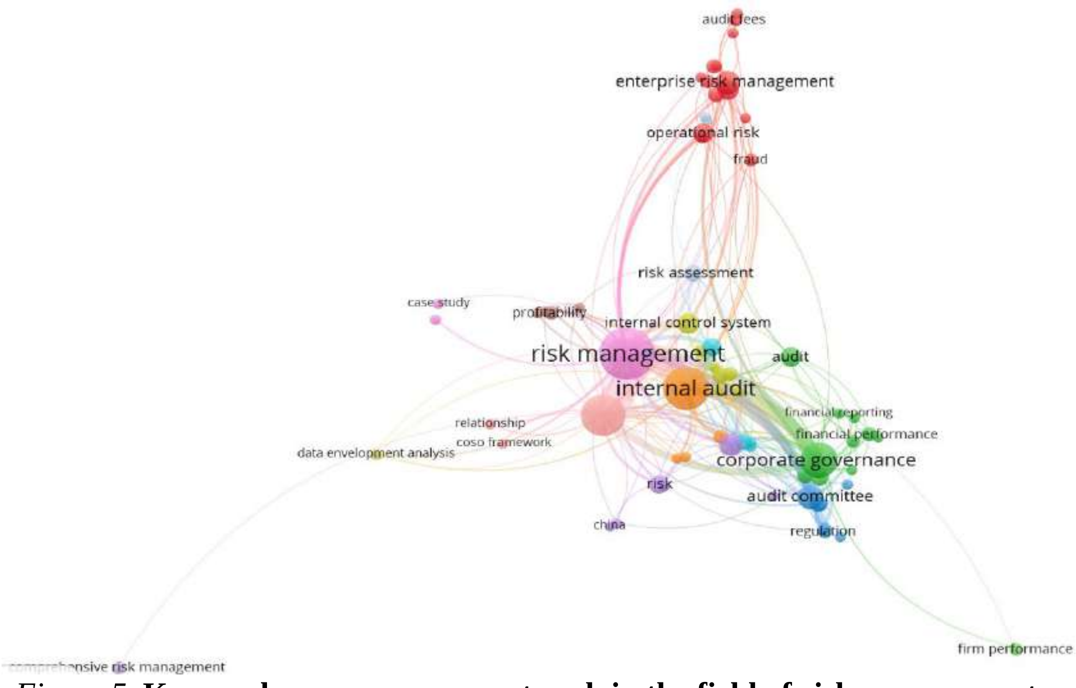

Figure 5. **Keywords co-occurrence network in the field of risk management and internal control**

Table 3 shows the most representative author's keyword for every cluster. A brief analysis of every cluster with a large node is further presented, as the size of the node is directly proportional with the number of occurrences.

Table 3. **Most representative keyword on each cluster**

Cluster	Keywords	Number of occurrences	Total link strength
Cluster 1	Risk management	90	146
Cluster 2	Internal audit	55	94
Cluster 3	Internal control	52	84
Cluster 4	Corporate governance	34	75
Cluster 5	Audit committee	15	37
Cluster 6	Enterprise risk management	14	18
Cluster 7	Internal auditing	12	27
Cluster 8	Internal control system	10	15
Cluster 9	Governance	7	22
Cluster 10	Risk assessment	6	18
Cluster 11	Firm performance	3	3
Cluster 12	Efficiency	2	7
Cluster 13	Risk identification	2	4
Cluster 14	Comprehensive risk management	2	2

Cluster 1 (pink color) is predominantly characterized by the concept of *risk management*. The node, which is also the largest in the visualization map, is located in close proximity to the center of the map, alongside the *internal audit* and *internal control* nodes. Cluster 1 is directly linked to Cluster 12 (light brown color), which comprises terms such as *efficiency* and *profitability*, as well as Cluster 13 (dark green color), which presents the main theme of risk identification. The most of the publications from our dataset are directly linked with the *risk management* keyword. Some of the most recent studies are conducted by Beuren *et al.* (2023), Castellini and Riso (2023), Fekete (2022) and Ardianingsih and Payamta (2022).

Cluster 2 (orange color) is predominantly characterized by the keyword *internal audit*. The proximity of this node to the *risk management* node is expected, given that these two concepts are the primary filters for forming our database. It should be noted that Cluster 2 also exhibits direct interactions with Cluster 8 (lime green color), which includes terms such as *internal control system*, *risks*, *compliance* and *assurance activities*. Additionally, Cluster 2 is adjacent to Cluster 7 (purple color), which presents terms such as *internal audit quality*, and Cluster 9 (light blue color), which includes concepts such as *governance*, *accountability* and *public sector*. Aligned with this clusters, studies performed by Hazarea *et al.* (2022), Klius *et al.* (2020) and Roussy *et al.* (2018) lies their themes from internal audit quality, internal control systems and risk management to other direct associate concepts.

Cluster 3 (light red color) includes articles that are based on the concept of *internal control*. This term is linked with the *COSO framework* and the concept of *relationship*. Moreover, Cluster 3 exhibits direct interactions with the *risk management* and *internal audit* clusters. Cluster 3 is also directly linked with Cluster 14 (grey), which presents concepts such as *internal control quality* and *comprehensive risk management*. From the group of the publishing that are lying under this cluster, Beuren *et al.* (2023) links the concept of internal control to risk management, while Zhang *et al.* (2022) bring the term *internal audit quality* and term *ethical standards* under the same study.

Cluster 4 (green color), highlights the concept of *corporate governance* as the dominant node of the keywords. This cluster is primarily concerned with concepts that relate to *financial reporting performance*. The most recent studies included in the sampled dataset, that align corporate governance with financial reporting performance, are conducted by Alkaraan *et al.* (2023), Velte (2022) and Jia and Bradbury (2021). Furthermore, Cluster 4 has a direct linkage with Cluster 11 (light green), which focuses on firm *performance* as main theme.

Cluster 5 (blue color) is placed around the concept of *internal audit committee* as its primary theme. The top term associated with this cluster is *audit committee*. The researchers associated with this cluster are focused on concepts that are closely related to the audit process, such as *internal audit effectiveness*, *regulation* and the *internal audit function*, which are the remaining author's keywords for this cluster. Bananuka *et al.* (2022), Hazaea *et al.* (2022), Tamini (2021) and Cular *et al.* (2020) are grouped by this cluster main theme of *internal audit*, *audit committee* and the rest of adjacent keyword with the theme.

Cluster 6 (red color) includes a group of concepts that have attracted the perpetual attention of researchers in the field of *enterprise risk management*. Within this cluster, one may encounter various interlinked concepts, including *financial reporting quality*, *internal audit function*, *internal controls*, *fraud*, *operational risk management*, *audit fees*, and the *insurance industry*. This cluster groups studies as Hassan *et al.* (2022), Ghafoor *et al.* (2022) or Onay (2020) with themes lying on the concept of *enterprise risk management*. On the other hand, Cluster 10 (grey-blue color) is closely linked to the Cluster 6, being evidenced by its component terms *risk assessment* and *bank performance*.

5. Conclusions

The study offers a perspective on the relationship between internal audit and risk management research as it provides an overview on various research themes that frequently occur within the indexed set of articles from Web of Science. The results show that the distribution of the publications indicates a growing interest in this field starting from the early twenty-first century period. The establishing of the SOX Act raised the researchers' interest in the field, as the academic trend towards publications is noticeable in the post-SOX era. As well, noticeable growing trend is also observed in contexts given by high-profile bankruptcies, accounting scandals around the world, or financial crisis.

The chosen bibliometric tools for running the study allow to observe the research themes evolution over time. The subject matters such as the effectiveness, quality and improvements in the field of internal audit and risk management (Lin *et al.*, 2011; Soh and Martinov-Bennie, 2011) are in constant development, whilst the researchers' interest in the field is still growing.

The network of contributing authors is distributed over the theme of interest. The most predominant research areas of the analyzed dataset are grouped in two major themes:

internal audit (Carcello *et al.*, 2020) and risk management (Noor *et al.*, 2022), frequently link to the concept of corporate governance. This could mean that there is a need of more studies that analyze the relationship among the mentioned concepts and that there are still uncovered areas in the field.

The co-occurrence of the author's keywords matrix allows the displaying of the most frequently used keywords in the sampled database, thereby the analysis provides grouped publications by thematic relationship with one another. One of the main themes linked to internal audit and risk management is regarding enterprise risk management implementation (Hassan *et al.*, 2022; Ghafoor *et al.*, 2022; Onay, 2020). In addition, another major concept directly linked with internal audit and risk management is corporate governance and financial reporting performance (Alkaraan *et al.*, 2023; Velte, 2022; Jia and Bradbury, 2021). The results show that the concepts terms internal audit and risk management are strongly linked among the researchers' publications, but there are still gaps to fill (Roussy and Perron, 2018).

The topic of internal audit and risk management effectiveness are debated in most of the publication. According to Turetken *et al.* (2019), internal audit is crucial in ensuring that a company's practices conform to regulations. Nevertheless, further research is required to identify the factors that influence internal audit effectiveness. Numerous studies lie their research directions within the prior crisis contexts. Hazaea *et al.* (2022) claim that more studies must be conducted in the field of the impact of current crisis period on internal audit and risk management. In such manner, the improvements of internal audit and risk management processes can be observed from the last crisis contexts (Kotb *et al.*, 2020). Muchmore, in order to gain a comprehensive picture of internal audit's role in risk management, future studies must continue investigate the actual role of internal audit in general, as prior literature suggests that its more of a versatile role within governance, rather than capturing its actual role (Roussy and Perron, 2018).

This research is not without limitations; however, it may offer perspectives for future studies. The limitations consist of the dataset size, that may not support generalized inference of the results. Muchmore, the performance analysis and science mapping would only allow a general picture of the research field. Therefore, future research may address a more detailed analysis of the studies included in the sample, with an in-depth examination of the abstract, research methods used, and the main results, as well as the distribution of topics per journal or the collaboration among universities.

Acknowledgments

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References

Abdelrahim, A. & Al-Malkawi, H.A.N. (2020) "The Influential Factors of Internal Audit Effectiveness: A Conceptual Model", *International Journal of Financial Studies*, vol.10, no. 3: 71

Aebi, V., Sabato, G. & Schmid, M. (2011) “Risk management, corporate governance, and bank performance in the financial crisis”, *Journal of Banking & Finance*, vol. 36, no. 12: 3213-3226

Alkaraan, F., Elmarzouky, M., Hussainey, K. & Venkatesh, V.G. (2023) “Sustainable strategic investment decision-making practices in UK companies: The influence of governance mechanisms on synergy between industry 4.0 and circular economy”, *Technological forecasting and social change*, vol.187: 122187

Ardianingsih, A. & Payamta, P. (2022) “Analysis of the Effectiveness of Risk- Based Internal Audit Implementation: A Case Study”, *Quality-Access to Success*, vol. 23, no.187: 271-279

Bananuka, J. & Nkundabanyanga, S.K. (2022) “Audit committee effectiveness, internal audit function, firm-specific attributes and internet financial reporting: A managerial perception-based evidence”, *Journal of financial reporting and accounting*, DOI 10.1108/JFRA-07-2021-0198

Beasley, M.S., Clune, R. & Hermanson, D.R. (2005) “Enterprise risk management: An empirical analysis of factors associated with the extent of implementation”, *Journal of Accounting and Public Policy*, vol. 24, no. 6: 521-531

Beasley, M.S., Bransa, B.C. & Hancock, B.V. (2008) “Audit Committee oversight over Enterprise Risk Management”, *Journal of Accountancy*, vol. 205, no. 4: 44-51

Beasley, M.S., Carcello, J.V., Hermanson, D.R. & Neal, T.L. (2009) “The Audit Committee Oversight Process”, *Contemporary Accounting Research*, vol. 26, no. 1: 65-122

Behrend., J. & Eulerich, M. (2019) “The evolution of internal audit research: a bibliometric analysis of published documents (1926–2016)”, *Accounting History Review*, vol. 29, no. 1: 103-139

Beuren, I.M., Machado, V.N. & Agnol, A.D. (2023) “Relevance of internal controls for risk management: empirical evidence from the perception of its executors and reviewers in a multinational company”, *Corporate Governance: The International Journal of Business in Society*, DOI 10.1108/CG-05-2022-0200

Carcello, J.V., Eulerich, M., Masli, A. & Wood, D.A. (2020) “Are Internal Audits Associated with Reductions in Perceived Risk?”, *Auditing: A Journal of Practice & Theory*, vol. 39, no. 3: 55-73

Carcello., J.V., Hermanson, D.R. & Ye, Z.S. (2011) “Corporate Governance Research in Accounting and Auditing: Insights, Practice Implications, and Future Research Directions”, *Auditing: A Journal of Practice & Theory*, vol. 30, no. 3: 1-31

Castellini, M. & Riso., V (2023) “Risk Management in Practice: A Multiple Case Study Analysis in Italian Municipalities”, *Journal of Risk and Financial Management*, vol. 16, no. 1: 30

Christopher, J. & Sarens, G., (2018) “Diffusion of Corporate Risk-Management Characteristics: Perspectives of Chief Audit Executives through a Survey Approach”, *Australian Journal of Public Administration*, vol. 77, no. 3: 427-441

COSO (1992) *Internal Control-Integrated Framework*, Committee of Sponsoring Organizations of the Treadway Commission

COSO (2004) *Enterprise Risk Management-Integrated Framework*, Committee of Sponsoring Organizations of the Treadway Commission

Cular, M., Slapnicar, S. & Vuko, T. (2020) “The Effect of Internal Auditors’ Engagement in Risk Management Consulting on External Auditors’ Reliance Decision”, *European accounting review*, vol. 29, no. 5: 999-1020

DeSimone, S., D’Onza, G. & Sarens, G. (2021) “Correlates of internal audit function involvement in sustainability audits”, *Journal of Management & Governance*, vol. 25, no. 2: 561-591

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. & Lim, W.M. (2021) *How to conduct a bibliometric analysis: An overview and guidelines*, Journal of Business Research, vol. 133: 285-296

Doyle, J., Ge, W. & McVay, S. (2007) “Determinants of weaknesses in internal control over financial reporting”, *Journal of Accounting and Economics*, vol. 44: 193-223

Fekete, I. (2022) "Supporting Decision-Making with the Tools of Risk Management", *Public finance quarterly-Hungary*, vol. 67, no. 5: 28-47

Ghafoor, Z., Ahmed, I. & Hassan, A. (2022) "Audit committee characteristics, enterprise risk management and stock price synchronicity", *Managerial auditing journal*, vol. 37, no. 1: 69-101

Goodwin-Stewart, J. & Kent, P. (2006) "The use of internal audit by Australian companies", *Managerial Auditing Journal*, vol. 21, no. 1: 81-101

Gordon., L.A., Loeb, M.P. & Tseng, C.Y. (2009) "Enterprise risk management and firm performance: A contingency perspective", *Journal of Accounting and Public Policy*, vol. 28: 301-327

Haapamaki, E. & Sihvonen, J. (2019) "Cybersecurity in accounting research", *Managerial Auditing Journal*, vol. 34, no. 7: 808-834

Hassan, M.K., Abdulkarim, M.E. & Ismael, H.R. (2021) "Risk governance: exploring the role of organizational culture", *Journal of Accounting and Organizational Change*, vol. 18, no. 1: 77-99

Hazaea, S., Zhu, J., Elamer, A.A. & Khatib, S. (2022) "Mapping the Literature of Internal Auditing in Europe: A Systematic Review and Agenda for Future", *Meditari accountancy research*, vol. 8, no. 1

Hazaea, S.A., Zhu, J., Al-Matari, E.M. & Ahmed, N. (2021) "Mapping of internal audit research in China: A systematic literature review and future research agenda", *Cogent Business & Management*, vol. 8, no. 1

Hazami-Ammar, S. (2019) "Internal auditors' perceptions of the function's ability to investigate fraud", *Journal of Applied Accounting Research*, vol. 20, nr. 2: 134-153

Hoyt, R.E. & Liebenberg, A.P. (2011) "The Value of Enterprise Risk Management", *The Journal of Risk and Insurance*, bol.78, no. 4: 795-822

Institute of Internal Auditors (2023) "About Internal Audit", available on-line at https://www.theiia.org/en/about-us/about-internal-audit/

Islam, M.S., Farah, N. & Stafford, T.F. (2018) "Factors associated with security/cybersecurity audit by internal audit function", *Managerial Auditing Journal*, vol. 33, no. 4: 376-409

Jensen, M.C. & Meckling, W.H. (1796) Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure, Journal of Financial Economics, vol. 3, no. 4: 305-360

Jia, J. & Bradbury, M.E. (2021) "Risk management committees and firm performance", *Australian Journal of Management*, vol. 46, no. 3: 369-388

Kabuye, F., Kato, J., Akugizibwe, I. & Bugambiro, N. (2019) "Internal control systems, working capital management and financial performance of supermarkets", *Cogent Business & Management*, vol. 6, no. 1

Kiral, H. & Karabacak, H. (2020) "Resolution of the Internal Audit-Based Role Conflicts in Risk Management: Evidence from Signaling Game Analysis", *Group decision and negotiation*, vol. 29, no. 5: 823-841

Klius, Y., Ivchenko, Y., Izhboldina, A. & Ivchenko, Y. (2020) "International approaches to organizing an internal control system at an enterprise in the digital era", *Economic Annals-XXI*, vol. 185, no. 9-10: 133-143

Kotb, A., Elbardan, H. & Halabi, H. (2020) "Mapping of internal audit research: a post-Enron structured literature review", *Accounting, Auditing & Accountability Journal*, vol. 33, no. 8: 1969-1996

Krishnan, J. (2005) "Audit Committee Quality and Internal Control: An Empirical Analysis", *The Accounting Review*, vol. 80, no. 2: 649-675

Lenning, J. & Gremyr, I. (2021) "Unleashing the potential of internal audits: a review and research agenda", *Total Quality Management & Business Excellence*, vol. 33, no. 9-10: 994-1010

Lin, S., Pizzini, M., Vargus., M. & Bardham, I.R. (2011) "The Role of the Internal Audit Function in the Disclosure of Material Weaknesses", *The Accounting Review*, vol. 86, no.1: 287-323

Lois., P., Drogalas, G., Karagiorgos, A. & Tsikalakis, K. (2020) "Internal audits in the digital era: opportunities risks and challenges", *EuroMed Journal of Business*, vol. 15, no. 2: 205-2017

Mazumder, M.M.M. & Hossain, D.M. (2018) "Research on Corporate Risk Reporting: Current Trends and Future Avenues", *Journal of Asian Finance, Economics and Business*, vol. 5, no. 1: 29-41

Nobanee., H., Alhajjar, M., Abushairah., G. & Al Harbi., S. (2021) "Reputational Risk and Sustainability: A Bibliometric Analysis of Relevant Literature", *Risks*, vol. 9, no. 7

Noor, N.M., Rasli, A., Rashid, M.A.A., Mubarak, M.F. & Abas, I.H. (2022) "Ranking of Corporate Governance Dimensions: A Delphi Study", *Administrative Sciences*, vol. 12

Onay, A. (2021) "Factors Affecting the Internal Audit Effectiveness: A Research of the Turkish Private Sector Organizations", *Ege Academic Review*

Onay, A. (2020) "The Role of Internal Audit from New Enterprise Risk Management Frameworks Perspective: Research in Turkey", *Istanbul business research*, vol. 49, no. 2: 177-200

Paape, L. & Spekle, R.F. "The Adoption and Design of Enterprise Risk Management Practices: An Empirical Study", *European Accounting Review*, vol. 21, no. 3: 533-564

Pan, L., Wang, L. & Feng, Q. (2022) "A Bibliometric Analysis of Risk Management in Foreign Direct Investment: Insights and Implications", *Sustainability*, vol. 14, no. 14: 1-18

Putra, I., Sulistiyo, U., Diah, E., Rahayu, S. & Hidayat, S. (2022) "The influence of internal, audit, risk management, whistleblowing system and big data analytics on the financial crime behavior prevention", *Cogent Economics & Finance*, vol. 10, no. 1, DOI: 10.1080/23322039.2022.2148363

Roussy, M. & Perron, A. (2018) "New Perspectives in Internal Audit Research: A Structured Literature Review", *Accounting Perspectives*, vol. 17, no. 3: 345-385

Sarens., G. & De Beelde., I. (2006) "Internal auditors' perception about their role in risk management", *Managerial Auditing Journal*, vol. 21, no. 1: 63-80

Soh., D.S.B. & Martinov-Bennie, N. (2011) "Perceptions of internal audit roles, effectiveness and evaluation", *Managerial Auditing Journal*, vol. 26, no. 7: 605-622

Spira, L.F. & Page, M. (2002) "The reinvention of internal control and changing role of internal audit", *Accounting, Auditing and Accountability Journal*, vol 16, no. 4: 640-661

Stafford, T., Deitz, G. & Li Y.J. (2018) "The role of internal audit and user training in information security policy compliance", *Managerial Auditing Journal*, vol. 33, no. 4: 410-424

Subramaniam, N., McManus, L. & Zhang, J. (2009) "Corporate governance, firm characteristics and risk management committee formation in Australian companies", *Managerial Accounting Journal*, vol. 24, no. 4: 316-339

Tamimi, O. (2021) "The Role of Internal Audit in Risk Management from the Perspective of Risk Managers in the Banking Sector", "*Australasian accounting business and finance journal"*, vol. 15, no. 2: 114-129

Turetken, O., Jethefer, S. & Ozkan, B. (2020) "Internal audit effectiveness: operationalization and influencing factors", *Managerial Auditing Journal*, vol. 35, no. 2: 238-271

Van der Stede, W.A. (2011) "Management Accounting Research in the Wake of the Crisis: Some Reflections", *European Accounting Review*, vol. 20, no. 4: 605-623

Velte, P. (2023) "Which attributes of audit committees are most beneficial for European companies? Literature review and research recommendations", *Journal of Global Responsibility*, DOI 10.1108/JGR-07-2022-0063

Weekes-Marshall, D. (2020) "The role of internal audit in the risk management process: A developing economy perspective", *Journal of Corporate Accounting and Finance*, vol. 31, no. 4: 154-165

White, S., Balley, S. & Asenova, D. (2020) "Blurred lines: Exploring internal auditor involvement in the local authority risk management function", *Public Money & Management*, vol. 40, no. 2: 102-112

Xiao, L. (2018) “Application of Internal Audit in Risk Management of Private Enterprises in Southwest China”, *Advances in Social Science, Education and Humanities Research*, vol. 252: 516-523

Yang, R., Yu, Y., Liu, M.L. & Wu, K. (2018) “Corporate Risk Disclosure and Audit Fee: A Text Mining Approach”, *European Accounting Review*, vol. 27, no. 3: 583-594

Yildirim, F. (2022) “Investigation of the Studies in the Field of Banking Risk Management via the Social Network Analysis”, *Sosyoekonomi*, vol. 30, no. 53: 155-172

Zhang, K., Wang, Y.Y., Cui, X.G. & Yue, H. (2022) “Can the academic experience of senior leadership improve corporate internal control quality?”, *Asian Business & Management*, vol. 21, no. 2: 231-260

SECTION 8 Sustainability 3

Non-Financial Reporting in Extracting Multinationals: Succinct Text Analysis

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Dana Kubíčková

Marie Fišerová

Sustainability Policies Analysis of Romanian Organizations Through the Prism of Economic Activity

Florin Mihai

Ofelia Aleca

Emilia Gogu

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Non-Financial Reporting in Extracting Multinationals: Succinct Text Analysis

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Abstract: **Idea:** *In this paper, we analyze recent annual reports of world mining giants. The motivation is that mining and extracting is a controversial industry. In this paper, we explore the dimensions of the chairman's statements of the ten largest mining multinationals in the post-COVID period.* **Data and tools:** *We perform a textual analysis of selected multinationals using the analytical software LIWC2022. Concentrate on their approach to mining and CSR issues as can be discerned from the text of the report. We explore letters to shareholders in nine dimensions of the text: namely, the dimension of Allure, Moral, Social, Negative tone, Positive tone, Cognitive processes, I-words, Authentic and Analytic which are evaluated by the linguistic programme LIWC2022.* **What's new?** *We have assessed the level of nine dimensions and compared the findings with the results of the previous literature and benchmark of professional text. This investigation enabled us to assess the differences between approaches of individual reports from different parts of the world and highlight their differences.* **Contribution:** *In our exploration, we have discovered that there are some interesting differences. Based on the analysis, we can state that identified differences depend on the cultural and historical environment in which the companies operate. The highest scores were found in cognitive processes in BARRICK, which is a Canadian gold mining company. And in the case of positive emotions. This concerned especially the Chinese company China Shenhua Energy. On the contrary, the lowest scores were found in negative emotions. Nevertheless, here, the differences between the companies were not very important. The authenticity values were both positive and negative, but the companies did not display any great differences in the group of analyzed companies.* **Limitations and further research:** *We have assessed the full text of letters to shareholders also some other parts of the report can be also interesting and revealing. We assume that the main message of each report is always displayed at the forefront of the text. However, the scores of individual dimensions can be somewhat biased and further, more detailed exploration is needed.*

Keywords: *Non-financial reporting, annual reports***,** *controversial industry, sustainability reporting, LIWC2022, mining giants, lexical analysis, dimensions, text analysis.*

1. Introduction

The main activity of extracting multinationals refers to the process of pulling out resources, assets, or operations from a foreign country where a multinational corporation based on its subsidiary or part of the value chain.

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Table 1. **The top ten best mining companies by revenue**

Rank	Name of Company	Revenue (USD billions)	Headquarters
1	Glencore PLC	75	British-Swiss
2	BHP Group Limited	65.09	Australian
3	Rio Tinto PLC.	63.49	British-Australian
4	China Shenhua Energy	53.38	China
5	Vale S.A.	43.83	Brasilia
6	Anglo American PLC	41.55	London
7	Coal India	14.5	India
8	BARRICK	11.9	Canada
9	Fortescue Metal Group Australia	22.2	Australia
10	Yanzhou Coal Mining Company	9.8	China

(*Source:* https://www.globaldata.com/companies/top-companies-by-sector/mining-accessed on 4.3.2023)

In this study, we evaluate the practical effects of new reporting requirements for sustainability. We chose five businesses multinationals from the group of top ten mining companies - a contentious industry to perform text analysis of selected parts of annual reports. We anticipate that reporting characteristics will be elaborated in more detail, especially in the environmental and social dimensions. Key participants in global value chains include various stakeholders, namely business partners, suppliers, investors, local communities, and governments. These stakeholders can benefit from sustainability reports and non-financial reporting. These practices in multinational organizations encourage them to develop and enhance their practice of responsibility in their global operations and, at the same time, these non-financial reports are equally important for large corporations themselves, allowing self-reflection.

Corporate Social Responsibility is captured by non-financial reporting. CSR is an important aspect of the business operations of large mining giants in the BRICS countries (Brazil, Russia, India, China, and South Africa) as well as outside this group. These companies are aware of the environmental and social impact of their extracting activities and are committed to making a positive difference (or impression?) in the communities where they operate. For Brief characteristics see Table 1.

Table 2. **Selected companies and their results in 2021**

Company	**Sales Revenues (mil. USD)**	**Net Profit (mil. USD)**	**Main activity**
Coal India Limited	93,818	12,699	Producer of coal (State company)
China Shenhua Energy Company Limited	404,005	62,197	Producer of coal and electricity (State company)
VALE, Brazil	228,816	121,228	Largest producer of ore and nickel in the world
Barrick, Gold Corporation, Canada	11,985	2,065	Largest producer of gold and copper
Fortescue Metal Group, Australia	22,284	10,295	Producer of the world's lowest cost iron ore

(*Source*: https://www.globaldata.com/companies/top-companies-by-sector/mining - accessed on 4.3.2023)

This is the fundamental concept on which the LIWC2022 program is constructed from the first version described by Francis and Pennebaker (1992) after this the following improvement of the programme were subsequently elaborated. The most recent evolution of the programme is LIWC22 see Boyd, Ashokkumar, Seraj, and Pennebaker (2022). The programme LIWC2022 enables linguistic analysis of the text from different psychological aspects and reveals the true author´s thinking, attitudes, and intentions. Content analysis of the texts means systematic transformation of coherent parts of the text into statistically manageable data representing the presence, intensity, or frequency of some relevant features (Shapiro and Markoff, 1997).

The program LIWC2022 provides any researcher with an automated, objective method for extracting insights about the attentional focus reflected through language (Boyd and Schwartz, 2021). Each word or word stem in the dictionary belongs to one or more pre-established categories with different meanings, most of them ensuing from psychological theories.

In the first stage, the programme LIWC2022 categorizes raw word counts characterizing the psychological aspects of the text. For each category, the percentage of the total number of words in the text is calculated. The five specific categories are:

- **a.** I-words (I, Me, My) depicting self-reference,
- **b.** Social words (e.g., they, she, us, talk, friends), the high percentage of such words signifies greater openness and higher social connection with others.
- **c.** Words of positive emotions which show a more optimistic position,
- **d.** Words of negative emotions refer to the opposite,
- **e.** Cognitive processes – these words reflect how much people are actively thinking about their writing topic, i.e., thinking, wonder, because, and knowledge.

In the second stage, four summary language variables are identified. The variables include:

1. Analytical thinking – is an analytically derived dimension that captures the degree to which people use words that suggest formal, logical, and hierarchical thinking patterns. People low in analytical thinking tend to write and think using language that is more narrative ways, focusing on the here-and-now, and personal experiences.

2. Clout-alure – this dimension captures the manner that the authors in speaking: either from the perspective of high expertise and is confident (high score), or a more tentative, humble, even anxious style (low score), thus refers to the relative social status.

3. Authentic – is a variable; the higher numbers of which are associated with a more honest, personal, and disclosing text; the lower numbers suggest a more guarded, distanced form of discourse.

4. Emotional tone – is a variable; the higher number of which is associated with a more positive, upbeat style; a low number reveals greater anxiety, sadness, or hostility; a number around 50 suggests either a lack of emotionality or different levels of ambivalence.

In line with the aim of our research, we analyzed the text of the first part of the Annual Reports & Accounts of the five mining companies selected from the top-ten biggest companies of the world. The basis for choosing these companies was a different cultural-historical environment. In these first parts of the Annual reports the chairman of the company summarizes the activity, intentions and approaches of the company in the past period.

In the text of this introductory part, we wanted to find out what attitudes and real considerations are contained in this communication and whether these attitudes differ in the communication of different companies. In line with the aim of our research, we analyzed the text of the first part of the Annual Reports & Accounts of the five mining companies selected from the top-ten biggest companies of the world. The basis for choosing these companies was a different cultural-historical environment.

In the text of this introductory part, we wanted to find out what attitudes and real considerations are contained in this communication and whether these attitudes differ in the communication of different companies.

The text of the Annual Reports was found on the websites of the analyzed firms. To perform the analysis, we have used the full version of the program LIWC2022. The findings are presented in Table 3. The text of the first parts of the firm´s annual reports was not the same length in all the selected companies (see the "Word Count" column in Table 3). The results of the analyses indicate the frequency of each of the word´s categories in percentage terms, the different ranges of text may slightly distort the results.

4. Findings

The results found by analyzing the introductory parts of the text of the annual report for selected companies using the full version of the LIWC2022 program are presented in Table No. 3. The values express the frequency of representation of words denominated as a reflection of the relevant parameter in the analyzed texts of five selected companies. At the same time - for comparison and interpretation - the value found within the program in the professional text category is presented in Table 3.

Table 3. **Individual dimensions and summary variables of text in the annual reports 2021**

	Coal India Ltd.	**China Shenhua Energy Co Ltd.**	**Vale Brazil**	**Barrick Gold Corporation**	**Fortescue Metal Group Australia**	***Average in professional or scientific writings***
Word count	*4256*	*1130*	*808*	*1903*	*1058*	*4256*
I-words (I, me, we)	0.23	0.09	0.25	0.26	0.95	*0.67*
Social Words	4.96	9.03	8.91	7.04	10.21	*7.95*
Positive emotions	2.19	6.37	3.71	2.89	2.93	*1.38*
negative emotions	0.31	0.09	0.25	1.05	0.09	*6.54*
cognitive processes	4.86	3.54	5.82	11.4	8.6	*2.33*
Analytic	98.46	97.42	98.82	91.84	79.74	*87.63*
Clout-allure	2.77	2.3	2.72	1.52	3.78	*3.58*
Authenticity	25.39	7.94	9.49	46.63	31.13	*28.90*
Emotional tone - moral	0,02	0.09	0.25	0.42	0.47	*0.30*

(*Source*: Own investigation)

Even these absolute values point to some general characteristics of the given type of text, i.e., a significant share of analytical words - this corresponds to an effort to explain individual areas, as well as a high share of authenticity in expression, which reflects an effort to arouse readers' trust. However, for this parameter, slightly different levels are visible for individual companies: the lowest is for Chinese and Brazilian companies.

In the use of social words and I-words there are not very many differences. While in the use of positive emotions there is a relatively higher level in the Chinese company. Also, in the category of social words there can be seen the greater level in the Australian company.

In the second phase of processing, we compare these values with the average value found by the program LIWC2022 in the professional texts. The resulting values are presented in Table 4.

Table 4. **Company values in comparison with the average of professional or scientific writings** *(in percent)*

	Coal India Limited	**China Shenhua Energy Comp. Ltd**	**VALE Brazil**	**BARRICK Gold Corporation**	**Fortescue Metal Group Australia**
I-words (I, me, we)	-0.657	-0.866	-0.627	-0.612	0.418
Social Words	-0.376	0.136	0.121	-0.114	0.284
Positive emotions	0.587	3.616	1.688	1.094	1.123
negative emotions	-0.953	-0.986	-0.962	-0.839	-0.986
cognitive processes	1.086	0.519	1.498	3.893	2.691
Analytic	0.124	0.112	0.128	0.048	-0.090
Clout - allure	-0.226	-0.358	-0.240	-0.575	0.056
Authenticity	-0.121	-0.725	-0.672	0.613	0.077
Emotional tone - moral	-0.933	-0.700	-0.167	0.400	0.567

(*Source*: Own investigation)

Graphical display of calculated values and differences eases the interpretation of findings is presented in Figure 1.

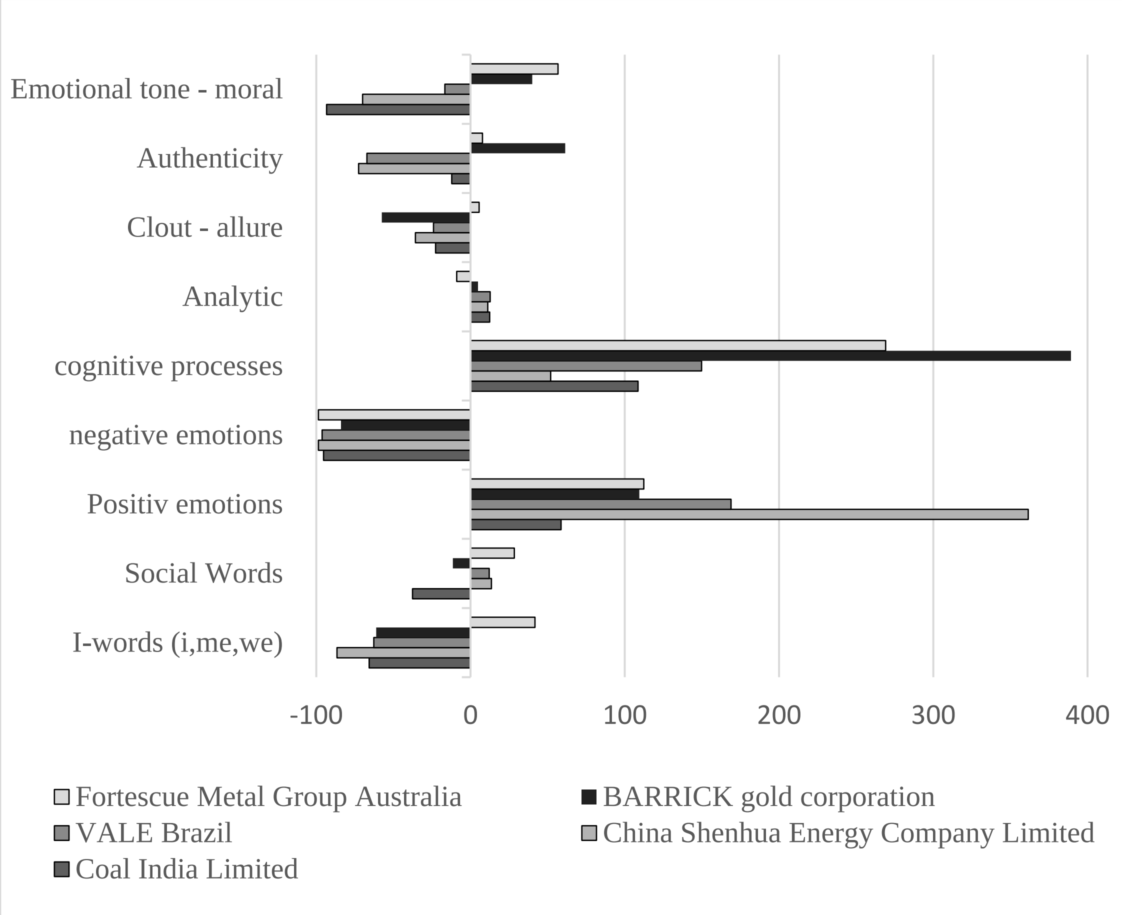

Figure 1. **Individual dimensions compared with the average value in professional or scientific texts**
(*Source*: Own investigation)

A comparison of the data with the average for professional writings result in several interesting findings:

1. The categories cognitive processes and positive emotions show the biggest positive differences. This is not surprising - the introductory text usually summarizes the main facts from the past period (cognitive words) and evaluates them positively (positive emotions).

2. The biggest negative difference found in all texts is the lower proportion of negative emotions. This can again be attributed to the purpose of the introductory word, when the reported results are presented in a positive manner, presenting successful company.

3. The different situations found for authenticity are interesting: a significantly lower proportion of these words compared to the professional text was found in the text of the report of the Chinese company and the Brazilian company, while a higher proportion was found in the text of the Barik gold corporation.

4. A similar situation, i.e., significantly lower than average score, can also be seen with the emotional tone parameter. But even here the values differ: the lowest emotional tone was found for the Indian company India coal with a small difference from the Chinese company Shengua. The Brazilian company also shows a lower value than the average.

The other two companies, i.e., Fortescue (Australia) and Barrick (Canada) have more emotional words in their report than the average of professional or scientific text.

5. In the category of words I, me, we, all companies, with the exception of the Australian one, show lower values than the average in this category.

6. In the Social words category, as well as in the Analytic category, the values of all companies are close to the professional text - the differences are both positive and negative and are relatively small.

7. What is interesting is the negative difference of all companies from the average of the professional text in the Clout-alure category, where only the Australian company achieved a higher value.

8. Similarly, it can be evaluated as an interesting difference in the Authenticity category, in which all companies, except Fortescue Australia and Barrick Canada, show a relatively significant negative difference compared to the professional text. The credibility or authenticity of the communicated facts in these companies is at a lower level than an average professional or scientific text.

5. Conclusion and limitations

The analysis shows that differences can be found in communicating and creating an overall image of the company, about the results achieved and the approach to the company's stakeholders. Based on the analysis, it can be stated that differences have been found and can be identified as dependent on the cultural and historical environment in which they operate. However, these conclusions require support in further research of similar texts and other companies to be formulated in this way. The conducted research has some limitations.

The constraints of this study can be twofold: one is concerning the qualitative methodology used when working with narratives. We need to stress that we are aware of the shortcomings this qualitative approach may bring; however, we tried to prevent a subjective view with a double-independent check.

The second limitation is more general, and it concerns the resources used, in general. With such controversial industries as mining and huge multinational companies, like Coal India Limited or Vale Brazil, taking into consideration operations in countries with a feeble legal structure one needs to inspect information from sources other than just sustainability reports and take into consideration the views of other important stakeholders which are not part of official company reports and can be inflated by possible impression management.

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References

Arvidsson, S. (2011) Disclosure of non-financial information in the annual report: A management-team perspective, *Journal of intellectual capital*. vol. 12, no 2: 277-300, https://doi.org/10.1108/ 14691931111123421

Boyd, R.L. & Schwartz, H.A. (2021) Natural language analysis and the psychology of verbal behavior: The past, present, and future states of the field, *Journal of Language and Social Psychology*, vol. 40, no 1: 21-41

Boyd, R.L., Ashokkumar, A., Seraj, S. & Pennebaker, J.W. (2022) The development and psychometric properties of LIWC-22. *Austin, TX: University of Texas at Austin*, 1-47

Directive No. 2014/95/EU Directive 2014/95/EU of The European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups available at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095: accessed on 10.5.2023

Francis, M.E. & Pennebaker, J.W. (1992) Putting stress into words: The impact of writing on physiological, absentee, and self-reported emotional well-being measures, *American Journal of Health Promotion*, vol. 6, no 4: 280-287, https://doi.org/10.4278/0890-1171-6.4.280

Markoff, J. & Shapiro, G. (1997) A matter of definition. *Text Analysis for the Social Sciences–Methods for Drawing Statistical Inferences from Texts and Transcripts*: 9-31

Krawczyk, P. (2021) Non-financial reporting – standardization options for SME sector, *Journal of Risk and Financial Management*, vol. 14, no. 9: 417, https://doi.org/10.3390/jrfm14090417

Peck, P. & Sinding, K. (2003) Environmental and social disclosure and data richness in the mining industry, *Business Strategy and the Environment*, vol. 12, no 3: 131-146

Sierra-Garcia, L., Garcia-Benau, M.A. & Bollas-Araya, H.M. (2018) Empirical analysis of non-financial reporting by Spanish companies, *Administrative Sciences*, vol. *8,* no 3: 29. https://doi.org/10.3390/admsci8030029

Skouloudis, A., Evangelinos, K. & Kourmousis, F. (2010) Assessing non-financial reports according to the Global Reporting Initiative guidelines: Evidence from Greece, *Journal of Cleaner Production*, vol. 18, no 5: 426-438

Turzo, T., Marzi, G., Favino, C. & Terzani, S. (2022) Non-financial reporting research and practice: Lessons from the last decade, *Journal of Cleaner Production*, vol. 345, no 1: 131-154, https://doi.org/10.1016/j.jclepro.2022

Wang, J. (2016) Literature review on the impression management in corporate information disclosure, *Modern Economy,* vol. 7, no 6: 725-731, https://doi.org/10.4236/me.2016.76076

Woźniak, J. & Pactwa, K. (2019) Analysis of the socio-environmental policy of selected mining companies on the basis of non-financial reporting, *Gospodarka surowcami mineralnymi,* vol. 35, no 1: 177–194, https://doi.org/10.24425/gsm.2019.128206

Yasseen, Y., Moola-Yasseen, M. & Padia, N. (2017) A preliminary study into impression management practices in chairman's statements in South African annual reports: an attribution theory perspective, *Communicare: Journal for Communication Sciences in Southern Africa,* vol.36, no 1: 47-66, https://doi.org/10.36615/jcsa.v36i1.1578

Sustainability Policies Analysis of Romanian Organizations Through the Prism of Economic Activity

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Abstract: *This article aims to analyze the sustainability policies of organizations in Romania through the lens of the pressures induced by the growth of economic activity. Using a quantitative and qualitative methodology, the content of sustainability reports published by companies in Romania listed in the top 500 based on the number of employees was analyzed, and economic and financial data were collected from topfirme.ro. The sustainability score was calculated based on the reporting according to the Global Reporting Initiative (GRI) standard in the three dimensions: environmental, economic, and social – the scores about how the integrated report was published within the group or local report was analyzed. The research formulated and tested hypotheses regarding the factors that could influence reporting on activities carried out for sustainability purposes, such as the number of employees, total revenues, net assets, stakeholder interest, etc. The study found that sustainability policies related to procurement practices, anti-competitive behavior, biodiversity, and child protection regarding their employability positively but moderately influence a crucial economic indicator, a company's total revenue. This suggests that the sustainability management systems implemented by firms in Romania have yet to reach the necessary maturity to create a clear link between sustainability policies and the economic performance of companies. Furthermore, regarding the company's belonging to a group, the research showed that this aspect does not influence sustainability policies. The information in this paper is of interest in actions taken to ensure sustainable economic processes within organizations in Romania and for future research in the field.*

Keywords: *Non-financial reporting, sustainability report, sustainability policies, GRI standards, economic indicators.*

1. Introduction

With the increasing urgency of climate change, which negatively affects emerging economies with fragile infrastructures, sustainability reporting studies are essential (Gunawan *et al.*, 2022). In this context, it is crucial to study the influence of sustainability reports on the economic performance of companies. Moreover, the sustainability report is an essential communication tool because it provides detailed information on the leading sustainability directions and environmental protection. The sustainability report also ensures high transparency regarding environmental risk activities (Venturelli *et al.*, 2020).

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Reporting on the sustainability of an organization provides information on the impact of economic activities on the environment. Analyzing these reports can provide important insights into the effectiveness of sustainability policies and their potential impact on the economic performance of companies.

The directions addressed by a sustainability report primarily provide essential information on the three pillars of organizational activity reporting: social = people, environment = planet, economic = profit (Amin *et al.*, 2022).

Sustainability reporting involves, on the one hand, regulatory activity at the European or national level. On the other hand, international professional organizations such as the International Federation of Accountants (IFAC) or national ones (Body of Expert and Licensed Accountants of Romania - CECAR in Romania) can also be involved (Ortiz-Martínez and Marín-Hernández, 2020). Since regulatory aspects can be international and localized at the national or regional level, comparability is a fundamental problem with sustainability reports (Venturelli *et al.*, 2020).

A report published by KPMG in 2017 revealed that in Europe, the number of organizations publishing sustainability reports increased by 2 percent in 2013 compared to the previous period, reaching 73%. However, particular areas still need to improve sustainability information, with low reporting rates recorded mainly in Eastern European, African, and Middle Eastern countries (Amin *et al.*, 2022).

The Bucharest Stock Exchange launched in September 2020; the first initiative focused on ESG reporting for the Romanian capital market by providing sustainability information for listed companies through sustainability scores (Nechita, 2021).

In the context of sustainable development, companies have begun to recognize the importance of sustainability for long-term economic performance. A comprehensive sustainability report indicates concerns about current climate change, population growth, and technological changes, which can attract investors and customers. A responsible approach to social and environmental issues can also help build a positive reputation.

At the European level, the Directive on Non-Financial Reporting (Directive 2014/95/EU) (European Commission, 2017) is one of the leading legal instruments to promote sustainability reporting, which came into force in 2017. The European Directive applies to European listed companies and large unlisted companies. It requires them to report annually on their impact on the environment, society, and governance, using international reporting standards such as GRI (Global Reporting Initiative) or IIRC (International Integrated Reporting Council).

In Romania, a member country of the European Union, there is an increase in sustainability reporting, the transposition of the European directive being Order no. 1938/2016 (Ministry of Public Finance, 2016). More and more companies have started to publish detailed sustainability reports by specific standards. In addition, although there is mandatory legislation and standards for sustainability reporting in Romania, many organizations do not publish their sustainability reports.

Although there are numerous studies on sustainability reporting at the European level (Opferkuch *et al.*, 2022; Perello-Marin *et al.*, 2022) or for certain European countries Spain (Ibáñez- Forés *et al.*, 2022) and Poland (Michalska-Szajer *et al.*, 2021), we have yet to identify studies analyzing sustainability reports through the GRI standard at the Romanian level. Studies (Matuszak and Różańska, 2021) identified an increase in reporting on human rights and the fight against corruption between 2015 and 2017. The analysis of sustainability reports was carried out from the point of view of the information disclosed (Galant and Cerne, 2017; Tiron-Tudor *et al.*, 2019) and increased the volume of information disclosed (Lungu *et al.*, 2011).

2. Literature review

Organizations publish sustainability reports to provide transparent and comparable information about sustainability performance for investors, clients, employees, and other stakeholders.

Although most organizations in Romania have not implemented a sustainability management system based on standards and procedures for evaluating activities in this direction, some Romanian researchers are concerned about issues related to this topic, probably also from the perspective of networking in which they are involved together with researchers from abroad.

A significant number of studies in the literature have investigated the size and content of sustainability reports about corporate characteristics such as company size or specific indicators in the field of activity (Duran and Rodrigo, 2018; Galant and Cerne, 2017; Lungu *et al.*, 2011; Tiron-Tudor *et al.*, 2019; Venturelli *et al.*, 2017).

Several studies identify a positive correlation between company size, stock market listing, and the volume of environmental information presented in reports (Nechita, 2021). In addition, some studies show that organization size influences reporting, with organizations with enormous revenues or employees reporting more aspects in sustainability reports (Galant and Cerne, 2017; Tiron-Tudor *et al.*, 2019). The size of the organization and its influences on sustainability reports have been analyzed by (Venturelli *et al.*, 2017), concluding that multinational organizations whose large size and share of international markets encourage them to pay more attention to their global reputation derived from the quality of their non-financial information, which includes sustainability issues. On the other hand, some authors (Korca and Costa, 2021) consider that the obligation to report only sometimes leads to improved non-financial reporting.

Structurally, GRI standards (Table 1) address sustainability through dimensions: Standards for reporting organization (GRI 100), Standards for economic dimension (GRI 200), Standards for environmental dimension (GRI 300), and Standards for social dimension (GRI 400).

Table 1. **GRI standards**

GRI Standard	Specific indexes
GRI 100 Presentation Three indexes	GRI 101_Foundation
	GRI 102_General Disclosures
	GRI 103_Management Approach
GRI 200	GRI 201_Economic Performance

Economic Seven indexes	GRI 202_Market Presence
	GRI 203_Indirect Economic Impacts
	GRI 204_Procurement Practices
	GRI 205_Anti-Corruption
	GRI 206_Anti-competitive Behavior
	GRI 207_Tax
GRI 300 Environment Eight indexes	GRI 301_Materials
	GRI 302_Energy
	GRI 303_Water and Effluents
	GRI 304_Biodiversity
	GRI 305_ Emissions
	GRI 306_ Effluents and Waste
	GRI 307_Environmental Compliance (removed from version 2021)
	GRI 308_Supplier Environmental Assessment
GRI 400 Social 19 indexes	GRI 401_Employment
	GRI 402_Labor/Management Relations
	GRI 403_Occupational Health and Safety
	GRI 404_Training and Education
	GRI 405_Diversity and Equal Opportunity
	GRI 406_Non-discrimination
	GRI 407_Freedom of Association and Collective Bargaining
	GRI 408_Child Labor
	GRI 409_Forced or Compulsory Labor
	GRI 410_Security Practices
	GRI 411_Rights of Indigenous Peoples
	GRI 412_Human rights assessment (Removed from version 2021)
	GRI 413_Local Communities
	GRI 414_Supplier Social Assessment
	GRI 415_Public Policy
	GRI 416_Customer Health and Safety
	GRI 417_Marketing and Labeling
	GRI 418_Customer Privacy
	GRI 419_Socioeconomic Compliance (removed from version 2021)

A study conducted for Japanese manufacturing companies (Fujii *et al.*, 2013) identified a positive association between CO2/toxic substance emissions performance and Return on assets (ROA). Environmental performance helps increase ROA through both sales' profitability and revenue. Another study on UK companies (Broadstock *et al.*, 2018) found a link between carbon emissions and economic and financial performance policies.

Regarding corporate performance, studies (Khoja *et al.*, 2022; Ortiz-Martínez and Marín-Hernández, 2020; Úbeda-García *et al.*, 2021) show that corporate social responsibility practices must play an essential role in the management of companies to achieve improvement in this area.

Cardinali and De Giovanni (2022) work investigated the influence of economic factors (profitability, market share, cost reduction, energy expenses) of sustainable practices and digital technologies on social responsibility, concluding that firms prioritize economic performance, then environmental protection concerns, and finally social pillars., Excellent economic results serve as a driver for sustainably achieving other objectives, as being environmentally and socially responsible is costly; investments in digital technologies mainly target AI and IoT sensor technologies, followed by Machine Learning and Intelligent Transportation Systems, and adopt innovations in ecological processes, an ecological packaging, recycling materials, and energy.

3. Research methodology

The research objective was the content analysis of sustainability reports of companies in Romania based on the GRI standard, which allows for easier and more efficient comparison and analysis. To achieve this study, the following steps were taken: collecting sustainability reports, analyzing correlations between sustainability information and economic characteristics of companies, such as total revenue, total expenses, net profit, etc., and determining the results (Figure 1).

Based on previous research (Lungu *et al.*, 2011; Tiron-Tudor *et al.*, 2019), data presented by organizations regarding sustainability in the three dimensions: economic, social, and environmental, as well as economic and financial characteristics of organizations, were collected and analyzed.

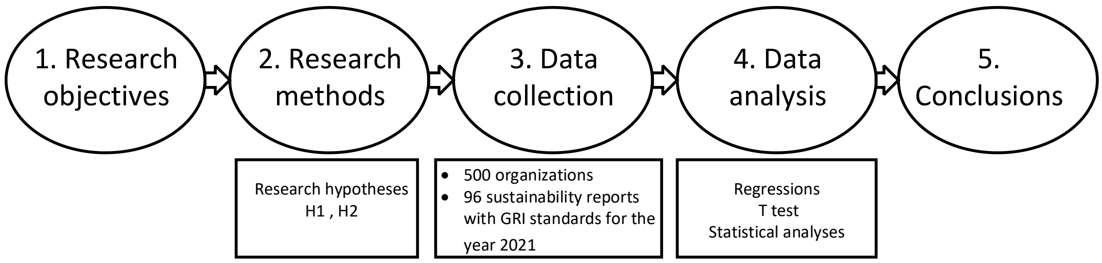


Figure 1. **Research methodology**

One of the first directions of the research consisted of analyzing the sustainability reports of the top 500 companies with the most employees (from the topfirme.ro website) and calculating the sustainability score for each dimension: presentation, environment, social, and economic.

A second direction involved analyzing the correlations between sustainability information and economic characteristics of the companies, such as total revenues, net assets, and several employees.

Based on previous research (Lungu *et al.*, 2011; Tiron-Tudor *et al.*, 2019), data analysis was performed through statistical analyses, correlations, statistical tests, and regressions between economic, social, and environmental information presented by organizations and their characteristics, such as size, reporting type, and several employees.

The preliminary data study found that variables related to the companies' economic activity, total assets, net assets, and an average number of employees exhibit a high degree of asymmetry of distribution values compared to their mean. In addition, the standard deviation shows a high dispersion of values compared to their mean. For this reason, the variables that characterize the economic activity of companies were used in the research as logarithms (Table 2).

Table 2. **Description of the used variables**

Variable code	Variable name/Description	Reference
A. Variables for the economic characterization of companies		
LOG_NA	Natural logarithm of the average number of employees in the fiscal year	Galant and Cerne, 2017; Tiron-Tudor *et al.*, 2019
LOG_AN	Natural logarithm of the net asset value at the end of the fiscal year	
LOG_TV	Natural logarithm of the total revenue at the end of the fiscal year. It is an important indicator for shareholders, as part of the net income allocated to shareholders as dividends.	Duran and Rodrigo, 2018
TR	Type of report (*1* - reported local data in the report issued by the parent company or the group they belong to; *2* - prepared and published a local report)	Venturelli *et al.*, 2017
B. Variables related to sustainability reporting		
T200	Score of the sustainability report on the economic dimension	Amin *et al.*, 2022; Duran and Rodrigo, 2018; Venturelli *et al.*, 2017
T300	Score of the sustainability report on the environment dimension	Amin *et al.*, 2022; Duran and Rodrigo, 2018; Venturelli *et al.*, 2017
T400	Score of the sustainability report on the social dimension	Amin *et al.*, 2022; Duran and Rodrigo, 2018; Venturelli *et al.*, 2017

The following hypotheses were formulated:

- H1. *There are differences in sustainability reporting performance based on a company's membership in an organized group.*
- H2. *The company's economic performance, expressed through total revenue, is positively influenced by procurement policies of companies, expressed through the GRI index in the sustainability report.*

4. Data analysis

In this stage, the first 500 companies from the topfirme.ro website was selected for analysis, which ranks the companies in Romania based on their number of employees (*Top Companies from Romania*, n.d.). The number of employees is also a criterion for reporting sustainability information under Romanian regulations (Ministry of Public Finance, 2016). The sustainability reports published for the year 2021 were analyzed. The sustainability reports from companies in this research were collected on their official websites, and economic activity data were obtained from the topfirme.ro platform. The analysis of the sustainability report content by identifying the GRI index (table 1) and calculating sustainability scores for the environmental (T300), economic (T200), and social (T300) dimensions was performed by the researchers.

Graphical representations were created using Microsoft Excel, and statistical analysis was done using the open-source software JAMOVI (The Jamovi project, n.d.). The data analysis process began with a descriptive statistical analysis, with relevant aspects having implications for the study being retained. Table 3 presents the classification of industries according to the CAEN code valid in Romania (Ministry of Justice, n.d.).

Table 3. **The industries, according to https://caen.ro/**

Code	Industry Name	Code	Industry Name
A	Agriculture, forestry, and fishing	K	Financial intermediation and insurance
B	Mining and quarrying	L	Real estate activities
C	Manufacturing	M	Professional, scientific and technical activities
D	Electricity, gas, steam, and air conditioning supply	N	Administrative and support service activities
E	Water supply; sewerage, waste management, and remediation activities	O	Public administration and defense; compulsory social security
F	Construction	P	Education
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	R	Arts, entertainment, and recreation
H	Transportation and storage	S	Other service activities
I	Accommodation and food service activities	T	Activities of households as employers of domestic personnel; production of goods and services for own use by households
J	Information and communication	U	Activities of extraterritorial organizations and bodies

Table 4 presents annual information on companies that have prepared sustainability reports according to GRI standards, by industry and reporting type (within the group or locally), with most of them belonging to industry C (Manufacturing Industry) and most reports being issued by the parent or group company of the organizations.

Table 4. **Number of organizations by industry**

Industry	Number of organizations	% from total organizations	An organization that reported local data in the report issued by the parent company or the group they belong to (TR=1)	An organization that produced and published a local report (TR=2)	Total organizations that publish a sustainability report
A	3	0.60	1	0	1
B	6	1.20	0	3	3
C	189	37.80	33	9	42
D	17	3.40	0	11	11
E	29	5.8	0	0	0
F	18	3.60	2	0	2
G	62	12.40	7	4	11
H	40	8	3	2	5
I	6	1.20	1	1	2
J	35	7	6	0	6
K	1	0.20	0	1	1
L	2	0.40	0	0	0
M	21	2.20	3	3	6
N	52	10.20	3	1	4
O	5	1	0	0	0
Q	7	1.4	0	2	2
R	7	1.4	0	0	0
Total	500	100	59	37	96

Of the total sustainability reports analyzed, 61.5% represent reports made within the group, and only 38.5% represent local reports (figure 2). The small number of organizations that have produced local sustainability reports is also due to the obligation of non-financial reporting within the countries of the European Union, countries of which the groups are a part.

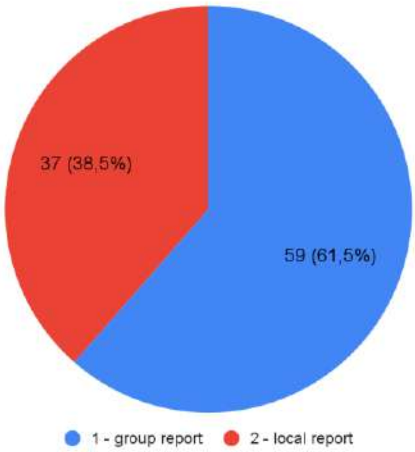


Figure 2. **Number of sustainability reports with GRI standard**

A GRI-based report covers several categories of topics, including those related to the dimensions specified in GRI standards (table 1): activity description (GRI 100), social dimension (GRI 300), economic dimension (GRI 200), and environmental dimension (GRI 400).

For each report and each dimension, a score between 0-2 points was awarded (according to Table 5), with a maximum score of 74 points (37 indicators * 2 points). Table 5 presents the scoring method based on which the sustainability score for each annual report will be calculated.

Table 5. **Scoring method for sustainability dimension**

No.	Details	Score (0-2)
1.	No specific indicator was mentioned	0
2.	A brief statement about the specific indicators of that dimension	1
3.	Detailed information on specific indicators with the specification of GRI standard	2

The analyzed sustainability reports ranged from narrative descriptions to the detailed presentation of the GRI index. The overall score for the economic dimension (T200) varied from 0 points to 14 points, with an average score of 7.4; for the social dimension (T400), it varied between 0 and 38 with an average score of 19.4, while for the social dimension average (T300) total values were between 0 and 16 with an average value of 10.6 (table 6).

Table 6. **Statistics of sustainability report indicators**

	T100	T200	T300	T400
N	96	96	96	96
Missing	0	0	0	0
Mean	5.39	7.4	10.6	19.4
Median	6	8	11	20

	T100	T200	T300	T400
Standard deviation	1.5	3.64	3.84	9.46
Variance	2.24	13.2	14.8	89.4
Minimum	0	0	0	0
Maximum	7	14	16	38

To compare sustainability scores across the three dimensions, the average score for each dimension was weighted by the number of indicators in that dimension (7 for the economic dimension GRI 200, 8 for the environmental dimension GRI 300, 19 for the social dimension GRI 400), and for the total score, it was weighted by the sum of the number of indicators in each dimension (34 indicators).

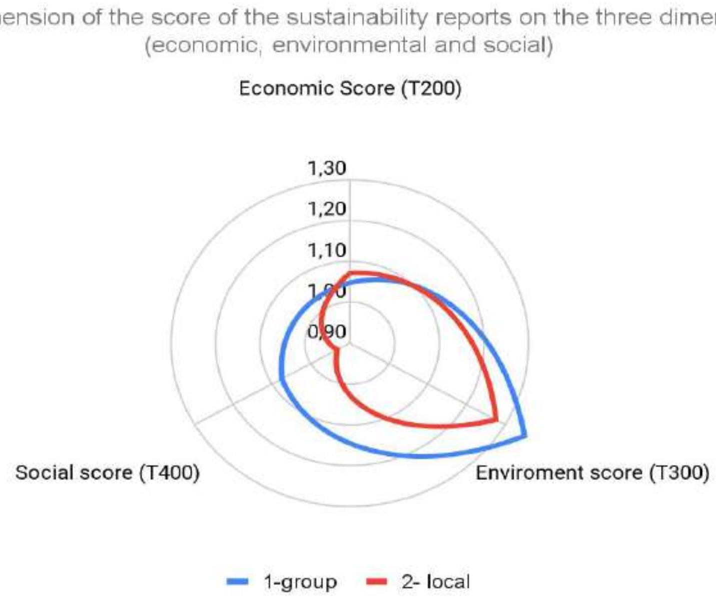


Figure 3. **Dimensional score of sustainability reports across the three dimensions (economic, environmental, and social)**

Analyzing the weighted sustainability scores of the sustainability reports obtained for the three dimensions, it is found that more GRI indexes are reported on the environmental dimension (a weighted score of 1.35) than on the social (weighted score of 1.07) and economic dimensions (a weighted score of 1.05). This means that within sustainability reports, concerns related to environmental protection are more significant than social and economic ones. Furthermore, among organizations reporting within the group, the highest sustainability report scores were identified for the social and environmental dimensions (figure 3). On the other hand, local reporting organizations scored the highest on the economic dimension and the lowest on the social and environmental dimensions.

Regarding the unreported GRI indices (figure 4), in the economic dimension, the *GRI 207_Tax index* has the highest non-reporting rate (70.83%), followed by *GRI 202* (69.79%). In the environmental dimension, *GRI 304* has the highest non-reporting rate (68.75%). In contrast, in the social dimension, *GRI 408_Child Labor* has the highest non-reporting rate (100% of organizations did not report), followed by *GRI 410_Security Practices* (86.45% of organizations did not report) and *GRI 411_Rights of Indigenous Peoples* (89.58% of organizations did not report).

Regarding the reporting approach, it was found that organizations that report locally have fewer reported indicators than those reported within the group (figure 4).

To compare the reporting of specific GRI indicators in each dimension, the number of non-reported indicators was totaled for each dimension, and the proportion of non-reported indicators was calculated. Thus, the reporting of the social dimension (*GRI 400*) with a proportion of 48.90% non-reported indicators (892 non-reported out of a total of 1824) was less present in sustainability reports than the reporting based on their economic dimension (*GRI* 200) with a proportion of 47.17% non-reported indicators (317 non-reported out of a total of 7*96=672) and environmental dimension (*GRI 300*) with a proportion of 33.98% non-reported indicators (261 non-reported out of a total of 768).

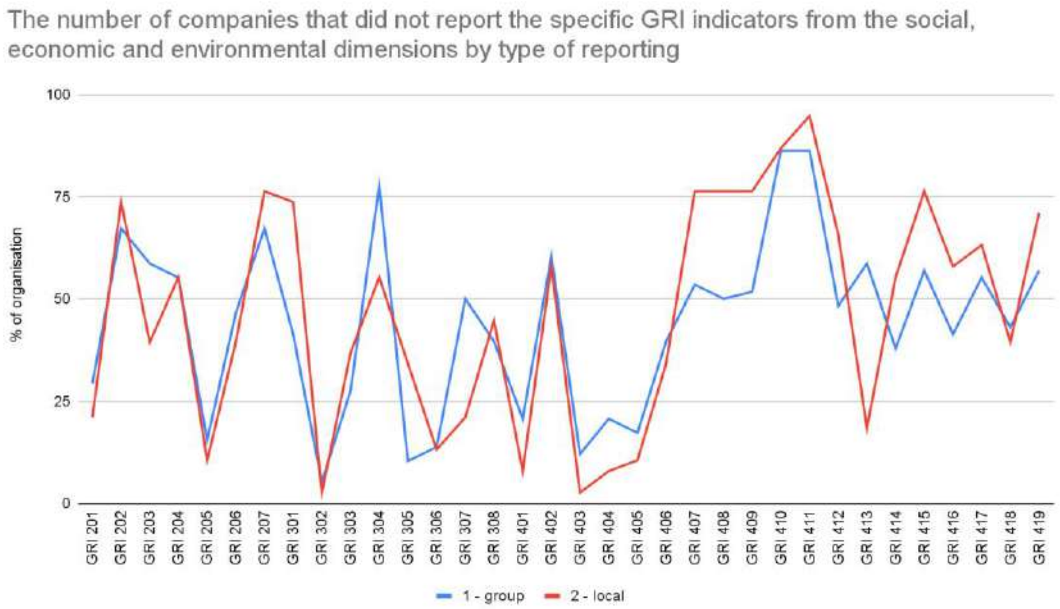


Figure 4. **Number of companies that did not report GRI indices from the social, economic, and environmental dimensions by reporting type.**

To test hypothesis H1, the independent T-test was used to identify whether there were statistically significant differences in sustainability reporting performance expressed by the sustainability score (T) depending on whether a company belongs to a group of organizations (TR).

The following statistical hypotheses were considered:

H0*: $\mu 1 = \mu 2$ there are no statistically significant differences in sustainability reporting performance expressed by the sustainability score (T) depending on whether a company belongs to a group of organizations (TR).*

H1*: $\mu 1 <> \mu 2$ there are statistically significant differences in sustainability reporting performance expressed by the sustainability score (T) depending on whether a company belongs to a group of organizations (TR).*

The results of the statistical analysis are presented in Table 7.

Table 7. **Independent Samples T-Test for TR**

		Statistic	df	p	Mean difference	SE difference
T	Student's t	1.129	94	0.262	3.68	3.26
	Welch's t	1.23	93.4	0.221	3.68	2.99
	Mann-Whitney U	921		0.199	4.00	

Note. H_a $\mu_0 \neq \mu_1$

The critical T statistic value is 2.27, while the calculated T statistic value is 1.129, so the null hypothesis is not rejected. Therefore, there are no statistically significant differences regarding sustainability reporting performance expressed by the sustainability score (T) based on the belonging of a company to a group of organizations (TR). Additionally, since the p-value is very high, the null hypothesis cannot be rejected, and the alternative hypothesis (H1) is invalidated.

The analysis examines the correlations between information from sustainability reports and the economic characteristics of organizations.

Table 8. **Correlation Matrix**

		LOG_TV	LOG_CH	LOG_AN	LOG_NA	T200	T300	T400
LOG_TV	Pearson's r	—						
	p-value	—						
LOG_CH	Pearson's r	0.983***	—					
	p-value	<0 .001	—					
LOG_AN	Pearson's r	0.659***	0.579***	—				
	p-value	< 0.001	< 0.001	—				
LOG_NA	Pearson's r	0.626***	0.678***	0.328**	—			
	p-value	<0 .001	< 0.001	0.001	—			
T200	Pearson's r	0.272**	0.26*	0.223*	0.052	—		
	p-value	0.007	0.011	0.034	0.615	—		
T300	Pearson's r	0.249*	0.26*	0.229*	0.117	0.595***	—	
	p-value	0.014	0.011	0.029	0.255	< 0.001	—	
T400	Pearson's r	0.222*	0.225*	0.172	0.112	0.734***	0.606***	—
	p-value	0.03	0.027	0.102	0.276	< 0.001	<0 .001	—
TR	Pearson's r	0.16	0.12	0.367***	0.052	0.026	-0.076	-0.137
	p-value	0.119	0.243	<0 .001	0.617	0.803	0.461	0.183

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

From the analysis of the information presented in the correlation matrix shown in table 8, the following can be concluded:

- There is a moderate direct correlation between total revenues (LOG_TV) and the economic sustainability score (T200) with a coefficient of 0.272, but slightly higher than the moderate direct correlation between total revenues (LOG_TV) and the sustainability score for the environmental dimension (T300) with a coefficient of 0.249, and the moderate direct correlation between total revenues (LOG_TV) and the social sustainability score (T400) with a coefficient of 0.222. Based on this analysis, it is found that the leading aggregated GRI indicators: T200 (economic dimension), T300 (environmental dimension), and T400 (social dimension), have a moderate positive impact on the economic performance of companies expressed through total revenues. A detailed analysis of the impact of GRI indicators within each category is carried out in two regression models within this research.

- There is a moderate direct correlation between total expenses (LOG_CH) and the economic sustainability score (T200) with a coefficient of 0.260, to the same extent as the moderate direct correlation between total expenses (LOG_CH) and the sustainability score for the environmental dimension (T300) with a coefficient of 0.26, but slightly higher than the moderate direct correlation between total expenses (LOG_CH) and the social sustainability score (T400) with a coefficient of 0.225. This analysis reflects the moderate positive impact that the leading aggregated GRI indicators: T200 (economic dimension), T300 (environmental dimension), and T400 (social dimension), have on the economic performance of enterprises expressed through total expenses.
- There is a moderate direct correlation between total assets (LOG_AN) and the economic sustainability score (T200) with a coefficient of 0.223, which is slightly lower than the moderate direct correlation between total assets (LOG_AN) and the sustainability score for the environmental dimension (T300) with a coefficient of 0.229. Net assets (LOG_AN) are one of the very important indicators that express the value of a company, with shareholders being very interested in its value. Following this analysis, it is found that mainly the indicators from the environmental and social dimensions have a moderate positive impact on net assets. This is because companies are very concerned about the environmental and social aspects of their activities.
- There is a moderate direct correlation between the type of sustainability report (TR) and net assets (LOG_AN) with a coefficient of 0.367. Organizations that report locally have higher net assets than organizations that report within the group report.
- There is a high direct correlation between the score of the social dimension (T400) and the score of the economic dimension (T200) with a coefficient of 0.734, higher than the high direct correlation between the score of the social dimension (T400) and the score of the environmental dimension (T300) with a coefficient of 0.606, and the reasonable direct correlation between the score of the economic dimension (T200) and the score of the environmental dimension (T300) with a coefficient of 0.595. The analysis reflects the direct positive impact between the three aggregated GRI indicators and the integrated way in which they are addressed within companies.
- There are high direct correlations between the variables that characterize the economic activity of companies, reflecting the interdependence of economic data between them.

To test hypothesis **H2**, a regression model was constructed to highlight the extent to which the economic performance of companies reflected in their total revenues (LOG_TV) depends on their sustainability policy reflected in the GRI indicator scores from their sustainability reports. The values of the dependent variable (LOG_TV) were taken from the topfirme.ro web platform, while the values of the independent variables were calculated in this study based on the sustainability reports and specific GRI indicators published on the companies' official websites.

Through the first regression model, the attempt is made to identify the extent to which the economic performance of companies reflected in their total revenue (dependent variable LOG_TV) can be explained through independent variables (GRI_101, GRI_102, GRI_103, GRI_201, GRI_202, GRI_203, GRI_204, GRI_205, GRI_206, GRI_207, GRI_301, GRI_302, GRI_303, GRI_304, GRI_305, GRI_306, GRI_307,

GRI_308, GRI_401, GRI_402, GRI_403, GRI_404, GRI_405, GRI_406, GRI_407, GRI_408, GRI_409, GRI_410, GRI_411, GRI_412, GRI_413, GRI_414, GRI_415, GRI_416, GRI_417, GRI_418, GRI_419) that characterize the sustainability of companies.

The logical architecture of the regression model is presented in Figure 5. The Backward method was applied to introduce the independent variables in the model presented in Figure 5.

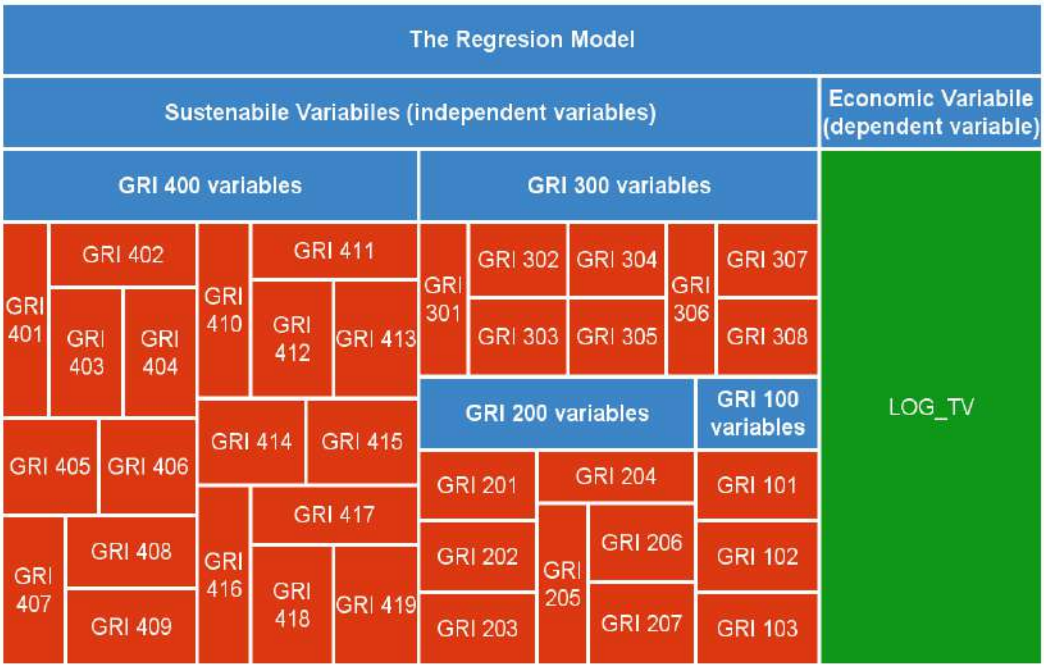


Figure 5. **The regression architecture model**

By applying JAMOVI software, for the regression, the most significant model is presented in table 9 and Table 10.

Table 9. **Model Fit Measures for the regression**

Model	R	R^2	F	df1	df2	p
1	0.54	0.292	5.17	7	88	< .001

Based on Table 9 is observed that the value of the F coefficient is equal to 5.17 for the significant coefficient is lower to 0,001. These values indicate that the regression equation obtained is useful for the intended purpose of prior research; therefore, the model is valid.

Table 10. **Collinearity statistics for the regression**

Predictor	VIF	Tolerance
GRI_102	1.14	0.875
GRI_204	1.23	0.812
GRI_205	1.5	0.665
GRI_206	1.22	0.819
GRI_304	1.24	0.806
GRI_408	1.37	0.728
GRI_411	1.67	0.598

The Variance Inflation Factor (VIF) values show (table 10) no multicollinearity in the model. These values indicate that the regression equation obtained is good for the intended purpose of this research; therefore, the model is valid.

The predictors remaining in the last significant model are the following (table 11): GRI_102, GRI_204, GRI_205, GRI_206, GRI_304, GRI_408, and GRI_411.

Table 11. **Model coefficients - LOG_TV for the regression**

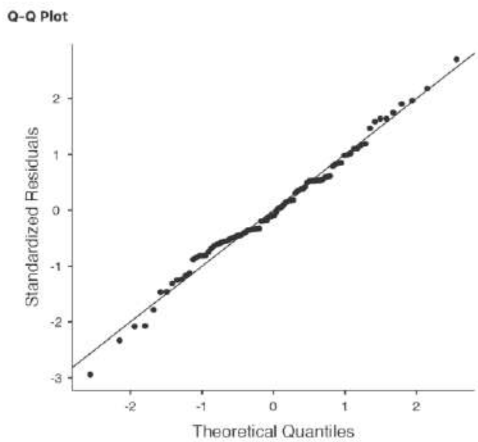
Predictor	Estimate	SE	t	p
Intercept	9.289	0.239	38.87	< .001
GRI_102	-0.259	0.1242	-2.09	0.04
GRI_204	0.246	0.0576	4.28	< .001
GRI_205	-0.192	0.0925	-2.07	0.041
GRI_206	0.138	0.0575	2.4	0.018
GRI_304	0.171	0.062	2.76	0.007
GRI_408	0.153	0.0619	2.48	0.015
GRI_411	-0.238	0.1093	-2.18	0.032

Based on Table 11 is seen that the regression equation obtained explains 29,2% (value of R square - coefficient of determination) of LOG_TV variance. Furthermore, the R (0.54) value revealed a moderate correlation between the predictors' variables and LOG_TV dependent variable.

The regression equation obtained is presented in formula (1).

LOG_TV = 9,289 - 0,259 GRI_102 + 0,246 GRI_204 - 0,192 GRI_205 + 0,138 GRI_206 + 0,171 GRI_304 + 0,153 GRI_408 - 0,238 GRI_411 (1)

Based on visual observations (figure 6), residuals are within accepted limits, and LOG_TV distribution is in the same proportion as the predicted distribution.



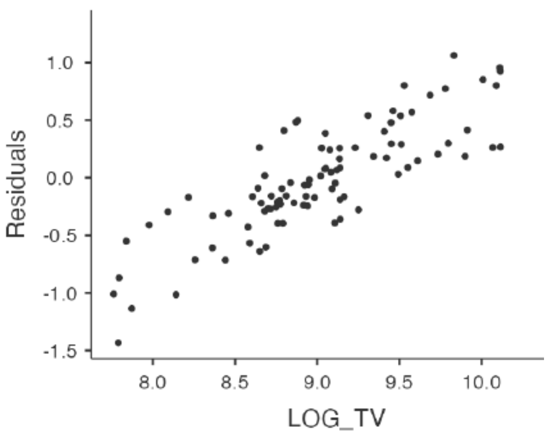


Figure 6. **Residual analysis**

The regression analysis reflects that the proposed model is statistically significant and moderately captures the relationship between the economic performance of companies and some of the GRI indicators present in sustainability reports, which reflect the companies' concerns in this regard.

It is found that there is a positive correlation between the most important predictor, GRI 204 procurement practices, and higher revenues of companies. In addition, there are also positive correlations between the predictors GRI_102 General Disclosures, GRI_206 Anti-competitive Behavior, GRI_304 Biodiversity, GRI_408 Child Labor, and companies with higher revenues, indicating more concern in these areas.

In their sustainability reports, organizations that do not describe anti-corruption policies (GRI_205) or the Rights of Indigenous Peoples (GRI_411) have higher revenues than those that do, which may raise questions about their commitment to anti-corruption practices and respect for ethnic rights.

Therefore, we consider that the regression analysis confirms hypothesis H2. *The company's economic performance, expressed through total revenues, is positively influenced by the procurement policies of companies, expressed through the GRI index in the sustainability report.*

5. Conclusions and limitations

Research suggests that companies with superior sustainability reporting and performance also have better long-term financial performance. However, it is essential to note that there is no direct link between sustainability reporting and financial performance, which can vary depending on the industry and other factors.

Following the analysis of sustainability reporting scores obtained in the three dimensions (economic, environmental, social), it was found that more GRI indexes are reported on the environmental dimension than on the social and economic dimensions. This means that within the policies of companies reflected in sustainability reports, environmental protection concerns are more intense than social and economic ones. Within the organizations that reported within the group, the highest sustainability reporting score was identified in the social and environmental dimensions, a similar conclusion to the study (Venturelli *et al.*, 2017). Organizations that reported locally had the highest score on the economic dimension and the lowest on the social and environmental dimensions.

Regarding the reporting method, it was found that organizations reporting locally have fewer reported indicators than organizations with reports within the group. However, in centrally reported group-level GRI indexes, there may need to be more detail on each entity, which could mask specific policies of group-level firms.

Regarding a company's membership in a group of firms, research has shown that this aspect does not influence companies' sustainability policies. The study identified that aggregate sustainability scores on the economic (T200), environmental (T300), or social (T400) dimensions have a moderate positive impact on two important indicators that measure a company's economic activity: its revenues and expenses, reflecting the results of economic processes and efforts made in this regard.

The study (Cardinali and De Giovanni, 2022) identified several environmental practices (such as eco-friendly packaging, recycling materials, energy-efficient solutions, and innovation in ecological processes) that effectively improve the transition towards responsible digitization.

The net asset indicator, which expresses a company’s value, is positively impacted to a moderate degree by the aggregated sustainability scores on the environmental and social dimensions.

Regarding the integrated approach to sustainability issues, there are high direct links between aggregated sustainability scores on the economic, environmental, and social dimensions, reflecting that firms approach sustainability policies in an integrated, coherent manner.

An important economic indicator, a company’s total income, is positively but moderately influenced by sustainable policies regarding procurement practices, policies on anti-competitive behavior, policies on biodiversity, and policies on child protection about their employability.

References

Amin, M.A., Islam, M. R., & Halim, M.A. (2022) Sustainability Reporting Based on GRI Indicators, *Journal of Sustainable Business and Economics*, vol. 5, no. 1: 1, https://doi.org/10.30564/jsbe.v5i1.2

Broadstock, D.C., Collins, A., Hunt, L.C., & Vergos, K. (2018), Voluntary disclosure, greenhouse gas emissions, and business performance: Assessing the first decade of reporting, *The British Accounting Review*, vol. 50, no.1: 48-59. https://doi.org/10.1016/j.bar.2017.02.002

Cardinali, P.G., & De Giovanni, P. (2022) Responsible digitalization through digital technologies and green practices, *Corporate Social Responsibility and Environmental Management*, vol. 29, no. 4: 984–995, https://doi.org/10.1002/csr.2249

Duran, I.J., & Rodrigo, P. (2018), Why Do Firms in Emerging Markets Report? A Stakeholder Theory Approach to Study the Determinants of Non-Financial Disclosure in Latin America, *Sustainability, vol. 10, no.9:* 9, https://doi.org/10.3390/su10093111

European Commission. (2017). *EUropean Semester Thematic Factsheet Social Inclusion*, available on-line at https://ec.europa.eu/info/sites/default/files/file_import/european-semester_thematic-factsheet_social_inclusion_en_0.pdf

Fujii, H., Iwata, K., Kaneko, S., & Managi, S. (2013) Corporate Environmental and Economic Performance of Japanese Manufacturing Firms: Empirical Study for Sustainable Development. *Business Strategy and the Environment*, vol. 22, no. 3: 187-201. https://doi.org/10.1002/bse.1747

Galant, A., & Cerne, K. (2017) Non-Financial Reporting in Croatia: Current Trends Analysis and Future Perspectives, *Management*, vol. 12: 41-58, https://doi.org/10.26493/1854-4231.12.41-58

Gunawan, J., Permatasari, P., & Fauzi, H. (2022) The evolution of sustainability reporting practices in Indonesia, *Journal of Cleaner Production*, vol. 358: 131798, https://doi.org/10.1016/j.jclepro.2022.131798

Ibáñez- Forés, V., Martínez-Sánchez, V., Valls-Val, K., & Bovea, M. D. (2022) Sustainability reports as a tool for measuring and monitoring the transition towards the circular economy of organisations: Proposal of indicators and metrics, *Journal of Environmental Management*, vol. 320: 115784. https://doi.org/10.1016/j.jenvman.2022.115784

Khoja, F., Adams, J., Kauffman, R., & Yegiyan, M. (2022) How SMEs benefit from environmental sustainability strategies and practices, *Supply Chain Forum: An International Journal*, vol. 23, no. 2: 97-112, https://doi.org/10.1080/16258312.2022.2036580

Korca, B., & Costa, E. (2021). Directive 2014/95/EU: Building a research agenda. *Journal of Applied Accounting Research*, *v*ol. 22, no. 3: 401-422, https://doi.org/10.1108/JAAR-05-2020-0085

Lungu, C.I., Caraiani, C., & Dascălu, C. (2011). Research on Corporate Social Responsibility Reporting. *Amfiteatru Economic Journal*, vol. 13, no. 29: 117-131

Matuszak, Ł., & Różańska, E. (2021) Towards 2014/95/EU directive compliance: The case of Poland. *Sustainability Accounting, Management and Policy Journal*, vol.12, no. 5: 1052-1076, https://doi.org/10.1108/SAMPJ-02-2020-0042

Michalska-Szajer, A., Klimek, H., & Dąbrowski, J. (2021) A comparative analysis of CSR disclosure of Polish and selected foreign seaports. *Case Studies on Transport Policy, v*ol. 9, no. 3: 1112-1121, https://doi.org/10.1016/j.cstp.2021.05.012

Ministry of Justice, National Trade Register Office, & Sindla.com. (n.d.). *Classification of activities in the national economy*. Coduri Caen. Retrieved December 20, 2022, from https://caen.ro

Ministry of Public Finance. (2016) Order Regarding the Modification and Amendment of Some Accounting Regulations No. 1938/2016 of August 17, 2016, *Official Gazette*, *680*, https://static.anaf.ro/static/10/Anaf/legislatie/OMFP_1938_2016.pdf

Nechita, E. (2021). The Value Relevance of Non-Financial Reporting in Determining the Market Value of Equity. *Audit Financiar*, vol. 19, no. 162: 320-336. https://doi.org/10.20869/AUDITF/2021/162/009

Opferkuch, K., Caeiro, S., Salomone, R., & Ramos, T. B. (2022) Circular economy disclosure in corporate sustainability reports: The case of European companies in sustainability rankings. *Sustainable Production and Consumption*, vol. 32: 436-456, https://doi.org/10.1016/j.spc.2022.05.003

Ortiz-Martínez, E., & Marín-Hernández, S. (2020). European Financial Services SMEs: Language in Their Sustainability Reporting. *Sustainability*, vol. 12: 20, https://doi.org/10.3390/su12208377

Perello-Marin, M. R., Rodríguez-Rodríguez, R., & Alfaro-Saiz, J.-J. (2022) Analysing GRI reports for the disclosure of SDG contribution in European car manufacturers. *Technological Forecasting and Social Change*, vol. 181: 121744, https://doi.org/10.1016/j.techfore.2022.121744

The jamovi project. (n.d.). *jamovi - Open statistical software for the desktop and cloud (Version 2.3)* available on-line at *https://www.jamovi.org*

Tiron-Tudor, A., Nistor, C.S., Ştefănescu, C.A., & Zanellatto, G. (2019) Encompassing Non-Financial Reporting in A Coercive Framework for Enhancing Social Responsibility: Romanian Listed Companies’ Case, *Amfiteatru Economic*, vol. 21, no. 52: 590-606

Top companies from Romania. (n.d.), available on-line at https://www.topfirme.com/numar-angajati/

Úbeda-García, M., Claver-Cortés, E., Marco-Lajara, B., & Zaragoza-Sáez, P. (2021) Corporate social responsibility and firm performance in the hotel industry. The mediating role of green human resource management and environmental outcomes, *Journal of Business Research*, *v*ol. 123: 57-69, https://doi.org/10.1016/j.jbusres.2020.09.055

Venturelli, A., Caputo, F., Cosma, S., Leopizzi, R., & Pizzi, S. (2017) Directive 2014/95/EU: Are Italian Companies Already Compliant? *Sustainability*, vol. 9: 8, https://doi.org/10.3390/su9081385

Venturelli, A., Pizzi, S., Caputo, F., & Principale, S. (2020). The revision of nonfinancial reporting directive: A critical lens on the comparability principle, *Business Strategy and the Environment*, vol. 29, no. 8: 3584-3597, https://doi.org/10.1002/bse.2598

SECTION 9 Organizations and society

Assessing the Implementation and Impact of OECD Transfer Pricing Guidelines in SEE Developing Countries: The Case of North Macedonia

Atanasko Atanasovski
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Challenges of Financing Small and Medium Enterprises: Perspectives of Bankers and Business Owners in the UAE

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Assessing the Implementation and Impact of OECD Transfer Pricing Guidelines in SEE Developing Countries: The Case of North Macedonia

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Abstract: **Research questions**: *Do the national legislations of SEE developing countries comply with the arm's length principle and the OECD Transfer Pricing (TP) guidelines?* Motivation: *Multinational companies often structure their intercompany transactions to shift their profits to jurisdictions with favorable tax rates using TP mechanisms. This can lead to discrepancies in the use of inappropriate methods and possible tax manipulations. The OECD offers solutions to reduce such discrepancies.* **Idea**: *This paper aims to assess the compliance of SEE developing countries' national legislations with the arm's length principle and the OECD TP guidelines, with a specific focus on North Macedonia.* **Data**: *Secondary data was collected through a detailed analysis of the OECD TP Guidelines 2022, Country-by-country reporting, national laws and bylaws, and other relevant research literature. Primary data was collected through a survey questionnaire distributed to tax experts in North Macedonia.* **Tools**: *The qualitative research involved a literature review and comparative analysis, while quantitative research involved a survey questionnaire.* **Findings**: *The results show that non-EU countries of the SEE region are making progress in harmonizing their national legislation with the OECD guidelines, but are still in the process of implementing these practices. Businesses in North Macedonia show low awareness and ignorance of TP mechanisms, while tax experts show appropriateness in applying the TP methods. The comparable uncontrolled price method and the transactional net margin method are the most frequently employed methods.* **Contribution**: *Researching TP is crucial because it can uncover possible tax avoidance practices, enhance transparency and equity in international commerce.*

Keywords*: Transfer pricing, OECD, developing countries.*

1. Introduction

Globalization has brought about the dominance of multinational companies in the international market. The complexity of regulating international trade, particularly in developing countries, has led to the widespread use of transfer pricing (TP) tax strategies. The appropriate pricing of intergroup transactions is essential to TP, which involves pricing transactions between and within enterprises under common ownership and control. The OECD (2022) definition provides for TP that occurs when goods and assets are transferred within an organization or as a result of inter-related party services.

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Multinational companies have the tendency to use TP mechanisms to migrate their profits to tax jurisdictions with favorable tax rates, resulting in a reduction of the group's tax liability and public tax revenues in the countries where these companies operate (Hiemann and Reichelstein, 2012). TP is warranted for various reasons, including economic, functional, organizational, and strategic necessities. Nevertheless, TP is a highly debated and challenging topic in the context of multinational corporations (Göx and Schiller, 2006), and it has become one of the most controversial and complex topics in the field of accounting, finance, and tax consulting. Despite rising geopolitical tensions and Covid-19 consequences, global trade has proven to be remarkably resilient during 2022, reaching a record US$ 32 trillion (UNCTAD, 2023). According to the UNCTAD (2023) report, trade in goods was about US$ 25 trillion (10% increase from 2021), and trade in services was about US$ 7 trillion (15% increase from 2021). Multinationals use TP to manage their taxable profits through pricing intercompany transactions, which poses challenges to tax authorities and leads to tax base erosion and profit shifting. Tax authorities are obliged to implement appropriate control over TP to prevent tax evasion, as well as possible double taxation. Such control is complicated for the national tax authorities because they often do not have complete and accurate information about related parties and their mutual companies, nor can they reliably assess the objectivity of the TP at which an intercompany transfer is made if such information is available.

The Organization for Economic Co-operation and Development (OECD) recognized these discrepancies, and through the "arm's length" principle and methods for determining TP offers a solution to possible tax manipulations (OECD, 2022). TP issues are more pronounced in developing countries due to the lack of institutional capacity, inadequate resources, and limited expertise. North Macedonia is a developing country located in Southeast Europe (SEE). It has experienced significant economic growth over the last two decades, with foreign direct investment playing a significant role in the country's economic development. In 2019, the Macedonian government adopted the OECD TP Guidelines, signaling its commitment to addressing TP issues in the country (Ministry of Finance, 2019).

Despite its recent emergence as a corporate strategy, limited literature exists on the TP matters. Therefore, this paper aims to assess the implementation and impact of OECD TP guidelines in developing countries, through the case of the Republic of North Macedonia. All countries from Southeast Europe that are not EU member states have an aspiration to become a member of the EU and are actively working on harmonizing national legislation with good European practices. The main research objective is to perceive the compliance of developing countries' national legislation with the arm's length principle and the OECD TP guidelines.

- A1: The expected result is that the respective countries, although not part of the OECD, have for the most part transposed the OECD TP guidelines into national law.
- A2: Given the recent implementation of the TP Rulebook in North Macedonia, coupled with mandatory TP reporting requirements, it is likely that businesses and tax experts responsible for preparing TP reports may lack familiarity with the intricacies of TP and may not have adequate guidance from OECD practices.

The paper is organized into several distinct sections. Firstly, a brief introduction and overview is provided on the significance of TP. The literature review section presents the most significant research findings and current state of TP at a global level. A separate section is dedicated to presenting the results of a comparative analysis of the compliance of national legislation with the OECD guidelines in selected developing countries from SEE region. Next, the paper outlines the research methodology and presents the results and discussion of the research conducted in North Macedonia. Finally, a summary of the most significant findings and conclusions from the research on TP is presented in the last section.

Conducting research on TP is important as it helps to identify potential tax avoidance practices, promote transparency and fairness in international trade, and ensure that countries receive their fair share of tax revenue.

2. Literature review

According to Li (2005), TP is used in the case of the transfer of goods or services between subunits or profit centers within the same corporation, located either within the territory of one country or in different countries.

As the world economy grows and becomes increasingly interconnected, numerous national fiscal authorities are searching for better methods to safeguard their tax revenues (Holtzman and Nagel, 2014). According to these authors, multinational corporations are seeking guidance on how to handle the greater regulation and scrutiny they are facing. This includes complying with complex TP rules, meeting stringent documentation requirements, navigating sophisticated auditing processes, and facing substantial penalties for failing to comply. As a suggestion Holtzman and Nagel (2014) state that tax professionals can help companies manage their TP issues through four primary areas: (1) Planning, (2) Compliance and documentation, (3) Implementation, and (4) Various services that help resolve TP disputes, including assistance with advance pricing agreements (APAs), competent authority negotiations, arbitration, and litigation support.

According to Yao (2013); Klassen, Lisowsky, and Mescall (2017), and Davies *et al.* (2018) research has revealed that the use of TP by many organizations has allowed them to transfer their profits from countries with high taxes to countries with lower taxes. They state that TP can be subject to unethical and unlawful exploitation, for example, to reduce global tax, whereby revenue and costs are manipulated in ways to show maximum and minimum profits in low-tax and high-tax countries, respectively. Over and under-invoicing in TP transactions are the most common methods for achieving this, as stated by Davies *et al.* (2018) and Sari *et al.* (2020).

Business conglomerates and multinational enterprises may have an administered or negotiated TP depending on their company policies (Liu, Zhang, and Tang, 2015). In order to ensure that intra-organizational transactions within the same group of companies charge a TP that is comparable to what unrelated companies would charge, governments rely on a method known as “arm’s length pricing” (Yao, 2013).

Kumar *et al.* (2021) conducted a bibliometric analysis of 735 TP research articles from the Scopus database, covering a period of over 50 years (1968-2019). Their research yielded several important findings, including the following (Kumar *et al.*, 2021): (1) it is crucial for scholars to use a diverse range of methodologies beyond game theory, such as simulations, mathematical modeling, machine learning, and experimental and field survey data; (2) the impact of leadership and organizational culture on costing and pricing practices in TP has been largely overlooked in the literature; (3) although there is a significant body of research on arm's length pricing, there is no comprehensive bibliometric or systematic literature review specifically focused on TP; (4) TP should be viewed as a strategic tool for planning, production, and revenue management rather than simply a means of avoiding taxes, and (5) given the constantly evolving domestic and international business environment, the field of TP will continue to be an intriguing and exciting area of study for scholars, practitioners, and policymakers.

Rogers and Oats (2022) conducted research on TP with special reference to the arm's length principle (ALP) through a total of 34 interviews conducted in 2 rounds of 17 interviews each. The first round was carried out in 2006/07, and the second round was carried out in 2016/17 in order to perceive the perspective of senior TP professionals during two periods with extremely different conditions. The results of the research of Rogers and Oats (2022) were that the expertise and the struggle for dominance in the TP market are increasing; each case of TP determination differs in some way from another (due to the conditions and environment) and it is very difficult to directly compare practical use-cases in different jurisdictions and different multinational companies; respondents in the period 2006/07 spoke positively about the ALP, where they suggested its flexibility as a key advantage of the ALP, while respondents in the period 2016/17 pointed out that it is increasingly challenging to apply the ALP. Findings from fieldwork support the proposition that TP experts adapt to changes at the field level by changing their view of ALP as the only reasonable mechanism for allocating taxable profits between jurisdictions (Rogers and Oats, 2022).

To ensure objectivity and fairness in taxation, it is necessary to establish unified tax treatment of TP at international level which national tax administrations would apply and adhere to (OECD, 2022). The problem faced by multinational companies is the fact that they have to prepare TP documentation adapted to the needs and requirements of the tax jurisdiction in which they perform economic activities and make a profit. Since multinational companies operate in different countries that have special rules and requirements for the structure and content of TP documentation, multinational companies must prepare separate TP reports for each tax administration, making the process of TP extremely difficult and high costly. For this reason, international organizations (such as the OECD) specified certain recommendations and guidelines for defining the structure and content of TP documentation, which would simplify the process of creating this documentation and unify it to a certain extent at the international level (OECD, 2022). In 1995, OECD published the "Transfer Pricing Guidelines for Multinational Companies and Tax Administrations", which today represent generally accepted international framework for the treatment of TP. These guidelines define the arm's length principle as a basis for determining TP, specify the TP methods based on the arm's length principle, provide rules and recommendations for compiling TP documentation, i.e., report, and list other TP recommendations and guidelines. When testing the compatibility of a transaction between related parties with the arm's length principle, it is necessary to answer the question: "What would be the price that the two companies would set, if they were independent?" (Eden, 2009).

The most recently adopted OECD (2022) guidelines list the following methods as applicable: the comparable uncontrolled price (CUP) method, the cost-plus method and the resale price method which together constitute the traditional transaction methods. Furthermore, the transactional net margin (TNM) method and the profit split method which are classified as transaction profit methods.

In addition to the OECD guidelines, in June 2006 the Council of the European Union approved the Code of Transfer Pricing Documentation for Related Enterprises in the EU (EUTPD). The aim is to simplify and standardize the TP documentation that multinational companies operating in the territory of the EU must compile and present to the tax administrations of the EU member states, on the basis of which the compliance of TP with the arm's length principle is evaluated (EU Commission, 2005). The EUTPD has to some extent paved the way for a single standardized TP documentation in the EU. However, the problem that exists with multinational companies is that many of them operate not only in the EU, but also outside it where the EUTPD is not accepted, and the problem of duplication costs of creating documentation is still present.

According to the one of the most recent research conducted by Perčević (2015) on the compliance of the EU countries with the OECD manual obtained the following findings:

- All EU countries, except Malta, apply the OECD TP guidelines as the relevant standard for TP regulation and control.
- 67% of the EU member states have directly included the OECD Guidelines in the legal framework, 29% of the countries have included these guidelines indirectly, while only 4% of the countries have not included the guidelines in their legislation at all.
- The majority of member countries (63%) do not have defined priority methods for determining TP, while 37% have prioritized traditional methods. Generally, the preferred methods are the CUP method as well as other traditional methods (cost plus method and resale price method), while the TNM method and the profit split method can only be applied if it is not possible to apply any of the traditional transaction methods.

According to the study on the regulatory framework of TP in the countries of the EU, Perčević (2015) concluded that in these countries there is a high degree of conformity of the institutional framework of TP.

On 18 November 2022, Malta published subsidiary legislation implementing formal TP Rules, aligning with current global standards, adopting the arm's length principle as of 1 January 2024 (KPMG, 2022). These rules are based on the OECD TP Guidelines and are designed to align Malta's TP regulations with international best practices.

3. Comparative analysis of the national legislation of SEE non-EU countries with the OECD guidelines

The concept of TP is not novel, but it is still a topic of active research among scholars. There is a particular focus on investigating various aspects, including TP schemes, the implementation of TP regulations, and the impact of TP in developing countries (Mashiri, 2018).

The OECD TP methods have been developed to assist multinational companies and national tax authorities in determining and controlling TP for tax purposes and are consistent with the arm's length principle. The goal when choosing a particular TP method is to find the most appropriate method for a specific case. For this purpose, the selection process should take into account the respective advantages and disadvantages of the methods recognized by the OECD; the appropriateness of the method being considered given the nature of the controlled transaction; the availability of reliable information that is needed for the application of the chosen method and/or other methods; degree of comparability; functions performed, risks assumed, and assets used. No single method can be appropriate for every possible situation, nor is it necessary to prove that a particular method is not appropriate in the particular circumstances (OECD, 2022).

It is considered that the traditional transaction methods allow to determine in the most immediate way whether the conditions within the commercial and financial relations between the related parties are in accordance with the arm's length principle. On the other hand, in certain situations it can be concluded that transactional profit methods are more appropriate than traditional transactional methods. For example, in cases where each of the parties to the transaction contributes in a way that is valuable or unique in relation to the controlled transaction or the activities carried out by the parties are highly integrated, the application of the transaction profit split method is considered more appropriate than the application of a traditional method. In situations where there is no publicly available and reliable information on third party gross margins or access to the information is limited, it may be difficult to apply traditional transactional methods unless internal comparable exist (OECD, 2022). Finally, multinational enterprises retain the freedom to apply methods not described in the OECD Manual to determine prices, but provided that those prices are consistent with the arm's length principle, as provided for in the Guidelines.

The term Southeast Europe (SEE) is used to describe a geographical and political region, consisting primarily of the Balkans. For the purposes of this analysis, several selected countries, which are not EU members, are included. The reason for this selection is the economic differences between exempted and targeted countries. EU member countries have a completely different approach to legal, political, and economic issues compared to other countries in the SEE region.

The conducted comparative analysis of TP in selected developing countries is shown in table 1.

Table 1. **Comparative analysis of TP in developing countries**

Country	Compliance with the arm's length principle	Compliance with OECD TP Guidelines	OECD TP methods	Hierarchy of TP methods
Albania	**Yes** Article 36/1 of the Profit Tax Law and Article 4/1 of the TP Directive	**Yes** Article 2 of the TP Directive	5 OECD TP methods	**No**
Bosnia and Herzegovina*	**Yes** Article 46 of the Profit Tax Law in the	**Yes** Article 44-46 of the Profit Tax Law in the	5 OECD TP methods	**FBH – No** **RS – Yes**

Country	Compliance with the arm's length principle	Compliance with OECD TP Guidelines	OECD TP methods	Hierarchy of TP methods
	FBH and Article 9 of the Profit Tax Law RS	FBH and TP Regulations, and Article 31-34 of the Profit Tax Law in the RS and TP Regulations		(CUP method is preferred)
Kosovo	**Yes** Article 27/2 of the Profit Tax Law and Administrative Instructions on TP	**Yes** Administrative Instructions on TP	3 OECD TP methods	**Yes** (CUP method is preferred)
Moldova	**Yes** Moldovan tax law has included the arm's-length principle since 1998 (PwC, 2013).	**No****	**No** OECD TP methods mentioned	**No**
Montenegro	**Yes** *Article 38 of the Profit Tax Law*	**Yes** Built into the legislation, but no specific regulations have been published yet. Taxpayers are advised to follow OECD guidelines	5 OECD TP methods	**No**
North Macedonia	**Yes** *Article 12 of the Profit Tax Law*	**Yes** *Article 12, 12-a, and 12-b of the Profit Tax Law, the Customs Law, Law on Trade Companies, and TP Rulebook*	5 OECD TP methods	**No**
Serbia	**Yes** *Article 60 and 61 of the Profit Tax Law*	**Yes** *Article 61.a of the Profit Tax Law and The TP Regulations*	5 OECD TP methods	**No**

*Bosnia and Herzegovina is divided into two autonomous federal entities: Federation of Bosnia and Herzegovina (FBH) and Republika Srpska (RS).

** Moldova recently formally introduced its first TP regulations, which follow the OECD's TP Guidelines through Law no. 356, dated 29 December 2022, which introduce general rules related to TP reporting and documentation requirements (PwC, 2023). The legislation enters into force on 1 January 2024.

According to table 1, the following conclusions can be reached:

- The tax legislations of all of the analyzed countries refer to the arm's length principle or at least express the obligation of related companies to fix the prices of their intercompany transactions at market price;
- All of the analyzed countries (directly or indirectly) have mentioned and are guided by the OECD TP Guidelines in their local legislation;

- Among the analyzed countries from SEE, there are differences in the way of using TP methods for price determination in accordance with the arm's length principle;
- The legislation of Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia specifies all five TP methods that are in accordance with the OECD Guidelines ((1) Comparable uncontrolled price - CUP; (2) Resale Price; (3) Cost plus; (4) Transactional net margin - TNM, and (5) Profit split)
- Generally, there is no priority among the accepted methods, except in Republika Srpska and Kosovo, where the CUP method is preferred, and there is no restriction for using another method that can calculate the price according to the arm's length principle;
- In the relevant legislation of Kosovo, only the three traditional TP methods are mentioned, where the CUP method has priority;
- In Moldova currently there is no TP method mentioned in the legal regulation, but in practical cases the tax authorities apply the CUP method (Graci, 2014).
- The Macedonian legislation now follows OECD guidelines for choosing TP methods. However, the current 2019 TP Rulebook provides inadequate guidance on applying these methods and lacks practical examples. As a result, when preparing TP reports, entities may turn to the OECD Rulebook for specific guidance. With increased globalization and the emergence of multinational corporations, there is a growing trend in North Macedonia for companies to prepare TP reports. In 2019, the Ministry of Finance made the TP report mandatory for eligible companies to harmonize with EU practices. While North Macedonia is still in the process of implementing OECD guidelines, it is worth noting that audit firms are the only ones that have the appropriate resources with which to conduct valuation and TP analysis. So, most of the TP reports are prepared by tax experts and advisors, employed by audit firms.

4. Research methodology

To conduct a thorough analysis of TP in North Macedonia, we utilized a structured survey questionnaire distributed electronically to tax experts, who are primarily responsible for preparing TP documentation and reports. Our research population consisted of all active audit firms in North Macedonia, as publicly available data on which companies are obligated to prepare TP reports is limited. Additionally, tax consultants and experts are mostly concentrated in audit firms, which is why we chose this population. The audit firms, particularly the Big Four and other international networks, are the only ones equipped with the appropriate resources to carry out a valuation analysis and determine TP.

Our sample size matched the entire population of 28 active audit firms in North Macedonia, divided into three groups: companies that are members of the Big Four, members of the international network, and local audit firms (CAOA, 2022). We obtained information on the selection of the population from the official website of the Council for Advancement and Oversight of the Audit of the Republic of North Macedonia - CAOA.

The survey questionnaire comprised 34 structured questions, including inquiries related to the respondents' characteristics, "yes" and "no" questions, matrix questions, 5-point Likert scale questions (ranging from 1 - strongly disagree to 5 - strongly agree), and short answer text questions. Our research questionnaire was formulated by integrating inquiries addressed in the studies conducted by Rogers and Oats (2022), Perčević (2015), and subsequently tailored to suit the specific circumstances in North Macedonia.

To attain the established objectives and confirm or reject the previously set assumptions (A1, and A2) about North Macedonia, our research encompassed five main areas of inquiry (research questions), namely:

- RQ1*: What is the frequency of method usage within TP reports, and which TP method is most frequently employed?*
- RQ2*: Which is the simplest TP method according to tax experts?*
- RQ3*: What is the preferred TP method according to the transaction type?*
- RQ4*: What is the level of North Macedonia's compliance with OECD guidelines?*
- RQ5*: What is the level of familiarity and awareness among tax experts and business concerning TP?*

Our survey was carried out between November 2022 and January 2023 and received responses from 20 tax experts affiliated with a total of 15 audit firms. The response rate is 54%.

A recent study by Bozhinovska-Lazarevska *et al.* (2022) revealed that the audit market in North Macedonia is characterized by a range from perfect competition to oligopoly, indicating that it is a no concentrated market. Unlike developed EU countries, where the Big Four audit firms dominate the market, Macedonian audit market is relatively more diverse. Consequently, the responses received from tax experts employed in audit firms of varying sizes are representative and can serve as a good basis for obtaining preliminary findings about the state of TP in North Macedonia.

5. Results and discussions

The questionnaire was answered by experienced tax experts, with 50% of the respondents possessing more than 10 years and 25% possessing more than 5 years of work experience in the field of accounting, auditing, and tax consulting. Furthermore, 55% of the participants have more than 3 years and 15% have more than 5 years of experience in the field of TP.

Table 2 presents information about the structure of the audit firms where the respondents are employed, their participation, and the number of prepared TP reports (before and after TP reports have become mandatory).

Table 2. **Affiliation of tax experts and their role in preparing TP reports**

Audit firm classification	Percentage participation in the sample	Percentage participation in TP reports preparation	Number of TP reports prepared before 2019	Number of TP reports prepared in the period 2019-2022
Big Four	25%	100%	21	253
International network	50%	90%	12	152
Local audit firm	25%	40%	1	19
TOTAL	***100%***		***34***	***424***

Out of a total of 20 respondents, five respondents are employed in an audit company that is part of the Big Four, 10 respondents are employed in an audit company that is part of an international network, while the other five respondents are employed in local audit firm. Only 20%, that is, four respondents have not prepared a TP report so far. Table 2 shows that the tax experts who have not prepared a TP report so far are almost all from local audit firms, i.e., three out of five respondents and only one out of 10 respondents from an audit firm that is part of an international network. In contrast, all the respondents employed in the Big Four audit firms had prepared TP reports. These results are logical, given that the software required to perform the TP study is expensive and local audit firms cannot afford it, nor do they have the appropriate clientele that is required to prepare TP reports.

The respondents were asked whether they have prepared TP reports before 2019, that is, before the legal provision of the Ministry of Finance. Of the total number of respondents, 65% declared that they had not prepared such a report, while 35% declared that they had. The total number of TP reports before 2019 is 34 and is drastically less compared to the period after 2019, after TP reports are mandatory. The total number of reports prepared by the examined tax experts for the period of 2019 to 2022 is 424, so the larger numbers of reports were prepared by the representatives of the Big Four with a total of 253 reports (59.67%). The respondents employed in audit firms that are part of an international network have prepared 152 reports (35.85%) and finally, the employees of local audit firms have prepared 19 reports (4.48%).

In order to ensure that responses are meaningful and suitable for subsequent analysis, the test of consistency in tax experts' responses was conducted, shown in table 3.

Table 3. **Reliability statistics**

Cronbach's Alpha	No. of items
.748	27

The tax experts' responses have a high level of consistency as indicated by Cronbach's alpha value of 0.748. Thus, the results are reliable, and relevant conclusions can be drawn from them. In the consistency test, 5 questions related to the characteristics of the respondents and 2 short answer questions were excluded.

5.1. Findings on TP method usage (RQ1) and tax expert opinions on simplicity (RQ2)

To elaborate on the frequency of method usage within TP reports, a question was asked about the frequency of the used method in the total number of prepared TP reports, where the given answers were intervals in absolute numbers: 0-5, 5-10, 10-20, 20-30 and over 30 reports. The results are shown in Figure 1.

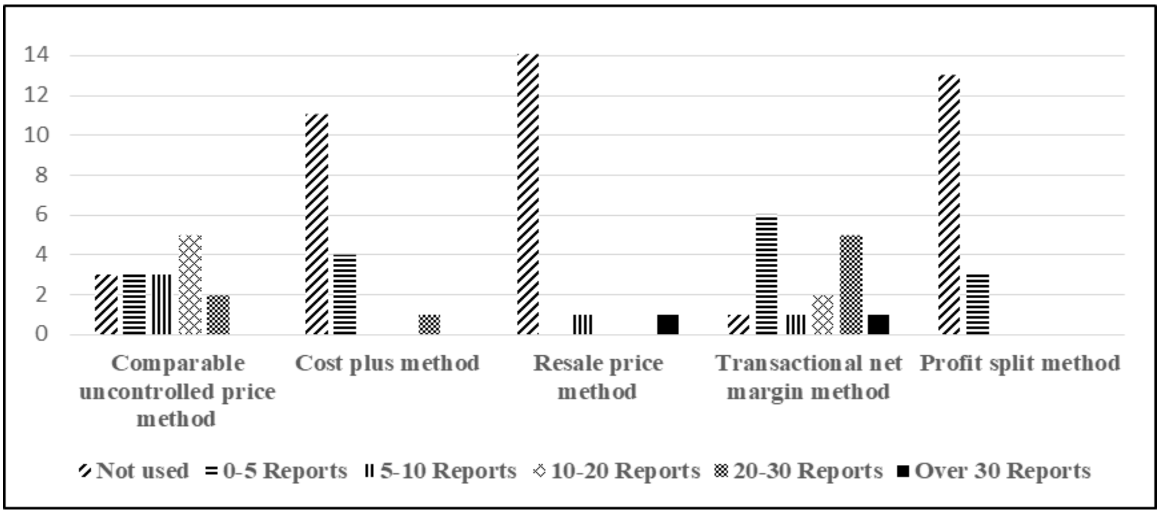

Figure 1. **Frequency of use of the TP methods**

The CUP method according to the answers of the respondents is most represented in the interval of 10-20 reports with a total of 5 answers for this interval. This method is represented in a small number of respondents' reports, considering that only two respondents answered that it is represented in an interval of 20-30 reports. The use of the cost-plus method is at an unenviable level, considering that 11 respondents answered that they did not use this method at all, 4 respondents answered that this method is represented in an interval of 0-5 reports, while only one respondent has used this method in an interval of 20-30 TP reports. Similar to the cost-plus method, the resale price method is insignificantly used. 14 respondents answered that they had not used this method at all, while in an interval of 5-10 and over 30 reports, one respondent used it respectively. The TNM method is the most used, considering that 6 respondents used this method in the interval 0-5 of the total number of reports, 5 respondents used this method in the interval 20-30, 2 respondents used it in the interval 10-20 reports, while 2 respondents (1 each) used it in the intervals of 5-10 and over 30 reports. Only 1 respondent, who prepared TP reports, did not use this method at all.

According to the respondents, it can be concluded that the profit split method is the least used. This is due to the complexity of the calculation of this method, as well as the fact that the profit split method is prohibited for use in certain countries because it is considered inconsistent with the arm's length principle.

The following Figure 2, presented below, shows the results for the most frequently employed and the simplest TP method according to the respondents.

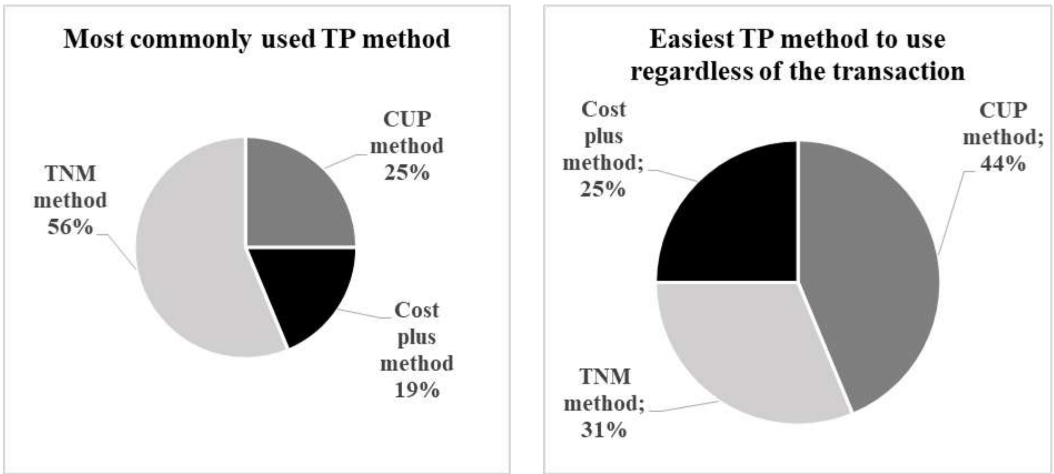

Figure 2. **The most frequently employed and the simplest TP method**

In Macedonian practice, the TNM method reigns supreme as the most frequently employed TP method in reports, with 56% of practitioners deeming it the most practical. The CUP method follows closely behind as the second most commonly used technique, with a usage rate of 25%. The cost-plus method takes third place in popularity, with 19% of practitioners utilizing it. Conversely, the resale price and profit split methods are the least used, with a usage rate of 0%. The correspondents' answers about which are the simplest TP method to use, regardless of the type of transaction being tested, are as follows: (1) CUP method - 44%, (2) TNM method - 31%, and (3) cost plus method - 25%. It can be seen that although the majority of tax experts consider that the CUP method is the easiest to use, it is still not the most used method in practice so far.

5.2. Analysis of TP method representation by transaction type (RQ3)

According to the OECD Guidelines, if the CUP method and another TP method can be applied in an equally reliable manner, the CUP method is to be preferred. The resale price method is most appropriate for marketing services. The cost-plus method is most appropriate for sales of semi-finished goods, where the related parties have entered into joint facility agreements or long-term purchase and supply agreements, and for transactions related to services. The TNM method is suitable for all types of transactions and much more practical than traditional TP methods. This is based on the fact that the TNM method is based on indicators of net profit and is called a two-sided method, which means that both sides of the transaction are tested. The profit split method is recommended to be used for highly integrated operations such as global trading of financial instruments. Furthermore, this method may be found more appropriate in cases where both parties make unique and valuable contributions to the transaction (e.g., unique intangible assets). According to the arm's length principle, when both the traditional transaction method and the transaction profit method can be applied in an equally reliable manner, the traditional transaction method is preferred. However, it is important to note that even though OECD gives the base guidelines for using the TP methods, it is not possible to provide specific rules as a result of the specificity of each specific transaction that is the target of TP analysis. The following charts starting from 3-1 to 3-5 refer to the representation of TP methods in North Macedonia according to the type of transactions. The types of transactions are divided into the following categories, according to the examples in the OECD guidelines: (1) finished goods, (2) trading goods, (3) financial services, (4) intangible assets, (5) services, and (6) other types of transactions.

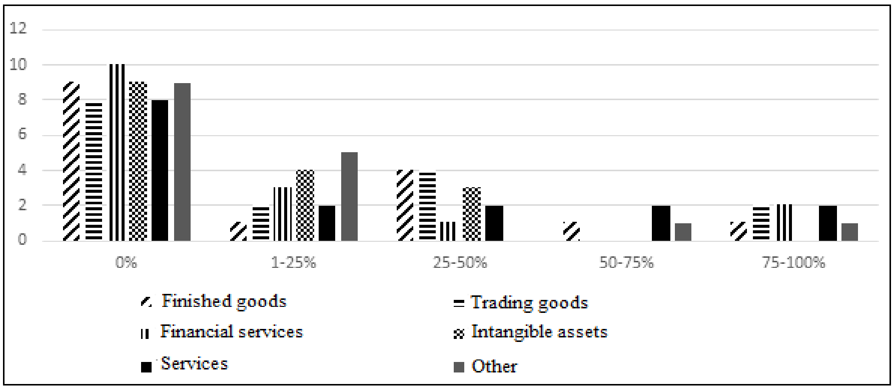

Figure 3-1. **Representation of the CUP method according to the type of transaction**

Figure 3-2. **Representation of the cost-plus method according to the type of transaction**

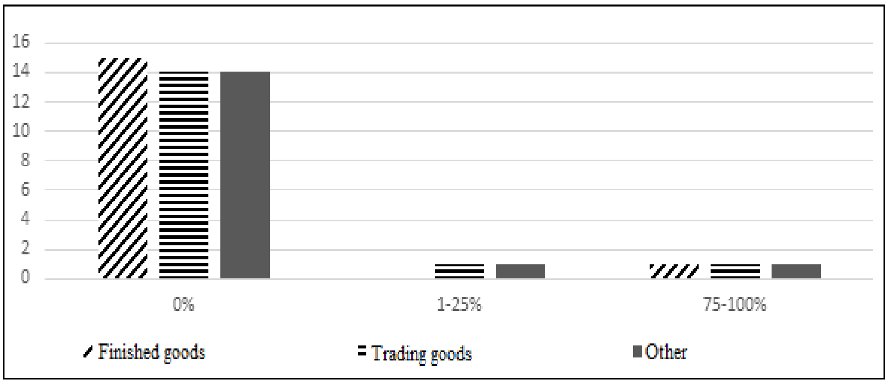

Figure 3-3. **Representation of the resale price method according to the type of transaction**

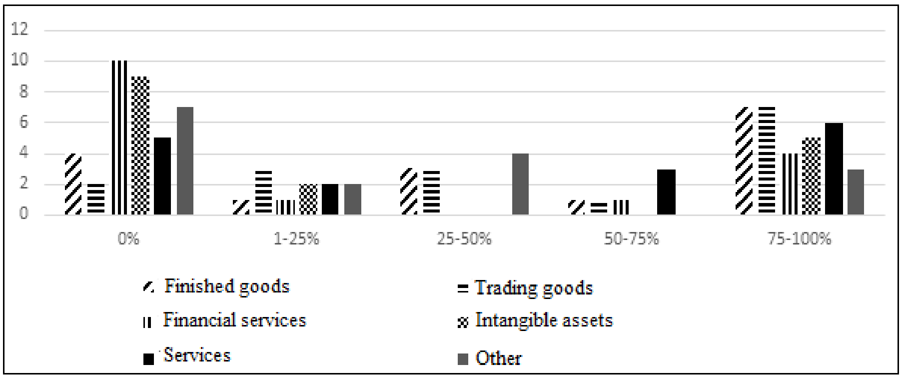

Figure 3-4. **Representation of the TNM method according to the type of transaction**

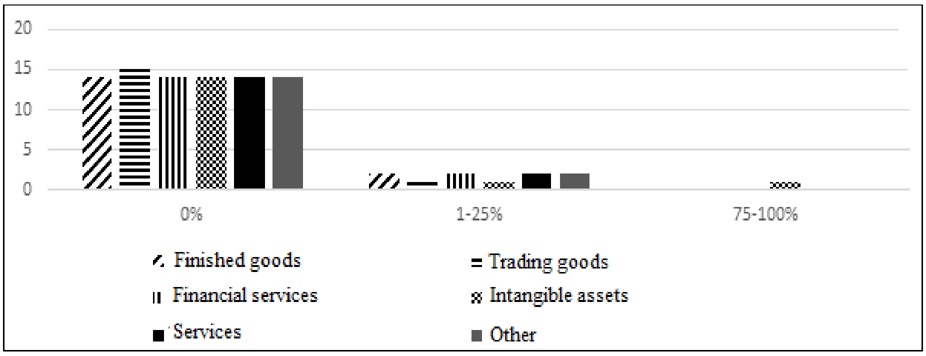

Figure 3-5. **Representation of the profit split method according to the type of transaction**

It can be seen that there are differences in the application of the methods in different types of transactions. It is a good result because it indicates that tax experts are guided according to the OECD guidelines and choose the appropriate TP methods in a given situation, i.e., when analyzing a given type of transaction. The representation level was divided into percentage intervals. In TP reports, the CUP method is underrepresented, and it is commonly used for transactions related to financial services, services, and "other" intercompany transactions. This can be attributed to the method's complexity, which requires reliable data that tax experts often lack, leading to logical answers that may not always be feasible. It can be seen that the representation of the cost-plus method prevails in the transactions with finished goods, which is in accordance with the OECD guidelines. The results obtained for the resale price method point to the fact that tax experts are insufficiently informed about this method. There is a low representation in each of the types of transactions, as well as inappropriate use of it in transactions with finished goods and other types of transactions, rather than in transactions with trading goods. It is confirmed again that the TNM method is the most used, especially in transactions related to intercompany sales of finished and trading goods, while it is the least used in financial services. The predominant answers are that the profit split method is not used at all for any type of intercompany transaction.

In this regard, the respondents were asked if due to insufficient or limited access to data they were in a situation to choose a TP method that is not the most appropriate for the given transaction being tested, 38% of the respondents answered "yes", while 63% answered "no".

5.3. Examination of North Macedonia's adherence to OECD guidelines (RQ4) and the familiarity level among tax experts and businesses regarding TP (RQ5)

When asked about the use of the OECD Guidelines when preparing TP reports, 94% or 15 respondents answered "Yes", while only 6%, i.e. 1 respondent answered "No". The reasoning of this respondent is as follows:

> *"During the preparation of TP reports, the domestic legislation and the TP Regulations (as a by-law of the Profit Tax Law) are used. The OECD guidelines are used additionally because there are no detailed guidelines as by-laws in our legislation. However, North Macedonia is not part of the OECD and is not obliged to use them."*

It can be noted that although the answer is "No", this respondent also used the OECD Guidelines. Generally, from the conducted questionnaire, it can be concluded that in North Macedonia there is a high degree of compliance in the practical application of TP methods by the guidelines laid out in the OECD manual. This indicates a high degree of knowledge of TP and the methodology for their determination among tax experts, as part of the audit firms affiliated with the Big Four and other international networks.

Other key findings that have been reached according to the answers received from the surveyed tax experts in North Macedonia are:

- 70% of respondents partly and strongly disagree that the business sector in North Macedonia is sufficiently familiar with and aware of the TP matters. Thus, can be concluded that the businesses in North Macedonia are still characterized by low awareness of the meaning and importance of TP. In this regard, it is important to note that 90% of respondents indicate that the Public Revenue Office, which is one of the most affected parties in intercompany transactions of multinational companies, did not ask businesses for any data on these transactions before the legal provision in 2019.
- 85% of respondents partly and strongly agree that TP is a current topic, especially after 2019 when TP reports became mandatory in domestic practice;
- 60% of the respondents indicate that the current guidelines for preparing the TP report in the Macedonian legislation are not comprehensive and sufficient, 30% are neutral, and only 10% consider that they are in order.
- 80% of the respondents believe that increased governmental control would contribute to greater interest on TP in the business sector.
- Most of the respondents especially refer to better education of employees in public institutions as well as more precise legal and bylaws.

The short answer questions showed the dissatisfaction of the surveyed tax experts towards the current guidance of public institutions related to this matter. The following recommendations can be singled out as more significant:

> R2: "*Education of the Public Revenue Office employees because they do not understand the problems related to TP*".

> R7: "*Increasing the controls on submitted TP reports*".

R12: "*Alignment of the TP report delivery deadline with the tax balance delivery deadline*".

R14: "*Amendments/additions to the Rulebook on the form and content of the TP report, the types of methods for determining the price of the transaction by the arm's length principle, and their application*".

R15: "*Detailed regulations on the method of calculation of TP and appropriate tax base if a difference is found; training for the management and owners of the companies on the responsibility in this matter; greater communication of the Public Revenue Office with legal entities, accounting, and audit firms*".

R17: "*The governmental bodies should make international databases available to companies by subsidizing the subscription to access them*".

6. Conclusions

With the emergence of globalization, multinational corporations have become dominant players in world markets. As a consequence of this trend, their intercompany transactions are growing exponentially and breaking down traditional border barriers. To minimize tax liability, many of these corporations use TP, which involve shifting profits to related companies operating in countries with lower tax rates. To safeguard public revenues in the countries where these profits are generated, it is crucial to establish regulations that ensure fair TP practices.

The OECD guide provides essential guidelines for objectively valuing TP. The "arm's length" principle favors traditional transactional methods for determining TP due to their reliability. However, restricted access to relevant data can hinder the implementation of these methods. As a result, any TP method may be permitted if it is agreed upon by all members of the multinational enterprise involved in the transaction and the tax administrations in all relevant jurisdictions. This approach acknowledges the challenges posed by limited access to data and seeks to promote a fair distribution of profits across all stakeholders.

The paper contains an extensive analysis of the compliance of developing countries' national legislation with the arm's length principle and the OECD TP guidelines with special reference to North Macedonia through research conducted with tax experts.

EU member states are distinguished by a high degree of compliance of the national legal regulations with OECD guidelines.

From the conducted comparative analysis, it can be concluded that the non-EU countries of SEE region, as developing countries, are well on their way to harmonizing the national legislation, but are still in the process of implementing the practices and guidelines of the OECD. The results confirmed our assumption (A1) of almost complete compliance of SEE developing countries' national legislation with the arm's length principle and the OECD TP guidelines.

In North Macedonia, the TP rulebook issued in 2019 by the Ministry of Finance, has covered all the key points of the OECD guidelines and represents a good starting point for further development of the TP regulation, however the guidance needs to be supplemented and expanded. The perceptions of the tax experts indicate that the Macedonian business sector is not sufficiently familiar with the importance of TP. This is the result of the low representation of governmental regulation, as well as insufficiently detailed legal provisions. On the other hand, tax experts show a high degree of knowledge of the guidelines for determining TP. The results partially confirmed our assumption (A2) about the low awareness and ignorance of the complexity of TP, but not among tax experts, who show appropriateness in applying the methods according to the OECD TP guidelines.

The research showed that the most used methods for determining TP are the TNM method and CUP method, which shows that the worldwide relevance of these methods is mirrored in North Macedonia as well.

Recommendations from tax experts to improve TP control in North Macedonia are more active monitoring of transactions between related companies and greater control of TP reports, implementation of a more adequate and precise institutional framework, and increased training for TP in the Public Revenue Office and other governmental bodies.

The implementation of a more accessible database for related enterprises at the state level is also of essential importance, which would enable greater actuality of traditional transactional methods, which are considered more accurate and more reliable than transactional profit methods.

The biggest limitation in the research comes from the limited public information about the companies that are subject to TP reporting, the list of tax experts in North Macedonia, and the coverage of the survey study which is concentrated to tax professional working in audit firms in the country. It is important to highlight that the existing literature and recent research lack comprehensive exploration of current challenges, obstacles, and recommendations, particularly in collaboration with tax experts and TP professionals. The lack of previous research and findings on TP conditions and perspectives in North Macedonia presents a limitation when it comes to comparing with previous results and building upon the findings identified by tax experts. Our research, as the first of its kind in North Macedonia, produces promising preliminary results that establish a solid groundwork for future comprehensive investigations. This paper contributes to the literature on the relevant matter, which is increasingly important and popular. North Macedonia, along with other countries from the Balkans and the SEE region, is a developing country that claims EU membership. Considering this context, we believe that the findings of our research and this type of studies should be extended to other countries, both EU and non-EU countries, as well as OECD members and non-OECD members. In future research, we plan to focus our survey to examine the influence of various economic, political, social, legal, external, and internal factors on the choice of method for determining TP. Our aim and recommendation for future studies involve expanding the country sample and conducting more extensive research on the positive and negative practices, particularly in relation to the differentiation between EU and non-EU member states. In addition, future research should be directed toward the analysis of foreign practices for the implementation of databases, which would enable overcoming the data barrier faced by tax experts.

References

Bozhinovska-Lazarevska, Z., Dionisijev, I., Tocev, T. & Malchev, B. (2023) „Audit Market Concentration: Some Evidence from the Republic of North Macedonia", *Contemporary Financial Management Conference Proceedings*, vol. 1: 79-93, Lex Loxalis. https://doi.org/10.4335/2023.3.6

CAOA. (2022) „Licensed audit firms", available on-line at https://sunr.mk/liczenczirani-drushtva-za-revizija/ (November 1, 2022)

Davies, R.B., Martin, J., Parenti, M., & Toubal, F. (2018) "Knocking on tax haven's door: Multinational firms and transfer pricing", *Review of Economics and Statistics*, vol. 100, no. 1: 120-134

Eden, L. (2009) „Taxes, Transfer Pricing and the Multinational Enterprise", in: Rugman, M. A. (2009) "The Oxford Handbook of International Business", 2nd edition, Oxford Academic, pp. 591-620. http://dx.doi.org/10.1093/oxfordhb/9780199234257.003.0021

EU Commission. (2005) „Code of Conduct on transfer pricing documentation in the EU - Frequently Asked Questions", available on-line at https://ec.europa.eu/commission/presscorner/detail/en/MEMO_05_414 (March 16, 2023)

Göx, F.R., Schiller, U. (2006) „An Economic Perspective on Transfer Pricing", *Handbooks of Management Accounting Research*, vol. 2: 673-695

Graci, E. (2014) „Comprehensive Analysis of Transfer Pricing Legislation in Southeastern Europe Countries, available on-line at https://ssrn.com/abstract=2502010 (January 21, 2023)

Hiemann, M. & Reichelstein, S. (2012) „Transfer pricing in multinational corporations: An integrated management and tax perspective, in: Wolfgang Schön, Kai A. Konrad. (2012) "Fundamentals of International Transfer Pricing in Law and Economics", vol. 1: 3-18, Springer Berlin Heidelberg

Holtzman, Y. & Nagel, P. (2014) „An introduction to transfer pricing", *Journal of Management Development*, vol. 33, no. 1: 57-61 https://doi.org/10.1108/JMD-11-2013-0139

Klassen, K.J., Lisowsky, P., & Mescall, D. (2017) „Transfer pricing: Strategies, practices, and tax minimization", *Contemporary Accounting Research*, vol. 34, no.1: 455-493

KPMG. (2022) „Malta introduces formal Transfer Pricing Rules", available on-line at https://kpmg.com/mt/en/home/insights/2022/11/malta-introduces-formal-transfer-pricing-rules.html (February 7, 2023)

Kumar, S., Pandey, N., Lim, M.W., Chatterjee, N.A. & Pandey, N. (2021) „What do we know about transfer pricing? Insights from bibliometric analysis", *Journal of Business Research*, Vol. 134: 275-287, https://doi.org/10.1016/j.jbusres.2021.05.041

Li, J. (2005) „International transfer pricing practices in New Zealand", University of Auckland, *Business Review*, vol. 7, no.1: 59-65

Liu, G., Zhang, J., & Tang, W. (2015) „Strategic transfer pricing in a marketing–operations interface with quality level and advertising dependent goodwill", *Omega*, vol.56: 1-15.

Mashiri, E. (2018) „Regulating Multinational Enterprises (MNEs) transactions to minimise tax avoidance through transfer pricing: Case of Zimbabwe", PhD Thesis. http://hdl.handle.net/10500/25518

Ministry of Finance. (2019) „Regulations on the form and content of the transfer pricing report, the types of methods for determining the transaction price in accordance with the "arm's length" principle and their application", available on-line at http://www.ujp.gov.mk/files/attachment/0000/1155/Plavilnik_za_transferni_ceni_59-2019.pdf (February 3, 2023)

OECD. (2022) „OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations 2022", available on-line at https://www.oecd-ilibrary.org/taxation/oecd-transfer-pricing-guidelines-for-multinational-enterprises-and-tax-administrations-2022_0e655865-en (January 9, 2023)

Perčević, H. (2015) „Uskladjenost regulatornog okvira transfernih cijena u zemljama europske unije”, *Ekonomska Misao i Praksa*, vol. 24, no. 2: 627-650. https://hrcak.srce.hr/149664

PwC. (2013) „International Transfer Pricing 2013/14”, available on-line at: https://www.pwc.com/gx/en/international-transfer-pricing/assets/itp-2013-final.pdf (March 10, 2023)

PwC. (2023) „Moldova - Corporate - Group taxation”, available on-line at: https://taxsummaries.pwc.com/moldova/corporate/group-taxation (February 20, 2023)

Rogers, H. & Oats, L. (2022) „Transfer pricing: changing views in changing times”, *Accounting Forum*, vol. 46, no. 1: 83-107, https://doi.org/10.1080/01559982.2021.1926778

Sari, D., Utama, S., & Rahayu, N. (2020) „Transfer pricing practices and specific anti-avoidance rules in Asian developing countries”, *International Journal of Emerging Markets*, https://doi.org/10.1108/IJOEM-10-2018-0541

UNCTAD. (2023) „Global Trade Update (March 2023)”, available on-line at https://unctad.org/system/files/official-document/ditcinf2023d1_en.pdf (March 25, 2023)

Yao, J. T. (2013) „The arm’s length principle, transfer pricing, and location choices”, *Journal of Economics and Business*, vol. 65: 1-13

The Challenges of Financing Small and Medium Enterprises: Perspectives of Bankers and Business Owners in the UAE

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Abstract: *Small and Medium Enterprises (SMEs) are an important sector for a country like United Arab Emirates (UAE) where they comprise 95% of the registered companies. There are various sources of financing for businesses, however, banks are reluctant to provide loans to SMEs. This paper sought the perceptions of bankers and owners of SMEs about why it was difficult to lend to SMEs or to obtain finance from banks. The paper employs a qualitative approach in the form of semi-structured interviews with eight senior-level bankers and ten SMEs' owners from various industries. The key factors highlighted by bankers that stand in the way of funding SMEs are unreliable audited financial statements and a lack of collateral system, with the most serious being 'skip risk'. The findings also revealed that trade credit from suppliers and factoring are the main sources of finance. There are a few SMEs in the UAE who obtained finance through venture capitalists and private equity funds. Our study suggests allowing expatriates to access funding schemes that are available to locals and developing more Islamic Finance products may alleviate the challenges faced by SMEs. We also hope that the introduction of bankruptcy law at the end of 2016, will mitigate 'skip-risk' as more SME owners become more aware of the provisions of this law.*

Keywords: *Small & Medium Enterprises (SMEs); challenges; financing; UAE economic development.*

1. Introduction

Small and Medium Enterprises (SMEs) play a vital role across the globe by extending significant contribution to nation building (Kongolo, 2010; Saleh and Ndubisi, 2006), they represent about 95% of the total number of companies, 50% of the jobs and 35% of GDP in many emerging markets (Bakhouche *et al.*, 2020). Despite effectively supporting the overall growth of the nations, SMEs encounter serious financial challenges that prevent them from running their businesses smoothly as banks across the globe are reluctant to lend to them (see Saleh and Ndubisi, 2006). The failure to finance SMEs adequately, does not only impact SMEs but also affects the overall growth of any economy (Harrison and Baldock, 2015).

The challenges encountered by both banks and SME owners in the UAE are no exception. There are various thresholds of what constitutes an SME per jurisdiction, however, in the UAE an SME is encompasses micro, small and medium types of businesses with a turnover cap of AED 250m and up to 250 employees depending on

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the sector (Dubai SME). SMEs contribute significantly to UAE's economic growth as they account for 95% of businesses registered in UAE (Baby and Joseph, 2016; Gupta and Mirchandani, 2018; Zarrouk *et al.*, 2020). While 86% of the employment in the private sector is contributed by SMEs, they also account for 60% of the GDP of the country (Baby and Joseph, 2016; Zarrouk *et al.*, 2020). The UAE's strategic location, conducive environment, excellent infrastructure facilities as well as the availability of adequate manpower facilitates in the growth of SMEs which in turn translates to the economic and industrial growth of the country (Kargwell and Inguva, 2012). Although this sector plays a predominant role in every aspect of the nation's immense growth, majority of the SMEs face serious financial challenges to meet their business requirements (Zarrouk *et al.*, 2020). Despite having extreme financial requirements, a meagre 3.85% of the banks' advances are made to the SMEs sector (Baby and Joseph, 2016). Bakhouche *et al.* (2020) found that only less than 25% of SMEs have used bank finance in the UAE. Their study also revealed that 80% of SMEs use personal equity to finance their businesses.

From the perspective of banks in the UAE, they are genuinely facing difficulties and challenges when lending to SMEs based on their unhealthy experience with this segment in the past which has led to the application of stringent policies and norms. Continuous increase in demand for finance by SMEs and constraints from the lending institutions in the supply leave a huge gap in SME's funding requirement. Though the banks would prefer playing proactive roles and considerate approaches towards SMEs, they are still not able to accommodate their requirements due to obvious reasons. According to Baby and Joseph, 2016, the historical losses associated with SMEs by banks in UAE stood at 20% thus making this sector a nightmare for banks. For instance, a group of SMEs investors in 2015 ran away from the country, leaving an outstanding loan amount of AED 5 billion (Kassem, 2017). This phenomenon is often called 'skip risk'. Based on hard lessons learned in the past, banks have adopted an over-cautious approach, that prolongs the approvals and review of renewals (Lynwood Consulting UAE, 2017). The UAE government enacted the Federal Law by Decree No.9 of 2016 on Bankruptcy to mitigate 'skip risk', however, there is very little research on the effects of this law on bank lending to the sector. Another major challenge with SME loan proposals is absence or insufficient hard collaterals to provide security. To resolve this issue significantly, Emirates Development Bank, a government owned financial institution has established a new legal entity called The Emirates Movable Collateral Registry Corporation (EMCRC) to register the movable assets. Based on which, the SMEs can borrow loans from the lending institutions by mortgaging the legally registered assets with EMCRC (Townsend, 2017). However, this facility is available only for UAE nationals and not expatriates.

Based on the discussion above, the researchers sought to understand from both parties, i.e., banks and SME owners why the low percentage of banks' lending to SMEs persists? The literature tends to cover the perceptions of SMEs regarding the low percentage of banks' lending e.g., Khan *et al.* (2021). The contribution of the paper is that it seeks the perceptions of both supply side of funds (banks) and demand side of funds (SMEs).

Hence, the study addresses two questions:

- What are the factors refraining banks from lending to SMEs in the UAE?
- What is the alternative financing for SMEs in the UAE?

2. Literature review

There are various factors constraining the lending institutions from funding the SMEs sector across the globe. The key factors include financial illiteracy, collateral shortage, poor track record, lack of transparency, and unreliable audited statements.

2.1. Lack of financial literacy

Financial illiteracy is an important issue in several countries (Aras, 2017). It broadly underscores the inability to furnish complete business information and credit history by the SMEs to back the loan proposals and it has become a major challenge for the SMEs (see Haroon *et al.*, 2013). In addition, the shortage or absence of required financial information has been the major concern for the lending institutions to consider the SMEs for funding (Zairani and Zaimah, 2013; Ghimire and Abo, 2013). Drexler *et al.* (2014) and Eniola and Entebang (2017) assert that financial illiteracy generally causes the SMEs to make wrong financial decisions at critical times, especially at the time of dealing with the funding institutions. SMEs often fail to present quality information and specific data in the way bankers require to evaluate their credit requests (Aras, 2017). As a result, banks are often reluctant to give loans to SMEs since they fail to meet the long and rigorous lending processes (Haron *et al.*, 2013).

In response to this argument, Haron *et al.* (2013) made some proposals that could improve the services extended by the banks, such as informing SMEs why they are not eligible for finance, and advice about alternative finance schemes, if any, for example government schemes. Banks can also conduct workshops, seminars, and consultancy to educate the SMEs. On the other hand, SMEs should also acknowledge the efforts taken by the banks and coordinate with them and other facilitating agencies to enhance their knowledge on a regular basis (Zairani and Zaimah, 2013). Drexler *et al.* (2014) recommend proper trainings on basic financial principles ranging from consultation programs to comprehensive class training. Such trainings would equip SMEs with financial management skills.

2.2. Absence or shortage of collaterals

Among others, collateral inadequacy has been the major challenge faced by SMEs in securing lending from the banking institutions across the globe (Steijvers, 2009; Fatoki and Smit (2011). Moreso, in the past when it was not easy for foreigners to own properties in the UAE, most SMEs were unable to provide collateral securities, an aspect that is likely to improve due to changes to ownership laws. By taking mortgage or pledge on the assets, the banks extend credit facilities and in case of any default by the borrowers, the banks can legally sell the mortgaged properties and recover their dues. Since SMEs lending is considered risky, the financial institutions were adamant on securing the collaterals before the approval of credit facilities (Loumioti, 2011). The foremost reason why collateral is often required by the bank is to mitigate exposure risk in case of default (Blazy and Weill, 2013). At the same time, SMEs face serious problems to access finance when they are in dire need, particularly, the service sectors which do not own tangible collaterals to offer (Haron *et al.*, 2013). The same problem persists in other countries e.g., Philippines, South Africa, Romania, China and in MENA region (Aldaba, 2011; Fatoki and Smit, 2011; Bădulescu, 2010; Hong and

Zhou, 2013; Saleem, 2013). Additionally, the SMEs face credit rationing by the lending institutions whereby not getting the requested credit limits due to information asymmetry even if the SMEs are prepared to pay higher finance costs than the market rates (Domeher *et al.*, 2016). Rationing can be avoided when SMEs have sufficient collaterals to offer to the lending institutions (Steijvers, 2009).

The fear of default increases with the weak institutional environment with less protection for creditors. When the legal process remains ambiguous and dragging with weak creditor rights, the lending institutions get into major troubles when dealing with default cases. This causes great concern to the bankers in SME lending. It is essential that the lending institutions rights are protected when default takes place, and the laws and procedures should be enforceable in places where the institutions operate (Mol-Gomez-Vazquez *et al.*, 2018). The SMEs in the MENA region were not adequately supported by conducive institutional environment with weak legal structures and judicial inefficiency (Saleem, 2013) until recently.

Since deficiency or absence of collaterals seems to be the most critical and common problem, amongst SMEs, there is a need for institutions to become more flexible, provided there are guarantees from the government Central Bank like in other countries. Instead, the banks must develop new ways of assisting SMEs who require finance. Here there is an opportunity for Islamic Banks to intervene. Aldaba (2011) suggests that banks could consider other business parameters such as acceptable sales level, profit level, liquidity level, business potential, growth plan to justify availing the finance.

2.3. Poor performance and unimpressive track record

The lending institutions face stiff challenges in processing the credit proposals from SMEs with poor track record, low operational and financial performances, and inferior management team. According to Aldaba (2011), lending institutions in Philippines decline SMEs' requests due to their uninspiring track record, low revenue and profit and risky business model. FinMark Trust in South Africa makes a shocking revelation about the bank loans, which are obtained by just 2% of the new SMEs in the country (Fatoki and Odeyemi, 2010). Their study revealed that funds allocated by banks were not fully utilized as SMEs failed to meet the lending criteria.

Aldaba (2011) and Eniola and Entebang (2017) suggest that SMEs should be professionally equipped and enlightened on every aspect of their business operation and financial administration. SMEs need to streamline their operations, ensure good governance, consistent growth and strive to achieve their targets which can give the confidence and comfort level to the lending institutions. Hudson *et al.* (2001) recommend that performance measurement (PM) can be used by the banks to evaluate enterprises that are struggling with low performances as this could be beneficiary in the long term. Although PM has gained acceptance extensively among the qualified managers attached with SMEs, there were no serious efforts to implement and upgrade SMEs due to lack of financial resources and absence of strategic planning. However, Garengo *et al.* (2005) reveal that though they realize the significance of applying PM in SMEs, only few enterprises have implemented performance measurement. They strongly recommend that lending institutions soften their rigid approaches and extend broader outlook by enlightening the SMEs to ensure their financial literacy, efficient management, timely presentation of quality reports and good standing in the market. It would appear that, the issues mentioned above need to be tackled with utmost care with a view to arriving at permanent solutions.

2.4. Lack of transparency

Eferakya (2014) strongly advocates for absolute transparency in maintaining accounting records which results in much-required confidence to the lending institutions to evaluate the SMEs financing proposal favorably even by relaxing some of their stringent terms and conditions. The SMEs that have good credit rating and transparent business operations normally qualify for credit lending without any difficulties (Berger and Udell, 2002). The best possible way of achieving SMEs access to bank finance is through resolving the flaws and revamping the entire financial systems (Beck *et al.*, 2008). Kwaning *et al.* (2015) in Ghana urge SMEs to be honesty in their dealings and commitments to gain confidence from the lending institutions. Some SMEs' owners remain manipulative and not transparent; give fabricated information to the lending institutions while attempting to borrow. By adopting unfair means, financial maneuvering and manipulative approaches, the wrong doers cause irreparable damages to themselves and to other genuine fund seekers (Kwaning *et al.*, 2015).

Lending institutions often charge heavy interest or limit their credit exposure for their SMEs' customers when they lack transparency in their operations (Vandenberg *et al.*, 2016). In addition, the lending institutions are also blamed for undertaking borrower's creditworthiness in an unprofessional manner based on the study in Ivory-Coast (Ghimire and Abo, 2013). Also, the bankers need to be equipped with adequate resources, time and knowledge to handle the funding applications from SMEs with more enthusiasm (Ghimire and Abo, 2013). At the same time, SMEs are advised to join hands for common benefits so that they can extend covenants and guarantees collectively to avail larger financial benefits (Kwaning *et al.*, 2015).

2.5. Unreliable audited financial statements

Audited financials reflect the operational results and true and fair view of the financial position of an entity (Best *et al.*, 2001; Sacerdoti, 2005). The audited statements play an important role for the bankers to carry out the credit appraisal work and assess the credit worthiness of a customer (Zairani and Zaimah, 2013; Berger and Udell, 2002). The decision to lend to SMEs and the terms and conditions of the loan agreement are mainly based on the quality and strength of the audited financial statements (Berger and Udell, 2002). In many parts of the developing countries, SMEs are not able to submit financial information authenticated by auditors (Ghimire and Abo, 2013). According to Kwaning *et al.* (2015), many SMEs in developed and developing nations do not prepare authentic audited financial statements which can be relied upon by the suppliers of funds. As a result, bankers express their discomfort on the quality of audit and decline the credit proposals (Ghimire and Abo, 2013).

2.6. Disinterest by foreign banks

Foreign banks in most of the countries play passive role and show no interest in extending financial assistance to SMEs due to extensive corruption prevailing in some countries and inadequate protection cover against properties being kept as collaterals and unfavorable regulatory mechanisms (Ghimire and Abo, 2013). Rocha *et al.* (2011) strongly advocate for more foreign banks in the region to work alongside regional banks and provide significant contribution to the SME segments towards their growth.

2.7. Fragile lenders' rights and weak legal structure

The MENA survey conducted by the World Bank and Union of Arab banks in the study of Rocha *et al.* (2011) reveals that lending to the SME segments reflect only 8% on the total lending and out of which 2% only is channeled through the GCC countries. The survey reveals that banks in the region express their apprehensions about SME lending because of the weak financial structures and systems the SMEs are associated with and fragile lenders rights. Furthermore, Sacerdoti (2005) claims that weak legal systems result in banks assuming high lending-risk and thereby restrict lending.

2.8. Political risk

In some countries, the local political parties influence the banks to lend SMEs which usually results in bad debts for lending institutions (Bădulescu, 2010). Also, due to political interests shown by the government, sometimes mediocre and non-viable projects do get funding from the institutions which would have been easily deployed in performing industries (Choe, 2007).

2.9. Need for Government support

Wang and Yang (2014) state that government policies also play major role on Banks' lending towards SMEs. It is paramount for the governments to come out with supportive policies in providing financial packages for the development of SMEs. Bankers are looking at multiple qualitative factors with SMEs prior to opening the funding channel, however, SMEs always struggle to fulfill the criteria. There is ample evidence of government intervention to assist the lending institutions through financial incentives, grants, subsidies, special loans, and tax exemptions (Fatoki and Odeyemi, 2010).

Bădulescu (2010) in reference to Romania, recommended government backed institutions to work with banks by providing subsidies and grants to enable them to extend additional credits to SMEs. Similarly, Wang and Yang (2014) echo the importance of government support in order to unleash the potential of the SME sector. Governments can offer tax benefits to the lending institutions extending credits to SMEs and also create institutional frameworks that ensure the recovery of the loans (Kwaning *et al.*, 2015). Additionally, governments can provide training facilities to upgrade the standards of management personnel representing the SMEs (Wang and Yang, 2014).

Although governmental organizations extend moderate support to SMEs, they are still considered to be inadequate and not promising to revive the sector. It suggests the need to have unified efforts by the government and institutions to remove the obstacles and establish way-forward in meeting SMEs grave financial needs (Emine, 2012).

2.10. Alternative funding for SMEs

Given that accessing bank finance becomes increasingly difficult, SMEs are forced to explore alternative financing options to meet their dire business requirements. The commonly available options are private equity, venture capital, supplier credit, factoring and governments backed institutional arrangements and schemes.

Private equity capital. The most effective alternative form of financing has been private equity capital where high net worth individuals based in the region, foreign investors, Private Equity firms (PE) show active interest in financing SMEs (Maierbrugger, 2013). However, financing through private equity channel is common in the US and several European countries.

Venture capital. Another alternative source of financing arrangement is venture capital. This financing model works entirely based on the risk and expected return on a business venture (Inegbenebor, 2006). Venture capitalists generally prefer lucrative business proposals backed by innovative technology which can ensure excellent rates of return to them and avoid taking start-up companies. Interestingly, the investors do not get involved in day-to-day operations and assign the entire responsibilities to the SME owners. Japanese and UK venture funds are available only for later stage investors as mentioned by Mayer *et al.* (2004). Managed by top notch professionals, venture capitalists choose to invest in fast growing innovative firms with excellent growth potential. Due to the nature of the venture, the borrower could be relieved of interest until the product becomes a success. On the negative side, venture capital is perceived to be expensive considering the capital and monitoring cost as well as a long processing time involved (Winton and Yerramilli, 2008). Sometimes, the venture capitalists can be aggressive to achieve the targeted result (Inegbenebor, 2006).

Supplier credit. The most popular source of external finance after bank funding is considered to be supplier credit (Beck *et al.*, 2008). When a firm procures materials or avails services for which the payment is delayed, supplier credit arises. Here, the supplier or service provider extends normal credit period, say 30 to 60 days, and if the payment is not done on the due date, finance charges are applied for the additional period (Fatoki and Odeyemi, 2010). It is a natural source of financing as it generates from normal business transactions. Credit from suppliers is considered to be a cheaper and reliable form of financing, since it involves no major efforts by the borrower and is based on a simple mechanism. At the same time, supplier credit could be an expensive option as well if payments are not done within the agreed time frame. The credit limit, credit period and interest costs are determined based on the credit worthiness of the buyer (Fatoki and Odeyemi, 2010).

Factoring. Factoring is another financing method effectively in force in many developed countries. Here the firms sell their quality receivables to specialized institutions at a discounted rate and ensure realization of cash immediately (Mol-Gomez-Vazquez *et al.*, 2018; Klapper, 2006). Factoring facilitates the SMEs to maintain healthy and uninterrupted cash-flows with reduced risk and also helps the promoters to focus their attention entirely on developing their business (Vaddepalli, 2014), thereby assisting with the management of working capital. More importantly, the factoring institutions mostly assume total responsibility and risk attached with the receivables besides taking care of its protection and collection. No collaterals are required by the institutions which is a major relief to the SMEs. More importantly, quality of the receivables and satisfactory credit information about the customers play paramount role to make this financing option successful (Klapper, 2006).

Crowdfunding. A new financing source in crowdfunding is available for entities. As the name suggests, crowdfunding signifies contribution from common people towards viable projects (Stemler, 2013). New entrepreneurs with creative and unorthodox ideas take benefit out of this specialized funding (Stemler, 2013). Highly innovative projects yielding decent returns get attention from the vast investor community across the globe (Lehner *et al.*, 2015). Crowdfunding can be raised in the form of debt or equity by using the internet and media platforms (Lehner *et al.,* 2015). The financing amount can be smaller or even substantial depending upon the needs of the business (Stemler, 2013). Recently, a number of scholars in the Gulf Cooperation Council (GCC) and other Muslim countries, have been debating the potential of crowdfunding under Islamic Finance. Saiti *et al.* (2018) argue that crowdfunding is not Shariah compliant, if it charges interest, while other scholars, (see Rabbani *et al.*,2020) suggest that legal acceptance of crowd funding may reduce transaction costs. On the other hand, Jaziri and Alanazi, 2020) indicate that some GCC countries have no formal law or guidance on crowdfunding. Contrary, to Saiti *et al.* (2018), Petruzzelli *et al*., 2019; Hendratmi *et al.*, 2020 and Thottoli (2022) suggest that crowd funding that supports halal initiatives and products is Shariah compliant. The Islamic economy is tapping into all these new models of financing, for example, Ishak and Rahman (2021) investigate the application of 'mudharabah') as a financial instrument that can be accessed through crowdfunding.

Specialized banks and Government schemes aiding SMEs. To assist the sinking SME sectors, Nigerian Central Bank introduced an effective financial scheme, SMIES, whereby banks allocate 10% of their pre-tax profit towards genuine business proposals falling under SME sector (Inegbenebor, 2006). Similarly, in Philippines, the Central Bank provides credit guarantees to the banks supporting SMEs, thereby encouraging the banks to support SMEs better (Vandenberg *et al.*, 2016). Patterns may vary but the bottom line with most of the Asian countries is that there is active government support for SMEs through the Central Banks and Public Sector banks.

Cooperative banks. These banks serve SMEs rather than large size financial institutions (Hasan *et al.*, 2017). Considering smaller structure and simple hierarchy, SMEs are able to maintain excellent relationship with such banks and get comprehensive financial packages on decent terms and consequently yield good performances. Easy access, simple procedures, direct relationship with the institutions are some of the positive factors these banking structures are associated with. However, inadequate financial resources may constrain the cooperative banks from accommodating new SMEs. Additionally, the lending costs are high in small cooperative banks than large banks (Hasan *et al.*, 2017).

According to Rocha *et al.*, (2011) a few countries in the MENA region also launched special credit incentive programs in the form of subsidies and guarantees to aid the weak SMEs, albeit there is still a need to design a well-structured and low-cost guarantee model to support the SME segments.

To overcome difficulties faced by SMEs many of the Asian countries have taken a pro-active step of establishing a dedicated bank to serve the sector. For example, Thailand established *SME Development Bank of Thailand* and India created *Small Industries Development Bank of India.* This kind of focus can help the SMEs to overcome difficulties. Many of the countries have several public sector financial institutions who have dedicated SME divisions catering to their needs. As the public sector enterprises do not seek to concentrate on profits as much as private banks do, their ability to support SMEs would be much better (Vandenberg *et al*., 2016).

2.11. Other sources of funding for SMEs in UAE

The Central bank in UAE openly invites private equity investors to come forward and invest into large SME segments to fill the funding gap and work towards mutual benefits (Kassem, 2017). However, studies undertaken by academic scholars in UAE claim that equity financing is not effectively prevalent in the market and the SME owners are finding it difficult to raise equity funding (Kargwell and Inguva, 2012; Schiliro, 2015). With trading activities playing dominant role in UAE, suppliers' credit would naturally tend to be the foremost source of finance. However, the study conducted in UAE by Yaseen (2014) claims that obtaining suppliers credit is a difficult task and the suppliers are hesitant to provide adequate credit to the entities. In addition, banks in the UAE provide factoring services to their SME customers through specially designated departments (Mashreq Bank, UAE). In addition, there are specialized institutions in UAE which provide factoring facilities, though less popular than banks. There is another non-profit organization, Dubai SME, which provides continuous support and guidance to the SME entrepreneurs in every phase of their growth. It extends superior professional guidance in every aspect of business to UAE citizens, owning 100% stake in business in Dubai. Also, SMEs can avail moderate financial assistance in the form of startup loans and guarantees from specially designed government-aided funds at nominal rate of interest and long tenure. In addition, SMEs get 5% allocation in their favor on all the purchases being made by Dubai Government under the Government Procurement Program. However, the entire advisory services relating to financial, commercial, operational, business strategies and funding assistance accessible to UAE Nationals only and not for expatriates doing business which are large in number (Dubai SME). Similarly, Khalifa Fund, a non-profit government agency based in Abu Dhabi extends comprehensive services to SMEs that are locally owned in the areas of management, strategic planning, finance, operations and other quality measures.

3. Research methodology

Our research is exploratory in nature as it teases out the challenges faced by the lending institutions (supply side of funds) and owners of SMEs in the UAE. Due to exploratory and limited study in the area in the context of UAE, we opt for the grounded theory with the expectations to develop new theories from the analysis. We held extensive semi-structured interviews with the bankers and SMEs' owners as they allow scope for modifications and alterations as and when required as opposed to the rigid structured interviews (Saunders *et al.*, 2016).

Our sample consists of banks that lend the most to SMEs and diverse SME owners. We employed the purposive sampling technique to identify bankers SME owners. Where possible we relied on snowballing to get referrals. The research targeted 18 SMEs and 8 bankers from 6 banks. However, only 10 SME owners out of the sample size of 18 SMEs agreed to be interviewed. Face-to-face interviews were conducted with the bankers on their bank premises. When it came to SME owners, most were interviewed through the telephonic mode and the rest, personally. The interviews lasted for about 35-45 minutes with each interviewee.

Table 1 shows the background detail of bankers and SMEs' owners. Table 1 below shows that bankers possess the right blend of knowledge, experience and expertise in the field of SMEs banking within the boundaries of UAE. They occupy prominent positions in their respective banks hence providing validity to this research. To get in-depth and diverse views, senior bank managers representing both credit and business were approached. Similarly, Table 2 shows the profile of owners of SMEs in diverse industries of UAE.

Table 1. **Bankers' profile**

Interviewee	Designation	Experience (years)	Qualification
B1	Senior Vice President and Head of Commercial Credit	28	MBA Finance
B2	Senior Vice President and Head of Trade and Working Capital	20	Master in Finance
B3	Senior Manager - SME	11	MBA Finance
B4	SME Unit Head	15	MBA
B5	SME Credit Head	15	C. A, C. S
B6	(undisclosed)	28	MS
B7	Vice President – Unit Head	32	MBA
B8	Vice President - Unit Head	20	MBA Finance

Table 2. **SMEs' Owners profile**

Interviewee	Core business activity	Business age
S1	Aluminum and glass LLC	5+
S2	Financial and management consulting	15+
S3	Fiberglass and light weight concrete products	25
S4	Management advisory	5+
S5	Printing - offset/digital	15
S6	Ship management and ship rental (chartering)	13
S7	Printing	32
S8	Maritime agency	40
S9	Offshore shipping services	20
S10	Trading and distribution	25

The names of the banks and SMEs are not mentioned due to confidentiality.

4. Findings and data analysis

This section reports the findings of interviews with eight bankers and ten SMEs' owners. The analysis of the interviews leads us to develop different themes.

4.1. Importance of SMEs

The bankers were asked to highlight the importance, role, and structure of SMEs. The bankers highlight that SMEs play a significant role in shaping the fortune of the nation since they are large in numbers and actively engaged in various business activities extending significant contributions through various disciplines. All the bankers endorse the same views and emphasize the importance of SMEs towards the growth of the nation. Interviewee B2, for example, states:

''SMEs are always considered to be the key drivers for the economic growth, if the banks do not support the SMEs, it will negatively impact the economy. So, all the banks keep targets to boost the lending to the SMEs because they are the backbone of every economy''

SME is more an entrepreneur driven business rather than a structured organization where management is separated from ownership. SME definition also varies from bank to bank primarily based on the turnover. For example, the banker B5 considers SMEs with a turnover of minimum AED 5m–10m whereas the banker B1 defines SME as having maximum turnover of AED 250m. When it comes to the age of SMEs and funding, banks in general lend to those who have been in business for at least 3 years. Despite contributing significantly to the economy, the percentage of the total loan of the bank to the SME segment is very low. For some banks, it is as low as 1%, with the average being about 5%, although one leading bank (B6) in the region claims their lending to SMEs is about 25-30% which is significant.

When the researchers asked about the increase in SMEs' lending in the near future, most of the banks responded positively. We conducted our interviews before Expo 2020 when there was a lot of optimism in the country, and the banks in the UAE focused on SMEs as claimed by B7. Also, the bankers indicated that SMEs give the banks higher returns, compared to corporate lending so banks are generally keen to grow the lending to SMEs. As indicated by B8, most of the international banks moved out of the SMEs market in UAE as they only focused on institutional and corporate banking. Hence, there exists a vacuum when it comes to lending to SMEs, the local banks have really pitched in to at fill that vacuum. To support this claim, B1 maintains:

''We are keenly targeting to increase the loan size to SMEs to at-least AED 2.5 billion from the current lending of AED 1 billion.''

4.2. Bases of SME lending

The bankers were asked to comment on the main bases of SME lending for which they responded that there are two broad classifications under which banks extend lending i.e., parameterized and judgmental. The former is based on bank statements whereas the latter is based on audited financial statements. Between 60%- 70% of the bankers, we interviewed used parametrized lending while the remainder used their judgment based on the quality of audited financial statements. For a smaller risk, these banks go for parameterized lending and for higher risk, they go for judgmental approach. In this regard, Interviewee B6 claims:

"If I look at my lending to the SMEs, probably 60% will be parameterized and 40% on judgmental based on financial statements…our assessment of limits for majority of the clients will be based on bank statements only."

When asked about segment-customer cap (limit) and the preferred and restricted industries, most of the bankers are reluctant to divulge information on the internal segment cap. However, two of them gave an indication as AED 50m being the customer cap, AED 30m towards general limit and AED 50m for contracting and real estate because they offer collateral. For example, the respondent B6 states:

"We have per limit cap per customer, but we don't have a cap for the segment, we have an internal trigger which we follow, and our policies clearly specifies how much we can give secured and unsecured to a customer in the SME sector."

Regarding the preferred and restricted industries, banks generally prefer manufacturing, construction, real estate industries and businesses owned by UAE nationals. Secondly, the banks prefer trading companies that have reliable loan repayment history. Restricted industries include foodstuff, computers, and textile trading among others. In this regard, interviewee B1 explains a possible reason:

> *"There is significant two-way trade, people buy and sell to each other, thereby just inflating the turnover and number of transactions".*

However, interviewee B6 held a different view about preferential segments, as his bank did not use their criteria. Every month, his bank undertakes a thorough evaluation on the customer's portfolios in terms of industry, size, and type and the bank tightens the rules wherever the risk is higher or visible.

4.3. Factors that inhibit banks in UAE from lending

The bankers highlighted the challenges the banks face when lending to the SMEs. The bankers mentioned the following main hurdles in the way of funding to SMEs.

4.3.1. Submitting financial information

Submitting proper financial information is imperative for any organization seeking a loan. In this regard, there are different opinions from the bankers, while some stated that most SMEs do not prepare proper financials, yet others claimed that their clients have accounting records. The interviewee B6 holds that customers do submit information but at a very basic level without much clarity about the business model. He states that:

> *"Many times, we find that information received is very basic and not giving detail about the customers [SMEs]. Even when you raise queries, the customers' answers will be generally vague and there is no focus. Then you decide whether you want to give limits or not and what kind of limits you want to give."*

In contrast B6, B3 and B5 feel that customers are well-versed with the bank requirements and provide proper information. B2 and B3 confirmed that over 70% of their customers comply with the requirements. B5 confirmed to have a special program wherein they do the evaluation using specially techniques without audited financials and extracts the required information from the SMEs to complete the evaluation. According to B8 and B4, SMEs which have taken borrowings in the past provide the required information to the banks. The respondent B8 further claims that:

> *"When SMEs are in their initial stage, especially in the first 3 years, they do not really provide us what we are looking but after borrowing from us for a while, they comply to our requirements."*

It is evident that customers do furnish some basic information but certainly not adequate for the bankers to perform the required credit appraisal based on the information received. Therefore, it becomes essential on the part of customers to provide further clarity on the lending proposals and continue resolving ongoing queries from the bankers satisfactorily.

4.3.2. Performance track record

An impressive performance track record generally gives confidence to the bankers to consider the credit request favorably. Majority of the bankers are of the opinion that SMEs are not consistently performing well in terms of profitability, liquidity and leverage. B1 expressed his concern on the performance track record and its authenticity:

> *"Their [SMEs] performance happens to be neither impressive nor consistent concerning the profitability and leverage which is one of our major concerns. Also, I fear that their financial statements may not reflect the reality and need to be re-validated by the bank through detailed analysis."*

The respondent B8 claimed that SMEs' owners assume the entire financial operations of running the enterprises by themselves without delegating to those who have expertise resulting in financial mismanagement. Furthermore, B8 affirms that the track record is unimpressive and highlights the liquidity issues to be the major challenge and grey area for this sector. He indicates:

> *"Dubai is a credit-driven market, where 70% are trading businesses deal with credit. The company will have a decent profitability but there is a real challenge in the liquidity. Because until and unless you do not recover your receivables, you will not realize your profitability."*

Contrary to B1 and B8, B3 opines that when SMEs are able to obtain financing, it means that their financial capability is generally healthy, otherwise they will not be able to get the financing.

In general, bankers are not convinced with the track record and credentials of the customers, which are paramount for the bankers to back customers' credit requests. The respondents emphasize that the customers need to improve their credit rating by maintaining quality performances.

4.3.3. Security coverage (collateral)

Banks expect the customers to provide adequate collateral to cover their lending risk. All the bankers uniformly confirm that lack of collaterals has been the most challenging hurdle to process the loans. On the security coverage, most SMEs do not provide any kind of security. The interviewee B1 says that our bank does not lend without collateral due to financial situations in the recent past. Since the SME sector is considered riskier than other segments, the banks are committed in getting the collateral arrangements to cover their lending risk. The interviewee B2 adds that the UAE has a smaller number of manufacturing entities and more of trading and service industries, so they can only offer stocks and receivables as collateral as they do not have any significant tangible assets.

To resolve the security coverage issue, the bank of interviewee B6 came out with a completely unsecured product to lend customers without securities, but at the high interest rate. However, when the customer adds some sorts of securities, the interest rate comes down. The interviewee B6 further illustrates this with an example:

> *"If a guy works in this country, after six months if he becomes able have a running business, we lend money to him without any security. Naturally, since the loan is unsecured, it is highly priced. As and when he adds few securities, the pricing comes down."*

The researchers also got clarification about the Loan to Value (LTV) concept that is applied by the banks when offering secured lending and how banks deal with non-registerable assets owned by the SMEs. All, the bankers we interviewed held the same view that the LTV for property is 70% maximum and against cash and Stand-By Letter of Credits (SBLCs), 95-100% (Interviewees B4, B2, B8 and B7). The respondent B8 claimed that no legal authority existed earlier to register the assets in UAE which was very challenging in the past. Interviewee B4 stated that his bank did not fund SMEs whose assets are non-registerable. The respondents B1, B7 and B8 state that 90% of the assets in UAE are non-registerable and as per recent regulations movable assets can be registered with Emirates Movable Collateral Registry Corporation, a subsidiary of Emirates Development Bank (EDB). Thereby, the banks would be in a position to create registerable charge on movable assets. However, they were unaware of the procedure involving enforceability. B8 adds:

> *"But recently, the EDB has come up with programs where an SME owner can register their movable assets so the banks can have a first or secondary charge on assets. They have started this for companies with less than 150 million in turnover. Once it is registered, the SMEs can give this as a collateral to particular banks and get financing...I think that this is a good initiative."*

4.3.4. The audited reports of SMEs

Audited financials are imperative to assess the performance of any enterprise and derive meaningful conclusion on various aspects. It is of utmost importance that the facts and figures reflected in the report are expected to reveal the true state of affairs of the entity. Interviewee B6 stated that:

> *"Since there is no auditing body here and the auditors available in this market are from various countries, their understanding and application of accounting practices vary."*

Respondent B2 echoed a similar view and added that there are no government regulations for the auditors and thereby the reliance on the audited financial statements by the bankers is very low. He further explained that some auditors prepare the financial statements to suit the clients' requirements. Therefore, most of the bankers do not rely on the financial statements since they are not properly audited and do not reflect the true and fair picture of the business entity. To explain this, interviewee B6 illustrates with another example:

> *''If you are an X nationality guy, you go to an X nationality auditor from your own country. The auditor gives a report which is not very good, not properly analyzed and the information is very sketchy, which makes it difficult to rely on that."*

Hence, the banks' reliance and the confidence level on the audited financial statements is very low. Most of the banks have an approved list of auditors classifying them into categories A-E. The SMEs generally work with category 'C' or 'D' auditors. Interviewee B1 endorsed this fact that the majority of SMEs do not employ auditors of good quality because they are expensive. Respondents B4 and B8 state that their clients normally do not have the banks' approved auditors in the first year but upon getting the credit facilities, the clients (SMEs) upgrade the auditors as per banks' approved list.

When the bankers are asked about the required steps taken to safeguard against the potential misrepresentation of audited financials, some of them candidly shared their views. For example, interviewee B4 stated that they conduct a proper site inspection by visiting SMEs location, factory, office and other facilities as they do not believe in their balance sheet. The purpose is to determine the true value of the SMEs to justify the sanction of requested amount. Some bankers normally consider bank statements of SMEs as their base and carry out all their comparative evaluation and assess realistic turnover, cost of goods sold, administrative expenses and profit. Also, the banks nominate independent professionals on their behalf to verify specific areas of clients' business. The interviewee B1 confirms:

> *"To safeguard against potential misrepresentation of financial information, we get into the bank statement of SMEs and try and estimate the credit turnover, cost of goods sold of the company and compare it with the financial statements. Also, some banks have started employing 3rd parties to corroborate the bank statements."*

4.3.5 Skip-risk leaving the UAE

Prior to December, 2016 there was no bankruptcy law in the UAE which is one of the most important factors for banks to avoid lending to SMEs. Without the law in place the risk of 'skipping' was high as people tended to flee out of the country when they are in extreme financial trouble. All the bankers stressed upon this critical issue causing great concern to them. It is not yet clear what the impact of the new bankruptcy law has been on skip risk. However, the government moved in to plug the gap and stabilize the markets, and this law, it will substantially improve the confidence level of the bankers. The bank will gain confidence that the owners will not exit the country when they are in trouble, instead they will stay in the country, run the business, and work out solutions legally and come out of financial distress. In this regard, interviewee B2 claims:

> *"Absence of proper bankruptcy law was one of the main reasons why bankers say no to SMEs. When there is bankruptcy law, the owners of SME will be afraid of the legal action the banks might take against them, so they will simply pack their bags to leave this country."*

We argue that the effect of any new regulation takes time to filter through to all affected parties, as the interpretation of such law may time to be certain and create case law. So far, this is still an under-researched area. One, cannot gauge the level of awareness amongst SMEs, and besides restructuring takes place between the debtor and creditor, and not privy to the public.

The SME market in this country is driven by expatriate community whose legal stay in this country requires periodic visa renewal which causes uncertainty about their long-term plans to remain in this country. Respondent B2 further adds:

> *"Over 90% of the SMEs business is managed by expatriate community. They don't have a long-term sustainability plan since they do not get permanent residency, passport etc. As long as their business is doing well, they will stay in this country, and they leave the country the moment there will be a setback on the business."*

Interviewee B6 states that in the past when the SMEs defaulted, the owner would be put behind the bars. However, after few years of sentence, they would come out and claim to be insolvent. For this reason, the bank tried to sort out a strategy to settle their dues rather than putting them in prison. Most bankers feel that when the customers get bankruptcy protection, they should not abscond from the country. Respondent B5 stated that there were some customers in default because of the current deteriorating market situation. Bankruptcy law will certainly help those customers to stay back, negotiate with banks and try to do the business again and repay the loans. The bankruptcy law came into effect in January, 2017, before its impact could be discerned the Covid-19 pandemic struck again rendering many SME businesses unprofitable. Implementing this law will bring a great deal of relief to the banks across the nation. Interviewee B5 confirmed that:

> *"There were a lot of discussions which have taken place, the drafts also being shared, so by the end of 2018, it should be implemented."*

From the above answer there is evidence of a lack of awareness about this law, yet the local newspapers have been awash with the news, however, some of it is published in Arabic, a language that a few expatriates understand.

4.3.6 Fear of default

Default has caused concern specially when the bank extends unsecured lending. Again, many bankers were hesitant to disclose any information on the percentage of defaults within the banks due to their internal policies. Only two bankers indicated that it is less than 1% and about 5% in their banks respectively. One of the bankers quotes:

> *"SMEs in comparison to the rest of the clients have a very high rate of default. At one point in time in 2014, 2015, almost 20% of the entire amount of SME lending was in default and the non-performing loan ratio of SME lending was as high as 12-13% which has now fallen to about 4% to 5%."*

In a healthy situation, the delinquency ratio for SMEs is about 3% according to interviewee B2. There are several reasons why SMEs default. Respondent B7 cites that the most common reasons include non-payment by the SMEs customers in time and delayed payment by their customers. When the SMEs fail to recover the collections in time, they fail to fulfill their financial commitment to various stakeholders the banks. The adverse market condition amplifies such failures to pay the loan. Interviewee B7 further stated that fraud and intentional default sometimes take place. As indicated by some bankers, high interest rate would also lead to default. SME market in UAE is highly competitive and the traders maintain thin margin for their continuance, paying high interest to the banks is likely to reduce their profits and put severe stress on them resulting in default. Interviewee B1confirmed:

> *"High interest rates do contribute to a very high rate of default for the simple reason that if businesses are reliant more on bank credit, high interest rates hurt them."*

On the contrary, interviewee B2 justified charging higher interest rates. He argued:

> *"SMEs have high risk, when the banks take high risk, you need to charge higher interest rate to cover your default and maintain your net equalization rate."*

B6 also expressed identical views that charging higher interest rates is justified and stated that

> *"For a customer less than a year old, even if I charge him 20%, he will come because he wants a foot in the door. He feels, even If I charge 20%, he can make 3- 4% more. Just because of interest rate nobody has gone bad."*

Despite facing defaults against unsecured lending, the banks have not totally abandoned lending to SMEs. Respondent B4 maintained that although policies have become more stringent, the bank continues to lend. Interviewee B6 reaffirmed that his bank was fully committed to serve this segment as before but with a cautious approach and intense monitoring. He affirms:

> *''We never stopped lending and continue to lend to SMEs. Only thing, the goal post has changed, when you find stress in a sector you normally tend to be a bit more careful and put additional conditions and collateral requirements''*

4.3.7 Government support

Recently, the Government has established schemes, such as Dubai SME and Khalifa Fund, to facilitate the SMEs. These financing schemes are accessible to the UAE nationals only. The all-inclusive schemes to help the expatriate businesses are still under discussion and may take time to implement, resultantly, the challenges continue for the banks. Nevertheless, to give absolute comfort and confidence to the bankers in this volatile market, the government has recently established a credit bureau, Etihad Credit Bureau (ECB), which provides complete credit history about the borrowers to the bank. All the bankers have stated that the bureau has indeed facilitated them. The bankers had a challenging time to obtain updated credit profile of an SME prior to establishing the Bureau. Interviewee B1 claimed:

> *"The recently launched ECB has been very useful for banks and has improved our confidence in SMEs. It reports on all individuals across the UAE and maintains their borrowing data. Credit bureau provides a proper score based on which lending is done."*

Interviewee B3 states that this credit bureau gives information even for small credit exposure. It helps both the banks and the SMEs. The more information the banks can get about an SME, the more they are comfortable in lending. He concludes by stating:

> *'...so the good SMEs benefit from it and the bad SMEs suffer from it."*

Respondent B8 claims that the ECB provides most sensitive information at micro-level. Banks can see whether the customers are involved in multi-banking exposure, any default in the past, past track records and a credit score based on that.

Another major accomplishment by the government is the provision of credit insurance scheme. Interviewee B6 confirms that the government has launched a credit insurance scheme for the large section of SMEs. He further added that a fully owned government bank is empowered to give insurance coverage up to 90-100% of the loan amount. This is primarily applicable to UAE nationals only. Interviewee B3 also second the opinion of respondent B6 that the government has implemented number of welfare measures aimed at SMEs like reduced margin for labor guarantees, efficient free-zones and other smart services.

4.4. Alternative financing for SMEs

The section reports the views of both the owners of SMEs and the bankers about the alternative sources of financing for SMEs in the UAE. Due to several factors that hinder SMEs from obtaining bank finance as discussed earlier, they require more viable finance options to meet their requirements. The generally perception among owners of SMEs across various industries is that banks are not accommodative and flexible in understanding the limitations of credit requests. Before asking the SMEs' owners about the various alternative sources, they were asked to share their experiences with the banks which prompted them to look for other financing options.

Interviewee S4 stated that during his earlier application for a business loan, the bank was inconsiderate due to increased risk factors in SMEs. Respondent S6 felt that banks are conservative, not accommodative and prefer dealing in secured lending rather than lending based on balance sheet. Interviewee S8 too reacted sharply, stating that banks do not understand limitations of SME business while narrating:

> "*Banks do not understand our plight and paint all companies with one brush."*

Yet, other owners like S1 and S3 felt that banks were indeed flexible and considerate with their companies when they submit all the required documents and remained bank's customer for at least a year. When the applicant has an acceptable track record and credit history of the companies, the bank is more likely to lend to them. In this connection, Interviewee S3 stated:

> *"Provided if the requirements are presented methodically, banks are able to assist us better."*

Added to this, lending interest rates also play a crucial part in SMEs and causes major discomfort while seeking financing. Almost all the SMEs' owners mentioned that the rates are unfair and untenable considering the tight market situation and with the meagre profits being generated; the exorbitant pricing charged by the bank wipes out the profits. For example, Interviewee S7 claimed that:

> *"Rates of interest are substantially high which makes it difficult to accept working capital loan offered.*"

Interviewee S5 also agrees with the same views and maintains:

> *"Bank barrowings are very expensive due to high rates charged by banks which dol not leave any profit for businesses which may lead to loss and non-payment of debts."*

One of the interviewees, S4, elaborates the reason of the non-payment of the loan and interest amount in the follow words:

> *"With my small net profit, I am unable to repay my loans with hefty interest that* they *have charged me with."*

Due to the various reasons cited above, it has become clear that achieving credit facilities from the banks is extremely difficult in a volatile market, which compels the SMEs to seek alternative financing arrangements to ensure their survival and growth. In this regard, the SMEs' owners were asked about the alternative funding sources and the effective utilization of these financing. The bankers were also asked to provide their opinions on the accessibility of alternative funding sources.

4.4.1. Factoring

Interviewee S5 mentioned that his firm extensively uses the factoring line against the receivables. He stated that factoring ensures regular cash flow against credit sales being made on long-term basis. Banker B3 confirmed on a positive note that banks in UAE have a specialized departments that offer factoring service to SMEs based on their quality receivables. From this, it is evident that factoring is an effective credit arrangement that is widely used in the UAE. He further added:

> *"The factoring agent needs to be more confident in the integrity of the financials and the invoices being submitted for discounting."*

4.4.2. Credit line from suppliers

In addition, almost all the SMEs who were interviewed, including S1 who owns a trading firm and S8 maritime agency, mentioned the use of supplier credit arrangements. They are of the view that it is very effective since the access to this credit channel is relatively easier and quicker. This arrangement ensures payment obligation in smooth manner after providing decent credit period. In confirmation to this, respondent B3 claimed that the least expensive and most effective source of short-term financing is supplier credit followed by bank financing. He further added:

> *"Suppliers' credit is the most common financing scheme in the UAE and almost used by all SMEs."*

Despite having cheaper sources, S10 highlights the use of private borrowings to meet urgent requirements by paying hefty interest rate. For example, S6 uses his personal properties to avail business loan alongside the private borrowings from the open market. Interviewee S2 and S4, who are engaged in consulting business, have only sought for small size business loans designated for professionals. Even though Interviewee S2 has been in the industry for more than five years, it was difficult to avail credit facilities. Respondent B7 also narrated similar views and stated that business loans are difficult to obtain for firms without collaterals.

4.4.3. Venture capital (private equity)

Interviewee S3 uses venture capital arrangement as his business is niche and deals with a specialized product against which most bankers are not certain and aware. In this regard, bankers B4 and B6 point out that only few venture funding arrangements have been successfully structured in the UAE. Interviewee B4 indicates the reason:

> *"The investors hold the view that the market is highly risky and do not foresee any immediate potential for venture capitalists."*

Yet, respondent B8 contradicts by stating that venture capital is getting popularity now. In the UAE, venture capitalists are not looking at the start-up companies but established firms to help them go to the next level, as they are primarily concerned about their own return on investment. The venture capitalists provide assistance to the SMEs to grow into a midsize-corporate level entity.

4.4.4. Crowdfunding

Interviewee S10 stated that, besides loan from banks, private equity and crowd funding is also a good source of financing. However, these sources are helpful for types of SMEs which have a unique business model that appeals to an investing population that is looking for new kinds of businesses. For example, Interviewee S9 and S7 use private equity funding and crowd funding to raise finance for their entities. S9 firm is actively engaged in offshore marine operations associated with oil industry which is unique and specialized area in the shipping segment. They are seeking these expensive alternative funding because raising funds against the ongoing projects from formal channels are inadequate. Banker B3 adds that these options are rather more expensive than bank financing with lot of ambiguities and difficulties in meeting the lending terms. He suggested:

> *"A possible option is the private equity company which would bring in equity, but this is more expensive form of funding as compared to bank debt."*

Banker B7 and B8 are also of the same view and further add that crowdfunding is common in other global markets and not really an achievable option in the UAE. To a certain extent B2 also concurs with them and adds:

> *"When it comes to equity funding or crowd funding, all these finance providers are only interested in taking large exposures which can yield good returns and are not at all interested in investing in small SME entities."*

4.4.5. Standby letters of credits (SBLCs)

Interviewee B7 provides a unique option which is not mentioned by many SMEs' owners. He claimed that SMEs could benefit from using the Standby Letters of Credit's (SBLCs) wherein the owners of SMEs can mortgage the property in their home country and avail a loan in the country of residence.

Despite witnessing few effective alternative funding sources for SMEs, a senior banker (B6) claims that the UAE financial market is over-banked and SMEs do not require any additional funding sources. Interviewee B6 in his words strongly declares:

> *"There are no players in the market or non-bank financial institutions who can compete and fight with the banks because its highly over banked market with 50-51 banks on shore including DIFC, I do not see a reason why a third intermediary should come in and do this business."*

5. Discussions

In this section, the key findings derived from section 4 are discussed and linked with the literature review to identify and recognize the similarities and differences.

5.1. The obstacles in lending SMEs (bankers' perspective)

The results are analyzed with the research question asking for the main factors that have inhibited bankers to lend to SMEs in the UAE. The foremost among them are lack of collateral, unreliable audited financials, inadequate performance track record with the most important factor of being that of default and uncertain about bankruptcy procedures.'Skip risk', is not commonly prevalent in other parts of the globe, except in the UAE where many business owners are expatriates/ foreigners.

Lack of collateral is documented as a common impeding factor in the UAE as expressed by most bankers. This appears to be the most challenging and stressful problem for the SMEs across the globe. This finding is consistent with existing literature (Haron *et al.* 2013; Domeher *et al.* 2016). In UAE, most of the industries are engaged in trading and service activities, majority of them not owning any tangible collateral like many emerging nations, which eventually makes it difficult to obtain any financial assistance from the institutions. Banks in the UAE are reluctant to consider unsecured lending to the SMEs which is perceived riskier lending.

Another hindering element in UAE is the lack of transparency in maintaining accounting records which results in submission of unreliable financial statements by the SMEs for credit appraisal. This is in line with the literature (Eferakeya, 2014; Ghimire and Abo, 2013; Baby and Joseph, 2016). Maintaining required financial disciplines in the business operations and consequently reporting its true situation play a significant role in assessing the credit worthiness of an entity and thereby gaining confidence of the bankers. Since there is no professional regulatory body in the UAE to monitor the audit assignments undertaken by the auditors, the bankers are generally uncomfortable in relying on the audited financials submitted by the SMEs. They consider SMEs a risky exposure per-se in this volatile market and unreliable information willfully originating from SMEs creates the situation even more challenging as confirmed by the bankers.

Along with unaudited reports, the unimpressive and inadequate track record amplifies the obstacles in the way of lending to the SMEs (Aldaba, 2011; Garengo *et al.*, 2005). Decent credit history and a viable business model become paramount for any enterprise to raise finance from external agencies, otherwise, lending institutions generally refuse the lending (Baby and Joseph, 2016). However, the interviewees appreciated the recent steps taken by government to have a centralized database of all loans taken by SMEs along with the history of default.

The most challenging and unique factor in the context of the UAE is the skip-risk, which should now be a thing of the past with the enactment of bankruptcy law which protects different stakeholders in case of default. Most of the countries across the globe do have this law in place and thereby the fear of skip risk is not significantly prevalent there. All the bankers expressed their deep concern on this issue due to their past experience.

5.2. Alternative financing (perspective of SMEs' owners)

The research question concerning the availability of various alternative sources of funding are enquired from the perspective of SMEs' owners. The findings show that there are very limited funding arrangements available apart from banks, though the economy of UAE is driven by the contributions of SMEs. The SMEs' owners interviewed expressed that there is a need for more funding sources. However, few of the interviewees mention that due to excess number of banks in UAE market, other funding channels were not necessary. Currently, the popular alternative financing instruments are factoring and supplier's credit, with scope for venture capital in the innovative sector and crowd funding for halal products/ initiatives.

The most widely used credit method has been supplier's credit all over the world (Fatoki and Odeyemi, 2010) and the owners of SMEs in the UAE also confirm this argument. Another effective form of funding arrangement in the UAE is factoring (Klapper, 2006). Most of the lending institutions in UAE provide this cash facility based on factoring. Private equity plays the most effective role towards supporting SMEs across the globe according to existing literature (Maierbrugger, 2013). However, it is not widely used in the UAE. Central banks in few countries are issuing guarantees to facilitate the bankers to extend credit lines for SMEs (Vandenberg *et al.*, 2016; Rocha *et al.*, 2011). In UAE, specialized institutions formed by the government like Dubai SME and Khalifa Fund extend similar specialized services to SMEs which are owned by UAE nationals.

The findings also show that venture capital is another expensive form of financing arrangement wherein the investors mainly prefer projects yielding high returns which is consistent with the literature (Winton and Yerramilli, 2008). Though it is not widespread in UAE, however this source is recently becoming popular and few SMEs are successful in getting this funding arrangement to enhance their capital base. Crowdfunding, too, have the same status as venture capital, quite common in highly developed markets like the UK and the USA but has not yielded much impact in the UAE market. Although there could be scope for utilizing this source by SMEs in the future.

6. Conclusions

The research sought the perceptions of banks (supplier of funds) about the obstacles in the way of lending to SMEs. In addition, it also analyzes the views of owners of SMEs and bankers about the alternative financing instruments. The literature tends to focus on financing from the point of the SMEs (demand side); however, the gap exists to seek the perception of banks about the factors hindering the lending to the SMEs. This paper tries to fill the gap. Since there is scarcity of research on this critical issue, we adopted the primary method of interviews with eight bankers and ten owners of SMEs.

The results show that banks in UAE face serious challenges while lending to SMEs. The bankers complain about the deficiencies on the part of SMEs; however, the owners of SMEs express their discontent with non-cooperative approach of the lending institutions. The generalized analysis is that the existing financial infrastructure of UAE does not adequately support the fast-growing SME sector in the country.

Even though each bank is operating on its own policies and procedures concerning SMEs, the challenges seem to be identical. Among all, skip-risk is extremely serious and critical in UAE due to historical reasons and lack of familiarity with the bankruptcy law. In the absence of an effective bankruptcy law, bankers are not comfortable in extending unsecured lending considering the fact that SME market is primarily driven by expatriates who could leave the country without settling their outstanding loan. In case of an effective bankruptcy law in place, the customer would certainly stay back in the country, run the business operations, and fulfill the financial obligations without default. In addition, factors such as shortage of collaterals, unreliable un-audited financial statements and unsatisfactory performance track record also hinder banks from lending.

The interviewees appreciated the government for launching new programs to facilitate SMEs. The government on their part continue to extend their assistance in addressing the ongoing challenges being faced by the banks. The newly launched Al-Etihad Credit Bureau helps in providing accurate information about the borrowing profile of the SMEs to the bankers. This database enables banks to lend according to credit rating of the SMEs. Also, the Emirates Development Bank has recently launched a scheme whereby movable collaterals can be legally registered which facilitates banks to consider secured lending aggressively. In addition, the credit insurance scheme implemented by the government is yet another milestone, though the coverage currently extends to UAE nationals only, which provides confidence to the banks.

On the subject of alternative finance options existing in the UAE, the interviewees express that limited number of financings are available. Suppliers' credit and factoring are the two credit methods that play significant role for SMEs in meeting their financial requirements. Supplier credit is considered to be extremely popular and the least expensive available option. Factoring also plays a vital role in providing financial support against quality receivables. Designated departments attached with banks in UAE and few specialized institutions do provide the factoring facilities. The alternative funding of private equity, venture capital and crowd funding are not found very effective in the UAE market on the basis that these are more expensive ways of financing.

Although government and regulatory authorities continue to remain supportive, accomplishing mutually acceptable and beneficial solutions will provide ample scope for business expansion in this sector.

The bankers, SME owners, and policy makers can benefit from the insights given in this research paper the. Likewise, for the academicians this research study will assist immensely in understanding the core issues and will provide adequate insights taking the perspective of both bankers and SMEs. Future researchers such evaluate the impact of the bankruptcy law of 2016 on skip risk and the potential of crowdfunding in the Islamic economy or fintech solutions.

References

Aldaba, R.M. (2011) SMEs Access to Finance: Philippines, in Harvie, C., Oum, S., and Narjoko, D. (eds.), *Small and Medium Enterprises (SMEs) Access to Finance in Selected East Asian Economies*. ERIA Research Project Report 2010-14, Jakarta: ERIA: 291-350

Aras, A. (2017) Small and Medium Enterprises Financing, *United Nations: ESCAP*, available on-line at https://www.unescap.org/resources/small-and-medium-enterprises-financing

Baby, A. & Joseph, C.A.C. (2016) Bank Finance Challenges Faced by UAE SME Sector, *Arabian Journal of Business and Management Review*, S1: 005, doi:10.4172/2223-5833

Bădulescu, D. (2010) SMEs Financing: The Extent of Need and the Responses of Different Credit Structures, *Theoretical and Applied Economics*, vol. XVII, no. 7(548): 25-36

Bakhouche, A., Elchaar, R., & Emam, M. (2020). Survey of Financing Options and Key Challenges Faced by SMEs in the UAE: Economic Environment, Finance, and Regulatory Landscape. In H. Webb & H. Al Numairy (Eds.), Entrepreneurial Innovation and Economic Development in Dubai and Comparisons to Its Sister Cities (pp. 115-145). IGI Global. https://doi.org/10.4018/978-1-5225-9377-5.ch006

Beck, T., Demirguç-Kunt, A. and Maksimovic, V. (2008) Financing patterns around the world: Are small firms different? *Journal of Financial Economics*, vol. 89, no. 3:467-487

Berger, A.N. & Udell, G.F. (2002) Small Business Credit Availability and Relationship Lending: The Importance of Bank Organizational Structure, *The Economic Journal*, vol. 112, no. 477: F32-F53

Best, P.J., Buckby, S. & Tan, C. (2001) Evidence of the Audit Expectation Gap in Singapore. *Managerial Auditing Journal*, vol. 16, no. 3: 134-144

Blazy, R. & Weill, L. (2013) Why do banks ask for collateral in SME lending? *Applied Financial Economics*, 23(13), pp. 1109-1122

Buck, K. & Basrai, A. (2017) UAE Banking Perspectives. *KPMG*

Choe, C. (2007) The political economy of SME financing and Japan's regional bank problems, *Pacific-Basin Finance Journal*, vol. 15, no. 4: 353–367

Department of Economic Development - Government of Dubai (2013), *Dubai SME: The State of Small and Medium Enterprises (SMEs) In Dubai*, available on-line at https://sme.ae/SME_File/Files/SME_Report_English.pdf

Domeher, D., Musah, G. & Poku, K. (2016) Micro determinants of the extent of credit rationing amongst SMEs in Ghana, *International Journal of Social Economics*, vol. 44, no. 12: 1796-1817

Drexler, A., Fischer, G. & Schoar, A. (2014) Keeping It Simple: Financial Literacy and Rules of Thumb, *American Economic Journal: Applied Economics*, vol. 6, no. 2: 1-31

Dubai Chamber (2012) Guidelines for Enhancing SME Finance. *Business Guide Series: Dubai Chamber of Commerce and Industry*

Eferakeya, I. (2014) Nigerian Small and Medium Scale Enterprises' Access to Finance: What is the Story Since Bank Consolidation in 2005, *International Journal of Innovation and Applied Studies*, vol. 6, no. 4: 1111-1122

Emine, D. (2012) Financial Challenges That Impede Increasing the Productivity of SMEs in Arab Region, *Journal of Contemporary Management*, vol. 1, article ID 1929-0128-2012-02-17-16: 17-32, available on-line at https://web.archive.org/web/20180422063946id_/http://www.bapress.ca/jcm/jcm2012-2/Financial%20Challenges%20That%20Impede%20Increasing%20the%20Productivity%20of%20SMEs%20in%20Arab%20Region.pdf

Eniola, A.A. & Entebang, H. (2017) SME Managers and Financial Literacy. *Global Business Review*, vol. 18, no. 3, pp.559-576

Fatoki, O. & Odeyemi A. (2010) The determinants of access to trade credit by new SMEs in South Africa, *African Journal of Business Management*, vol. 4, no. 13, pp. 2763-2770

Fatoki, O.O. & Smit, A.V.A. (2011) Constraints to credit access by new SMEs in South Africa: A supply-side analysis, *African Journal of Business Management*, vol. 5, no. 4, pp.1413-1425

Fisher, C. (2010) *Researching and Writing a Dissertation: An Essential Guide for Business Students.* Pearson Education

Garengo, P., Biazzo, S. & Bititci, U.S. (2005) Performance Measurement Systems in SMEs: A review for a research agenda. *International Journal of Management Reviews*, vol. 7, no. 1: 25-47

Ghimire, B. & Abo, R. (2013) An Empirical Investigation of Ivorian SMEs Access to Bank Finance: Constraining Factors at Demand-Level. *Journal of Finance and Investment Analysis*, vol. 2, no. 4: 29-55

Gupta, N. and Mirchandani, A. (2018) Investigating entrepreneurial success factors of women-owned SMEs in UAE, *Management Decision*, vol. 56, no. 1: 219-232.

Haron, H., Said, S.B., Jayaraman, K and Ismail I. (2013) Factors Influencing Small Medium Enterprises (SMES) in Obtaining Loan, *International Journal of Business and Social Science,* vol. 4, no. 15: 182-195

Harrison, R.T. and Baldock, R. (2015) Financing SME growth in the UK: meeting the challenges after the global financial crisis, Venture Capital, vol. 17, no. 1&2: 1-6

Hasan, I., Jackowicz, K., Kowalewski, O. & Kozlowski, L. (2017) Do local banking market structures matter for SME financing and performance? New evidence from an emerging economy, *Journal of Banking and Finance*, vol. 79: 142-158

Hong, Z. & Zhou, Y. (2013) Can third party's collateral arrangements tackle the financing problem of small-medium enterprises? *China Finance Review International*, vol. 3, no. 4, pp. 353-380

Hudson, M., Smart, A. & Bourne, M. (2001) Theory and practice in SME performance measurement systems, *International Journal of Operations and Production Management*, vol. 21, no. 8: 1096-1115

Inegbenebor, A.U. (2006) Financing Small and Medium Industries in Nigeria - Case Study of the Small and Medium Industries Equity Investment Scheme (SMIEIS): Empirical

Research Findings, *Journal of Financial Management and Analysis*, vol. 19, no. 1, pp. 71-80

Kargwell, S. & Inguva, S. (2012) Factors Influencing the First Generation Entrepreneurs: An Analytical Study on the Graduates of UAE Universities, *International Journal of Business and Social Science*, vol. 3, no. 7, pp. 143-149

Kassem, M. (2017) UAE Central Bank looks to private equity to plug SME funding gap. *The National* [Online] available on-line at from: https://www.thenational.ae/business/banking/uae-central-bank-looks-to-private-equity-to-plug-sme-funding-gap-1.677934

Khalifa Fund (n.d.): Khalifa Fund for Enterprise Development, *Government of Abu-Dhabi*, available on-line at https://www.moec.gov.ae/en/khalifa-fund-for-enterprise-development

Khan, N. U., Sultan, W., & Khan, R. U. (2021). Financial Pattern of Small and Medium Enterprises (SMEs) of Pakistan. *Business and Economic Review*, vol. 13, no. 4: 1-23.

Klapper, L. (2006) The role of factoring for financing small and medium enterprises, *Journal of Banking & Finance*, vol. 30: 3111-3130

Kongolo, M. (2010) Job creation versus job shedding and the role of SMEs in economic development, *African Journal of Business Management*, vol. 4, no. 11: 2288-2295

Kothari, C.R. (2004) Research Methodology: Methods and Techniques, 2nd Edition, New Age International Publishers, New Delhi.

Kwaning, C.O, Nyantakyi, K. & Kyereh, B. (2015) The Challenges Behind SMEs' Access to Debts Financing in the Ghanaian Financial Market. *International Journal of Small Business and Entrepreneurship*, vol. 3, no. 2: 16-30

Lehner, O.M., Grabmann, E. and Ennsgraber, C. (2015) Entrepreneurial implications of crowdfunding as alternative funding source for innovations. *An International Journal of Entrepreneurial Finance*, vol. 17, no. 1-2: 171-189

Loumioti, M. (2011) *The use of intangible assets as loan collateral*, available on-line at https://msbfile03.usc.edu/digitalmeasures/loumioti/intellcont/theuseofintangiblesasloancollateral_final-1.pdf

Lynwood Consulting UAE (2017) *The Outlook for SMEs in 2017*, available on-line at https://www.lynwoodconsultinguae.com/outlook-smes-2017

Mackenzie, N. & Knipe, S. (2006) Research dilemmas: Paradigms, methods and methodology, *Issues in Educational Research*, vol. 16, no. 2: 193-205

Maierbrugger, A. (2013) Where to go when the banks say no, *Gulf-News Focus* [Online] available on-line at: https://gulfnews.com/gn-focus/personal-finance/sme-loans/where-to-go-when-the-banks-say-no-1.1162389

Mashreq Bank, UAE. Factoring available on-line at: https://www.mashreqbank.com/uae/en/corporate/emerging-corporates/factoring

Mayer, C., Schoors, K. & Yafeh, Y. (2004) Sources of funds and investment activities of venture capital funds: evidence from Germany, Israel, Japan and the United Kingdom, *Journal of Corporate Finance*, vol. 11, no. 3: 586-608

Mol-Gomez-Vazquez, A., Hernandez-Canovas, G. and Koeter-Kant, J. (2018) Legal and Institutional Determinants of Factoring in SMEs: Empirical Analysis across 25 European Countries, *Journal of Small Business Management*, vol. 56, no. 2: 312–329

Rocha, R., Farazi, S., Khouri, R. & Pearce, D. (2011) *The status of bank bending to SMEs in the Middle East and North Africa region: Results of a joint survey of the Union of Arab Bank and The World Bank*, available on-line at https://elibrary.worldbank.org/doi/epdf/10.1596/1813-9450-5607

Sacerdoti, E. (2005) Access to Bank Credit in Sub-Saharan Africa: Key Issues and Reform Strategies, *International Monetary Fund*, available on-line at file:///D:/%23Down/_wp05166.pdf

Saleem, Q. (2013). *Overcoming constraints to SME development in MENA countries and enhancing access to finance*, IFC Advisory Services in the Middle East and North Africa, available on-line at https://documents1.worldbank.org/curated/en/581841491392213535/pdf/113701-WP-Overcoming-constraints-IFC-Report-PUBLIC.pdf

Saleh, A.S. & Ndubisi, N.O. (2006) An Evaluation of SME Development in Malaysia, *International Review of Business Research Papers*, vol. 2, no. 1: 1-14

Samaranayake, D.A. (2012) Ethics in Qualitative Research: A View of the Participants' and Researchers' World from a Critical Standpoint, *International Journal of Qualitative Methods*, vol. 11, no. 2: 64-81

Saunders, M., Lewis, P. & Thornhill, A. (2016) *Research methods for business students*, 7th Edition, Harlow: Pearson Education

Schiliro, D. (2015) Innovation in Small and Medium Enterprises in the United Arab Emirates. *International Journal of Social Science Studies*, vol. 3, no. 5: 148-160

Steijvers, T. (2009) Collateral and Credit Rationing: A Review of Recent Empirical Studies as a Guide for Future Research, *Journal of Economic Surveys*, vol. 23, no. 5: 924-946

Stemler, A.R. (2013) The JOBS Act and crowdfunding: Harnessing the power - and money - of the masses, *Business Law and Ethics Corner*, vol. 56: 271-275

Teddlie, C. & Yu, F. (2007) Mixed Methods Sampling: A Typology with Examples, *Journal of Mixed Methods Research*, vol. 1, no. 1: 77-100

Thomas, D.R. (2006) A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation*, vol. 27, no. 2: 237-246

Townsend, S. (2017) Emirates Development Bank pledges Dh450m of funding to SMEs for 2018. *The National* available on-line at: https://www.thenational.ae/business/emirates-development-bank-pledges-dh450m-of-funding-to-smes-for-2018-1.685125

Vaddepalli, S. (2014) Factoring: An Alternate Payment Method in International Trade. *International Journal of Business Quantitative Economics and Applied Management Research*, vol. 1, no. 3: 49-60

Vandenberg, P., Chantapacdepong, P. & Yoshino, N. (2016) SMEs in Developing Asia: New Approaches to Overcoming Market Failures, Asian Development Bank Institute, available on-line at https://www.adb.org/publications/smes-developing-asia-new-approaches-overcoming-market-failures

Wang, P. & Yang, Q. (2014) Analysis on Financing of Small and Micro Enterprises, *Management and Engineering*, vol. 15: 45-50

Winton, A. & Yerramilli, V. (2008) Entrepreneurial finance: Banks versus venture capital, *Journal of Financial Economics*, vol. 88, no. 1: 51-79

Woiceshyn, J. & Daellenbach, U. (2018) Evaluating inductive vs deductive research in management studies: Implications for authors, editors, and reviewers, *Qualitative Research in Organizations and Management: An International Journal*, vol. 13, no. 2: 183-195

Yaseen, Z.K. (2014) The Unanticipated Challenges Facing Small-Business Owners in the UAE. *British Journal of Economics, Management and Trade*, vol. 4, no. 10: 1577-1584

Zairani, Z. & Zaimah, Z.A. (2013) Difficulties in Securing Funding from Banks: Success Factors for Small and Medium Enterprises (SMEs), *Journal of Advanced Management Science*, vol. 1, no. 4: 354-357

Zarrouk, H., Sherif, M., Galloway, L. & El Ghak, T. (2020) Entrepreneurial orientation, access to financial resources and SMEs' business performance: The case of the United Arab Emirates., *The Journal of Asian Finance, Economics and Business*, vol. 7, no. 12: 465-474

SECTION 11 Accounting profession

Accountants' Digital Skills Determined by the Automation-Driven Evolution of the Profession

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The Use of New Emerging Technologies and the Transformation of the Tax Environment Through Digitization

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Accountants' Digital Skills Determined by the Automation-Driven Evolution of the Profession

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Abstract: *This study aims to examine the changes in the set of digital skills of accountants in the context of the automation-driven evolution of the profession. Currently, an increased level of adoption of automation-based solutions can be observed in almost all (if not all) industries. To create competitive advantages, companies started to grasp the benefits of Robot Process Automation and Intelligent Process Automation solutions. Thus, the set of digital skills accountants must demonstrate needs to be updated to allow them to continue to support organizations. By wielding a cross-sectional approach, we examine the evolution of syllabi defined by three relevant international professional accounting bodies (IPABs), employing an inductive approach to conduct a content analysis. We analyzed the curricula for the period 2012 – 2022 to identify the changes over the last decade. The main findings are that there is an increase in the level of digital requirements, especially in the case of automation-based competencies as the role of the accountants is migrating towards becoming an advisor of the management. Our study has implications for the accounting education at all levels. This research deepened the understanding of the role that IPABs plays in supporting the profession, with a series of theoretical implications as it addresses the evolution of the digital set of skills in the automation-driven evolution of the accounting profession.*

Keywords: *Accounting profession; international professional accounting bodies; digital skills; Robot Process Automation; Intelligent Process Automation.*

1. Introduction

Automation solutions are leading to changes in the digital skill set required of accounting practitioners. The main objective of this paper is to examine the response of international professional accounting bodies (IPABs) in the automation-driven evolution of the profession.

The role of IPABs in maintaining the profession's relevance by constantly updating the skill set required of accounting practitioners has been highlighted previously in the literature (King and Davidson, 2009), particularly in the context of Industry 4.0 (Tsiligiris and Bowyer, 2021). Given the ongoing collaboration between the IPABs and the business environment, the requirements for the certification of accounting professionals provide clear directions on the future skills needed within the profession.

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The need for continuous development and updating of skills has been highlighted over time by IPABs as well (ACCA, 2012), emphasizing that if accountants fail to work effectively with the new Information and Communication Technologies (ICTs) used by companies, both individual practitioners and the profession risk extinction. In response to the digitization of the profession, the International Federation of Accountants (IFAC) published in 2014 a new version of the International Education Standard (IES) 2, where the IT section was extended.

Automation solutions significantly diminish the level of redundant activities and reduce the frequency of errors in accounting processes. As practitioners are the primary users of automation solutions, they must demonstrate the necessary skills to grasp the benefits of technologies such as artificial intelligence (AI), blockchain, Big Data, and cloud computing. While examining the evolution of the accounting profession through digitalization, recent studies focused primarily on the role's evolution from the practitioners' and organizations' points of view (Coman *et al.*, 2022; Gulin *et al.*, 2019) and have investigated the impact within specific activities (Varaniūtė *et al.*, 2022), researchers emphasizing the need to continue analyzing how digitalization determines the evolution of the accountants' role (Bhimani, 2020). Tsiligiris and Bowyer (2021) conducted a review of technical publications created by significant IPABs in the accounting field to examine the impact generated by Industry 4.0 in the set of skills; however, the professional bodies do not always include all these skills in their curricula due to limitations such as the low-adoption level of some technologies. Moreover, this approach does not capture the evolutionary perspective. Thus, the main objective of this paper is to analyze the evolution of the requirements defined by the IPAB in the context of automation solutions. In order to achieve this objective, a content analysis of the syllabi designed by three important IPABs (Association of Chartered Certified Accountants - ACCA, Institute of Chartered Accountants in England and Wales - ICAEW, and Chartered Institute of Management Accountants - CIMA), analyzing the data collected longitudinally and comparatively. Thus, by identifying the digital skills that IPABs consider necessary in the profession, we can examine the extent to which future certified practitioners can leverage the benefits of automation-driven ERPs.

This paper is divided into four sections: the first section reviews the literature on the leading technologies wielded in the accounting process along with the automation-based solutions, followed by the research methodology section, the results of the content analysis carried out, and finally, we present in the last section the conclusions, limitations, and future research directions.

2. Literature review

As a result of ICT developments, the functionality of information systems has progressively diversified: in the 1960s, they had only the role of automating transactional processes at the operational level; in the 1970s, decision support and reporting systems gave the information system a management role; in the 1980s, with micro-computers, the notions of informatics and end-user appeared; during the 1990s, with the development of telecommunication networks and the transmission of numerical information, technological evolution extended its effects outside the organization, within inter-organizational information systems; in the 2000s he Internet has marked a particular stage in the development: E-business support systems have been developed based on the Internet infrastructure, and more recently E-management systems; today companies adopt robotic process automation (RPA) and Intelligent Process Automation (IPA). At each stage, technological and organizational developments profoundly changed the organization's information system, i.e., the set of information flows and the organizational structure in which they were embedded (Dumitru, 2009).

ICT significantly changes accountants' work and, consequently, the accounting education. Accountants are represented by associations that are in charge of "the oversight of membership, knowledge, skills, conduct, practice, and standards of that profession" (Ionescu-Feleagă *et al.*, 2022, p.2). Maintaining actual the accountants' skill set is achieved through continuously updating curricula. One of the challenges is the increasing digitalization within the profession, meant to continue ensuring its relevance (Gușe and Mangiuc, 2022). For instance, in response to the educational requirements brought by IES 2 "Initial Professional Development – Technical Competence" (applicable from 2015), the IPABs started modifying the curricula, integrating more and more IT elements. They focused mainly on emerging technologies at that time, such as Big Data, cloud computing and artificial intelligence (AI), but also took into account issues such as cyber security. The latest version of IES 2, applicable from 2021 (IFAC, 2019), expands the IT section to cover the entire accounting process from data analysis to reporting using IT solutions.

Digitalization is "a prominent membership service" (Ionescu-Feleagă *et al.*, 2022:9). In this regard, the education providers have to support the evolution (Gușe and Mangiuc, 2022) as opposed to digital exclusion. Automation of accounting processes through RPA and IPA solutions involves interaction between the software robot and any of the applications or systems used by the human resource. Thus, accounting practitioners must have sufficient knowledge not only about RPA and IPA but also about other technologies and IT solutions used in conjunction with the automation-based solutions. The complexity and versatility of RPA and IPA solutions have enabled various automation-based applications to be developed in recent years and used in conjunction with emerging technologies (such as AI, Big Data, cloud computing, and blockchain) which help them process data beyond the human capacity (Gușe and Mangiuc, 2022). Thus, this section presents the literature highlighting the link between RPA solutions and other technologies used to perform accounting processes.

2.1. AI

RPA solutions are robotic software applications designed to perform a series of standard, simple, well-defined processes (Dumitru and Stănculescu, 2020) for which they have been programmed. Although these IT solutions can reduce redundant processes in organizations used without other emerging technologies, the use of RPA solutions together with AI contributes to a new generation of robots with new benefits. The relevant literature has named this technological combination Intelligent Process Automation (IPA) and Cognitive Robotic Process Automation (CRPA) (Martins *et al.*, 2020; Zhang, 2020).

The complexity of AI thus enables the development of new IPA applications that can be leveraged in accounting processes to reduce costs, increase the accuracy and quality of reporting, process documents faster, and reduce errors (Kokina and Blanchette, 2019). One such example, eloquent in the financial-accounting field, is an IPA solution developed for Accenture Global Solutions, one of the largest companies operating in the field of service outsourcing. The solution proposed by Zambetti *et al.* (2020) aims at automating payment processing by integrating the solution into the beneficiaries' ERP architecture.

2.2. Big Data

Processes for analyzing information such as Big Data have emerged due to the need to generate relevant data in the context of a significant increase in the volume of structured and unstructured information, where analyzing it using traditional methods is no longer a viable option due to the level of complexity. Because the collected information is not homogeneous and there are no logical links for its valorization through relational databases, it is processed through non-relational databases, which allow obtaining relevant results defined by the following characteristics: volume, velocity, variety, value and complexity (Gandomi and Haider, 2015; Gepp *et al.*, 2018; Kaisler *et al.*, 2013; Zikopoulos *et al.*, 2011). Although initially, only the first three elements were considered essential, the last two have been added over time due to the evolution of the applications and data used. Nevertheless, to wield the benefits associated with Big Data, accountants must demonstrate adequate analytical skills (Al-Htaybat and von Alberti-Alhtaybat, 2017).

Using RPA solutions to extract relevant information from a significant volume of varied and complex data leads to cost savings, identification of new opportunities and risks, reduced error rates, and improved real-time reporting processes (Warren *et al.*, 2015). An example of using an RPA and computer neuro-linguistic programming solution for automated collection and analysis of a large and varied volume of data is presented by Villar and Khan (2021), outlining the benefits of automating media monitoring of individuals and organizations so that financial institutions can comply with requirements defined by supervisory bodies.

2.3. Cloud computing

Cloud computing platforms allow users to access providers' services, IT solutions, and hardware devices at any time, with lower costs, and in a more flexible manner, in terms of scalability (Gușe and Mangiuc, 2022). According to data provided by Eurostat (2021), 42% of companies in the European Union use cloud computing platforms, mostly for email services (79%) but also for financial-accounting solutions (48%). In the report published by ACCA (2013a), cloud computing platforms were considered at that time to be among the emerging technologies that can bring significant changes to the accounting profession, as per the lower costs (as opposed to infrastructure acquisition), flexibility, more efficient communication with third parties, and real-time reporting.

The Software as a Service (SaaS) model refers to the most widely used type of cloud computing service, which provides customers with access to applications and services available directly on the provider's platform. Most accounting applications can be successfully integrated on this type of platform (Belfo and Trigo, 2013; Dimitriu and Matei, 2014), where RPA solutions can also be included. Thus, in this context, companies can use automation-based solutions without additional investments in the existing infrastructure.

2.4. Blockchain

Distributed ledgers, more commonly known as blockchain, a term first defined by Nakamoto (2008), the developer of this technology, is a ledger of transactions or blocks, encrypted and anonymized (Hughes *et al.*, 2019), which can be used in accounting processes to develop a verifiable and transparent ecosystem, but also to improve audit procedures, thus defining more accurate assurance systems (Dai and Vasarhelyi, 2017). In recent years, various applications based on blockchain have been developed to improve accounting processes and activities, such as transaction reconciliation (Jayaram *et al.*, 2018) and automated invoice preparation and issuance (Hu, 2021).

The Big 4 companies, which over the past decades became pioneers in the digitization of the profession, created platforms that are based on blockchain and AI, along with RPA solutions, intending to address clients' needs for a digital ecosystem that is based on trust, transparency, and efficiency (Zhang *et al.*, 2020). One such example is the EY Blockchain Analyzer, which can be used not only for data exploration and visualization but also for account reconciliation, smart contract risk identification and analysis, and tax reporting (EY, 2022). At the same time, the use of decentralized registries in conjunction with AI solutions enables the development of new applications for data security by automatically identifying advanced persistent threats and recording detected items in a distributed registry (Rahman *et al.*, 2022).

3. Research method

This research aims to answer the following questions:

- RQ1. *What are the main changes concerning the IT elements included in the curricula for certification defined by IPABs in the context of the increased level of automation?*
- RQ2. *What are the differences concerning the IT elements included in the certification curricula of IPABs?*

In order to answer the research questions, the curricula of the following IPABs with a global presence were analyzed:

- Association of Chartered Certified Accountants (ACCA);
- Institute of Chartered Accountants in England and Wales (ICAEW); and
- Chartered Institute of Management Accountants (CIMA).

ACCA represents the largest accounting association, being present in over 180 countries. It defines the digital expertise as essential for its members. "Harnessing the power of digital technologies to shape the future of the profession" is embedded in ACCA's purpose (ACCA, 2022: 3). Present in over 140 countries, ICAEW has a long history in promoting the development of IT skills within the profession, particularly concerning continuing education programmes. Mastering technology and data is one of the organization's strategic themes (ICAEW, 2021). Moreover, ICAEW is "redefining the data skills expected of, and possessed by, [their] members" (ICAEW, 2021: 45). CIMA is the first and largest institute specializing in the certification of management accounting professionals. It acknowledges the search of young generations for "a combination of digital skills and competencies" (CIMA, 2021: 11).

The curricula analyzed referred to the period 2012 – 2022 in order to identify the main changes over the last decade, considering the IES 2 updates which also led to updates in the skills set.

The methodological approach is based on content analysis because, as when it is used to extract qualitative information from the syllabi, it "reduces ambiguity and develops clear maps of curricula" (Yap *et al.*, 2014, p. 569), being one of the most widely used techniques in the social sciences (Hopkins and King, 2010). Also, given the proposed comparative examination, content analysis allows for identifying similarities and differences (Holder *et al.*, 2013). Due to the fact that this technique allows for the exploration of manifest content - clearly visible components, but also latent content - the meaning that can be determined by manifest content (Saunders *et al.*, 2019), it allows for an in-depth analysis not only of the technologies, but also of other aspects that cannot be quantified.

This approach involves collecting information, followed by coding and assigning the data to specific categories. This process can be carried out either by using computer systems or manually. In this research we employed the manual examination as this approach is more reliable in the case of qualitative assessments (Beattie *et al.*, 2004), reducing the risks of disregarding important information (Sjøvaag *et al.*, 2012; Syyrilä *et al.*, 2021).

Each of the certifications offered by the IPABs analyzed requires students to pass a series of examinations in different subject areas. Given that no specific examinations focus exclusively on elements of IT, the syllabuses for each examination were analyzed to identify the digital skills required by practitioners. The qualification analyzed were the following: the ACCA qualification – provided by ACCA, the Associate Chartered Accountant (ACA) – provided by ICAEW, and the Chartered Global Management Accountant (CGMA) - provided by CIMA.

Table 1. **List of exams containing IT elements**

ACCA	CIMA	ICAEW
Business and technology[1]	Advanced management accounting (P2)	Assurance
Performance management	Management accounting (P1)	Audit and assurance
Strategic business leader[2]	Managing finance in a digital world (E1)[3]	Business planning
Strategic business reporting	Managing performance (E2)[4]	Business strategy and technology[5]
	Risk management (P3)	Business, technology and finance[6]
	Strategic management (E3)	Corporate reporting
		Management information
		Strategic business management

Notes: [1]Before 2020 – Accountant in Business; [2]Before 2018 – Business Analysis; [3]Before 2019 – Organizational Management; [4]Before 2019 – Project and Relationship Management; [5]Before 2018 – Business Strategy; [6]Before 2018 – Business and Finance

(*Source:* Authors' compilation)

4. Results and discussions

Unlike IES 2, where no specific technologies are listed, the general term ICT being used instead, a range of technologies used in the accounting profession were identified in the curricula examined. At the beginning of the period analyzed, given the fact that many of the technologies currently in use were emerging at that time, being used by only a few large companies that have chosen to became pioneers the digitization of accounting activities, the curricula set out general requirements for the digital skills to be demonstrated by future certified professionals, such as:

- "Define and identify the main characteristics of transaction processing systems; management information systems; executive information systems; and enterprise resource planning systems." (ACCA, 2013b: 10);
- "Discuss ways of organizing and managing information system activities in the context of the wider organization" (CIMA, 2008: 15);
- "Identify, in the context of accounting and other systems, the issues surrounding: information processing, information security, [and] information management" (ICAEW, 2013: 13).

As can be seen from the comparative analysis of technologies identified in the curricula (Table 2) defined for the three analyzed qualifications, CIMA has played the role of pioneer, both in terms of emerging technologies and in terms of the volume of elements identified in the curriculum. At the same time, CIMA includes in the syllabi technologies that are not used in the accounting field, such as 3-D printing, but which have a significant potential of changing certain areas of business, considering that it is vital for practitioners to objectively understand and assess the impact of disruptive technologies on business activities.

Table 2. **Technologies identified in the curricula**

Technologies	ACCA	CIMA	ICAEW
Databases		✓	
Big Data	✓	✓	✓
Cloud computing	✓	✓	✓
Data mining		✓	
Data deposits		✓	
FinTech	✓		✓
AI	✓	✓	✓
Internet of Things (IoT)		✓	✓
ETL processes		✓	
RPA	✓	✓	✓
Blockchain	✓	✓	✓
CRM systems	✓	✓	
ERP systems	✓	✓	
Expert systems (KMS)		✓	
Accounting information systems	✓	✓	✓
Business Intelligence solutions		✓	✓
Data analysis solutions	✓	✓	✓
Computer-assisted audit techniques (CAATs)		✓	
Mobile technologies	✓	✓	
Wireless technologies	✓	✓	

(*Source*: Authors' compilation)

In addition to the technologies identified, all three IPABs include in their curricula aspects related to information security, emphasizing that practitioners need to have sufficient knowledge to prevent and identify cybersecurity incidents, being able to recommend mitigations and promote an adequate cyber security behavior.

As presented in Figure 1, the IPABs introduced technologies into their curricula predominantly in recent years due to increased adoption by companies.

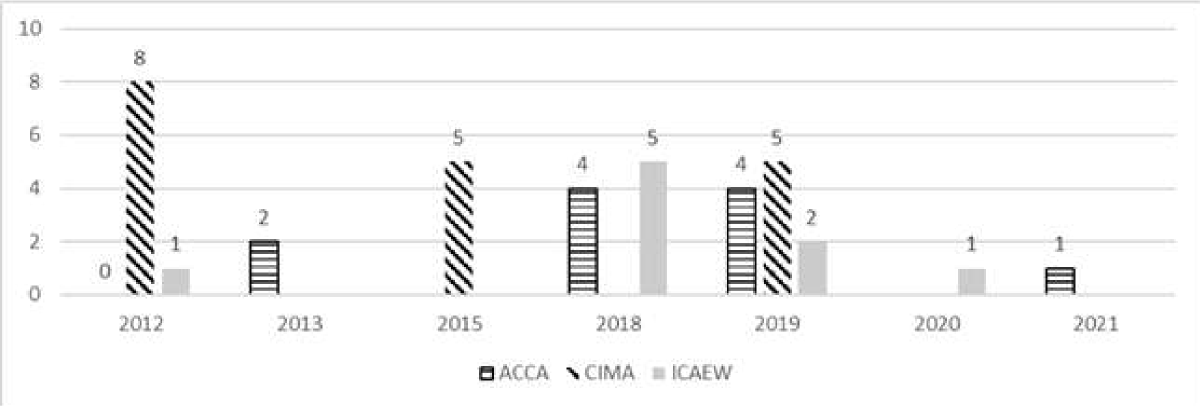

Figure 1. **Comparative longitudinal evolution**
(*Source*: Authors' compilation)

Even though CIMA included most of the IT elements in the curriculum before 2012, the competencies did not refer to emerging technologies such as Big Data, cloud computing, AI and blockchain, which were added in the 2015 and 2019 syllabi.

The impact caused by the IT systems used to perform accounting activities is highlighted over time in the study plans. The generic term AI used in Table 2 refers to several subfields of AI, such as machine learning techniques, neural networks and robotics, as the literature defines this generic term (Duan *et al.*, 2019), although some of the IPABs present AI distinctly from machine learning and IPA. Moreover, in addition to the importance of AI-related skills, which is supported by all three IPABs, CIMA emphasizes the need for practitioners to be able to define work environments where humans and robots to collaborate.

The skills that accounting professionals need to demonstrate in the context of the increased adoption of automation solutions, identified in the curricula, are presented in Table 3.

Table 3. **Required skills**

IPAB	Skills
ACCA	Present the potential benefits of using automation solutions in decision-making process to support the achieving of business objectives. Assess the risks of using RPA solutions. Describe how automation solutions can affect the role and effectiveness of accounting practitioners.
CIMA	Present and explain automation technologies. Present the skills needed by practitioners in the context of using RPA solutions. Understand relevant technologies and their impact on organizations.

IPAB	Skills
	Define the role of RPA systems in identifying new business opportunities and reducing costs. Highlight the impact of technological developments on organizations. Outline the legal and social implications of using digital solutions given personal data security, privacy and digital responsibility.
ICAEW	Identify the effect of technological developments that can be used in accounting processes or directly impact processes and/or the profession. Specify the features and usefulness of automation solutions. Analyze and evaluate RPA solutions. Identify the risks of automating processes and assess the potential impact on financial statements and audit engagements. Evaluate digital strategies. Formulate proposals and advise on technologies that can support business strategy. Assess financial and operational data generated by management information systems in the light of the fundamental characteristics of accounting information in the context of process automation. Assess the impact on financial performance of technological developments such as RPA solutions.

(*Source*: Authors' compilation)

Regarding the competencies required of accounting practitioners, there are differences between the three IPABs analyzed. As can be seen, while the curricula defined by ACCA focus mainly on the benefits and risks associated with the use of automation solutions and the impact of these solutions on practitioners, CIMA and ICAEW consider it necessary for practitioners to be able to identify through automation new opportunities for the development of the business environment, thus emphasizing the paradigm shift in the accountants' role which seems to migrate towards the role of advisor to management, as foreseen by the literature long before the advent of the Industry 4.0 revolution (Andreassen, 2020; Siegel, 2000). Another critical digital skill identified only in the CGMA curricula is that accounting professionals should have a clear understanding of the impact of the use of automation in terms of legal and social implications.

5. Conclusions

The research aimed to investigate the digital skills considered vital for future certified practitioners by international accounting professional bodies in the context of an increased level of automation in the accounting profession.

The first significant finding of the content analysis was that, longitudinally, an increase in the level of digital requirements from accountants could be observed. At the beginning of the analyzed period, the curricula did not refer to specific technologies, although many of the technologies discussed in this paper were already reviewed in the literature (Baldwin *et al.*, 2006; Du and Cong, 2010; Horngren *et al.*, 2002). Technologies such as AI, big data, cloud computing, RPA, and blockchain became part of the curriculum as their adoption increased over time, emphasizing the close collaboration between IPABs and the business environment. In the case of the curricula defined by CIMA, we identified the promotion of understanding of technologies that were not used in the accounting process but can affect business activities, thus emphasizing changes in the role of accounting practitioners, who are being encouraged to focus increasingly on management advisory activities.

The second significant finding of the study was highlighted by the comparative analysis of the curricula defined by the three professional bodies analyzed. In the context of the increased level of digitization within the profession, some IPABs emphasize the idea that practitioners need to have sufficient knowledge regarding the technologies that directly impact the profession so that they can propose digital strategies to maintain or increase the companies' competitive advantage. At the same time, the examination of the curricula also emphasizes the importance of information security and how practitioners can identify, mitigate, and prevent data security incidents. In terms of technologies included in the curricula, no significant differences have been identified, and the same is true for the periods in which the competencies regarding emerging technologies have been included.

The results of the present study emphasize that the impact of the automation-driven evolution of the accounting profession has been significant, as demonstrated by the inclusion in the curricula of competencies in RPA applications and technologies that can be used in conjunction with these solutions. Thus, this research contributes to a better understanding of digitalization in the context of the accounting profession.

Although the current research was limited exclusively to the curricula defined by three IPABs, as most of the higher education institutions offering study programs in accounting are accredited by the analyzed professional bodies, we thus consider that we were able to collect sufficient information to analyze the evolution of the digital skills required from current and future accounting practitioners. Future research could address the impact of the IPABs on the continuous development of digital competencies of their members, their application in practice, and the consequences on their work.

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References

ACCA (2012) „Technology trends: their impact on the global accountancy profession", available on-line at https://www.accaglobal.com/uk/en/technical-activities/technical-resources-search/2013/may/technology-trends.html, accessed 22 August 2022

ACCA (2013a) „Digital Darwinism: thriving in the face of technology change", available on-line at https://www.accaglobal.com/content/dam/acca/global/PDF-technical/futures/pol-afa-tt2.pdf, accessed 02 September 2022

ACCA (2013b) „Performance Management (F5) June 2013 to June 2014"

ACCA (2022) „Integrated annual report for the year ended 31 March 2022", available on-line at https://www.accaglobal.com/gb/en/about-us/annual-reports/annual-report.html, accessed 08 April 2023

Al-Htaybat, K. & von Alberti-Alhtaybat, L. (2017) „Big Data and corporate reporting: Impacts and paradoxes", *Accounting, Auditing & Accountability Journal*, vol. 30, no. 4: 850-873

Andreassen, R.I. (2020) „Digital Technology and Changing Roles: A Management Accountant's Dream or Nightmare?", *Journal of Management Control*, vol. 31: 209–238

Baldwin, A.A., Brown, C.E. & Trinkle, B.S. (2006) „Opportunities for artificial intelligence development in the accounting domain: the case for auditing”, *Intelligent Systems in Accounting, Finance & Management: International Journal*, vol. 14, no. 3: 77-86

Beattie, V., McInnes, B. & Fearnley, S. (2004) „A methodology for analysing and evaluating narratives in annual reports: a comprehensive descriptive profile and metrics for disclosure quality attributes”, *Accounting Forum*, vol. 3, no. 28: 205-236

Belfo, F. & Trigo, A. (2013) „Accounting information systems: Tradition and future directions”, *Procedia Technology*, vol. 9: 536-546

Bhimani, A. (2020) „Digital data and management accounting: why we need to rethink research methods”, *Journal of Management Control*, vol. 31, no.1-2: 9-23.

CIMA (2008) „Qualification structure and syllabus CIMA Chartered Management Accounting Qualification 2010”

CIMA (2021) „CIMA's annual report and financial statements”, available on-line at https://www.cimaglobal.com/About-us/Annual-Review-and-Report--Statements/, accessed 08 April 2022

Coman, D.M., Ionescu, C.A., Duică, A., Coman, M.D., Uzlau, M.C., Stanescu, S.G. & State, V. (2022) „Digitisation of accounting: The premise of the paradigm shift of role of the professional accountant”, *Applied Sciences*, vol. 12, no. 7: 3359

Dai, J. & Vasarhelyi, M.A. (2017) „Toward blockchain-based accounting and assurance”, *Journal of Information Systems*, vol. 31, no. 3: 5-21

Dimitriu, O. & Matei, M.A. (2014) „New Paradigm for Accounting through Cloud Computing”, *Procedia Economics and Finance*, vol. 15: 840–846

Du, H. & Cong, Y. (2010) „Cloud computing, accounting, auditing, and beyond”, *The CPA Journal*, vol. 80, no. 10: 66-70

Duan, Y., Edwards, J. S. & Dwivedi Y. K. (2019) „Artificial Intelligence for Decision Making in the Era of Big Data–Evolution, Challenges and Research Agenda”, *International Journal of Information Management*, vol. 48: 63–71

Dumitru, V.F. (2009) „Impactul tehnologiilor informaționale asupra organizării și funcționării sistemului financiar-contabil al firmei”, PhD thesis

Dumitru, V.F. & Stănculescu, S.M. (2020) „Initial Thoughts on the Impact of Robotic Process Automation on the Accounting Department”, in: R. Pamfilie, V. Dinu, L. Tăchiciu, D. Pleșea, C. Vasiliu eds. *6th BASIQ International Conference on New Trends in Sustainable Business and Consumption*. Messina, Italy, 4-6 June 2020. Bucharest: ASE, pp. 105-112

Eurostat (2021) „Cloud computing used by 42% of enterprises”, available on-line at https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211209-2 accessed 02 September 2022

EY (2022) „EY announces general availability of EY Blockchain Analyzer: Reconciler”, available on-line at https://www.ey.com/en_gl/news/2022/05/ey-announces-general-availability-of-ey-blockchain-analyzer-reconciler, accessed 02 September 2022

Gandomi, A. & Haider, M. (2015) „Beyond the hype: Big data concepts, methods, and analytics”, *International Journal of Information Management*, vol. 35, no. 2: 137-144

Gepp, A., Linnenluecke, M.K., O'Neill, T.J. & Smith, T. (2018) „Big data techniques in auditing research and practice: Current trends and future opportunities”, *Journal of Accounting Literature*, vol. 40: 102-115

Gulin, D., Hladika, M. & Valenta, I. (2019), „Digitalization and the Challenges for the Accounting Profession”, *ENTRENOVA-ENTerprise REsearch InNOVAtion*, vol. *5, no.* 1: 428-437

Guşe, G.R. & Mangiuc, M.D. (2022) „Digital Transformation in Romanian Accounting Practice and Education: Impact and Perspectives”, *Amfiteatru Economic*, vol. 24, no. 59: 252-267

Holder, A.D., Karim, K.E., Lin, K.J. & Woods, M. (2013) „A content analysis of the comment letters to the FASB and IASB: Accounting for contingencies”, *Advances in Accounting*, vol. 29, no. 1: 134-153

Hopkins, D. & King, G. (2010) „A Method of Automated Nonparametric Content Analysis for Social Science”, *American Journal of Political Science*, vol. 54, no. 1: 229-247

Horngren, C.T., Bhimani, A., Datar, SM & Foster, G. (2002) *Management and cost accounting*. Harlow: Financial Times-Prentice Hall

Hu, X. (2022) *System and Method for Managing Accounting and Billing using Blockchain Technology*. US Patent Application 17/372,209

Hughes, A., Park, A., Kietzmann, J. & Archer-Brown, C. (2019) „Beyond Bitcoin: What blockchain and distributed ledger technologies mean for firms", *Business Horizons*, vol. 62, no. 3: 273-281

ICAEW (2013) „Latest evolution of the ACA syllabus 2014 certificate and professional levels"

ICAEW (2021) „Where our profession makes a difference. ICAEW Annual report and financial statements 2021", available online at https://www.icaew.com/about-icaew/who-we-are/annual-report, accessed 8 April 2023

International Federation of Accountants (2014) „International Education Standard (IES) 2 - Initial Professional Development – Technical Competence (Revised)" available on-line at https://www.ifac.org/system/files/publications/files/IAESB-IES-2-%28Revised%29_0.pdf accessed 22 August 2022

International Federation of Accountants (2019) „Handbook of International Education Pronouncements" available on-line at https://www.ifac.org/system/files/publications/files/Handbook-of-International-Education-Standards-2019.pdf accessed 22 August 2022

Ionescu-Feleagă, L., Dragomir, V. D., Bunea, Ș., Stoica, O.C. & Barna, L.E.L. (2022) „Empirical Evidence on the Development and Digitalization of the Accounting and Finance Profession in Europe", *Electronics*, vol. 11, no. 23: 3970

Jayaram, A., Abidi, M.T., Mandell, D.C. & Sugavanam, S.K. (2018) *Multiparty reconciliation systems and methods*. US Patent Application 15/702.684

Kaisler, S., Armour, F., Espinosa, J.A., & Money, W. (2013) „Big data: Issues and challenges moving forward", in *Proceedings of the 46th Hawaii International Conference on System Sciences* (995-1004), Hawaii

King, R. & Davidson, I. (2009) „University accounting programs and professional accountancy training: Can UK pragmatism inform the Australian debate?", *Australian Accounting Review*, vol. 19, no. 3: 261-273

Kokina, J. & Blanchette, S. (2019) „Early evidence of digital labor in accounting: Innovation with Robotic Process Automation", *International Journal of Accounting Information Systems*, no. 35

Martins, P., Sá, F., Morgado, F. & Cunha, C., (2020) „Using machine learning for cognitive Robotic Process Automation (RPA)", in 2020 1*5th Iberian Conference on Information Systems and Technologies (CISTI)* (pp. 1-6). IEEE.

Nakamoto, S. (2008) „Bitcoin: A peer-to-peer electronic cash system", *Decentralized Business Review*

Rahman, Z., Yi, X. & Khalil, I. (2022) „Blockchain based AI-enabled Industry 4.0 CPS Protection against Advanced Persistent Threat", *IEEE Internet of Things Journal,* vol. 10, no.8: 6769-6778

Saunders, M., Lewis, P. & Thornhill, A. (2019) *Research Methods for Business Students*. Pearson Education

Siegel, G. (2000) „The image of corporate accountants", *Strategic Finance*, vol. 82, no. 2: 71-71

Sjøvaag, H., Moe, H., & Stavelin, E. (2012) „Public service news on the Web: A large-scale content analysis of the Norwegian Broadcasting Corporation's online news", *Journalism Studies,* vol. 13, no. 1: 90–106

Tsiligiris, V. & Bowyer, D. (2021) „Exploring the impact of 4IR on skills and personal qualities for future accountants: a proposed conceptual framework for university accounting education", *Accounting Education*, vol. 30, no. 6: 621-649

Varaniūtė, V., Žičkutė, I. & Žandaravičiūtė, A. (2022) „The changing role of management accounting in product development: directions to digitalisation, sustainability, and circularity", *Sustainability*, vol. 14, no. 8: 4740

Villar, A.S. & Khan, N. (2021) „Robotic process automation in banking industry: a case study on Deutsche Bank”, *Journal of Banking and Financial Technology*, vol. 5, no. 1: 71-86

Warren, J.D., Moffitt, K.C. & Byrnes, P. (2015) „How big data will change accounting”, *Accounting Horizons*, vol. 29, no. 2: 397–407

Yap, C., Ryan, S. & Yong, J. (2014) „Challenges facing professional accounting education in a commercialised education sector”, *Accounting Education*, vol. 23, no. 6: 562-581

Zambetti, H., Gomes, C.N. & Dos Santos, M.S. (2021). *Intelligent payment processing platform system and method*. US Patent Application 16/890,681

Zhang, Y., Xiong, F., Xie, Y., Fan, X. & Gu, H. (2020) „The impact of artificial intelligence and blockchain on the accounting profession”, *IEEE Access*, vol.*8*: 110461-110477

Zikopoulos, P., Deeros, D., Lapis, G., Deutsch, T., & Eaton, C. (2011). *Understanding big data: Analytics for enterprise class hadoop and streaming data*. New Yok: McGraw-Hill Osborne Media

The Use of New Emerging Technologies and the Transformation of the Tax Environment Through Digitization

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Abstract: *The Romanian government has started the digitization of fiscal processes to facilitate the payment of local taxes and duties. This change comes in the context of the growing international trend of digitization in the tax field, which can lead to increased tax compliance and reduced tax evasion. Investors are attracted by efficient and transparent tax systems that reduce red tape. Town halls were forced to offer online payment systems to citizens, reducing red tape and costs. Digitization of tax processes has already been successfully implemented in countries such as Estonia, Norway and Denmark. Romania aims to align itself with international trends, improving the experience of citizens in the interaction with the local administration. The proposed system aims to create a portal based on new technology for the payment of fees and taxes. Taxpayers can make payments by electronic means, such as internet banking or bank cards. The integration of blockchain technology and cryptocurrencies can bring benefits such as increased security, transparency and reduced operational costs. Alternative methods of paying fees and taxes are increasingly used globally. In the United States, over 70% of tax payments are made online, and in Canada, over 90% of tax payments are made online or via mobile apps. Some governments are also exploring the use of cryptocurrencies as an alternative method of paying taxes and duties. Implementing an info-kiosk system for accessing and paying local taxes and fees can bring significant benefits in efficiency and citizen satisfaction concomitant with the acceptance of alternative payment methods such as cryptocurrencies or NFTs. In Romania, citizens can pay fees and taxes by physical payment card or internet banking. These methods facilitate the payment process and improve the efficiency of the collection of duties and taxes.*

Keywords: *Fiscal environment, digitization, electronic environment, cryptocurrencies, blockchain.*

1. Introduction

Romanian society is currently in a stage of significant transformation, determined by the At the global level, the communities are currently in a stage of significant transformation, determined by the transition process from a centralized political system to a democratic and decentralized one, by the reconfiguration of the inherited socialist economic structure and by the re-evaluation of some contemporary and pragmatic criteria in the support of the individual and his needs, but also for the development and increase of the competitiveness of the capital. The economic and political crises and significant obstacles in resource flows have amplified the need to modernize the operations between the state and individuals (Aivaz *et al.*, 2022). The change of the

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national system from a planned economy to a market economy, in which free initiative, private property and the mechanism involving the organic cooperation between market laws and government actions play an essential role, highlights a complex and challenging process. Each nation develops its own fiscal strategy by determining the number, categories and amount of taxes and duties borne by taxpayers. They are organized based on various criteria in order to evaluate and analyze the impact of taxation on economic dynamics. Among the most common aspects are the legal and administrative characteristics that classify taxes into direct and indirect.

According to data provided by the Organization for Economic Co-operation and Development (OECD), all direct and indirect taxes exert a different impact on the standard of living of the population. In the case of direct taxes, OECD studies show that they affect approximately 40% of the nominal incomes of different social categories, causing a decrease in them. At the same time, indirect taxes, which constitute around 30% of the total taxes collected, contribute to reducing the purchasing power of the population. In addition, the OECD Taxation Report 2021 indicates that the share of direct and indirect taxes in the total revenue of member states varies significantly. On average, direct taxes represent 34.3% of tax revenues, while indirect taxes represent 32.8%. These data underline how different types of taxes influence the standard of living of citizens and highlight the need for a balanced fiscal policy to ensure the well-being of the population.

In a market economy, such as the Romanian one, in which economic activity generated in 2022 a GDP of 256 billion USD and a gross national income per capita of approximately 12,500 USD, the autonomy of economic agents must be interpreted as a major responsibility for themselves and for society. Economic agents, which represent approximately 99% of all companies and contribute 70% to employment, carry the weight of the Romanian economy on their shoulders and, therefore, must be supported by the system and not hindered by a tax increase characterized by a significant tax burden.

2. Making the payment of fees and taxes by means of electronic means

The Government of Romania has initiated a significant transformation of the traditional process of paying local taxes and fees, adopting new technologies to provide a more convenient way for citizens and more efficient for the administration. This change also has an international impact.

Globally, the digitization of tax processes has become a common trend among governments. The implementation of these modern solutions not only facilitates the payment of taxes and duties for citizens, but also increases the efficiency of revenue collection at the national level. This can lead to an increase in tax compliance and a reduction in tax evasion. In addition, international comparative analysis reveals that the digitization of tax processes can contribute to increasing a country's competitiveness and investment attractiveness. Investors are attracted to transparent and efficient tax systems that facilitate compliance and reduce red tape.

Therefore, the Romanian Government's initiative to modernize the process of paying local taxes and fees through the use of new technologies is a step forward in the direction of improving the experience of citizens and the efficiency of the administration, as well as in strengthening the country's position on the international stage. In the framework of a draft normative act developed by the Executive, all town halls were obliged to offer citizens online payment systems for taxes and fees. Thus, the citizen has the opportunity to choose the method by which he makes the payment of local fees and taxes. This process leads to the reduction of bureaucracy, the significant reduction of costs and the increase of transparency at the level of administrations.

According to a study by PwC and the World Bank Group (2019), countries such as Estonia, Norway and Denmark have successfully adapted to the digitization of tax processes and created efficient systems for paying taxes and fees online. This has resulted in an improved citizen experience and increased tax compliance. Therefore, the adoption of online payment systems for taxes and fees in Romania is an important step in aligning with international trends and improving citizens' experience in interacting with local government. The purpose of the proposed project is to create an efficient system for paying taxes and duties associated with global income tax through a cloud-based portal. Within this system, taxpayers would be able to make payments using electronic means, directly from their current account. These payments could be made through internet banking or with different bank cards such as credit or debit cards. The aim is to facilitate the payment process for taxpayers and improve the efficiency of tax and tax collection.

To implement an electronic tax payment module based on the use of technologies and electronic devices to perform certain activities or processes, such as making online payments on access without a human user, there are three ways available:

a) payment by physical payment card;
b) payment via internet banking;
c) payment through the info kiosk system.

2.1. Blockchain technology in the payment of taxes and the government system

The integration of blockchain technology in this context can bring benefits such as increased security, transparency in the payment process and reduced operational costs for administrations and citizens.

Cryptocurrencies can improve the tax and taxation system in the following ways:

- Transparency and security: Blockchain technology, on which cryptocurrencies are based, offers an increased level of transparency and security. All transactions are recorded in a decentralized and immutable ledger, which means that it is very difficult to falsify or change data. This can lead to reduced tax evasion and fraud.
- Reduction of transaction costs: Cryptocurrencies enable transactions to be carried out at much lower costs compared to traditional payment methods such as bank transfers. This cost reduction can be beneficial for both citizens and the tax administration.
- Fast and efficient payments: Cryptocurrency transactions can be processed quickly, within seconds or minutes, depending on the digital currency used. This can facilitate the payment of duties and taxes in real time, making the process more efficient and eliminating delays.

- Financial accessibility and inclusion: Cryptocurrencies can facilitate access to financial services for people who do not have bank accounts or who live in areas with poor financial infrastructure. Thus, these people can pay their taxes and duties using cryptocurrencies.
- Simplifying international tax processes: Cryptocurrencies can facilitate cross-border payments and eliminate the need to convert currencies for international transactions. This could simplify the process of collecting duties and taxes for individuals and companies operating in multiple countries.
- Automation of tax collection: By using smart contracts based on blockchain technology, the collection of taxes and duties can be automated, thereby reducing the risk of human error and improving the efficiency of the tax system.

While there are obvious advantages to adopting cryptocurrencies in the tax and taxation system, it is important to note that there are also challenges (Jakubowicz, 2022), such as cryptocurrency price volatility, lack of clear regulations, and concerns about money laundering and terrorist financing. However, as technology develops and regulations adapt, cryptocurrencies could bring significant improvements in the management of taxes and duties.

There are a variety of alternative methods of paying taxes and duties, and they are increasingly being used around the world. For example, in the United States, more than 70% of tax payments are made through online payment services, such as websites and mobile apps specialized in tax payments. In 2020, more than 1.6 billion tax payments were made online, according to data from the Internal Revenue Service (IRS). In other countries, such as Canada and the UK, tax payments can be made via bank transfers, mobile apps, online payment services or via credit or debit cards. In the case of Canada, more than 90% of tax payments are made online or via mobile apps, according to government data.

In addition, some governments are beginning to explore the possibility of using cryptocurrencies as an alternative method of paying taxes and duties. For example, in Switzerland, people can pay taxes through a special cryptocurrency platform. In 2020, several US states were reported to have expressed interest in accepting tax payments in cryptocurrencies.

In general, the use of alternative payment methods can improve the efficiency and convenience of tax payments for citizens and reduce the costs and manual work required for governments in the process of collecting taxes and fees.

According to an opportunity analysis, the implementation of such a system can bring significant benefits, such as:

- Reducing the time needed to obtain tax information, thus increasing efficiency and convenience for citizens.
- Reducing the number of people who have to go to the counters of the tax authorities to obtain information or make payments, which reduces congestion and saves time and resources for the administration.
- Increasing the transparency and accessibility of tax information, allowing citizens to easily find out about their tax debts and pay them in a convenient way.

- The potential to generate cost savings both for the tax authorities, by reducing administrative and operational burdens, and for citizens, by avoiding the costs associated with traveling to the offices of the tax authorities.

2.2. Payment of fees through conventional electronic banking methods

There are two ways in which citizens can pay local taxes and fees in Romania. The first method is payment by means of a physical payment card, which is available to all persons holding a payment card issued by any bank. However, there may be some limitations on the types of cards accepted for payment to the Tax and Duties Department and these limitations must be displayed on the information page of the information system. The citizen will present himself at the Directorate of Taxes and Taxes with the card on him and will be able to obtain an electronic power of attorney note that can be printed.

The second method is payment via internet banking, which is addressed to citizens who have current accounts opened at banks that offer internet banking systems with the possibility of making payment orders. After being informed about the amounts owed, the citizen can enter the internet banking system of his bank, using its specific procedures. Here, he can issue a payment order to the State Treasury or other tax collection structure, copying exactly the accounts and payment structure recommended by the electronic power of attorney note.

Internet Banking, also known as Online Banking, Electronic Banking, E-Banking or Virtual Banking, is an electronic payment system that allows users to carry out financial transactions through a platform managed by the banking institution. Today, Internet Banking is an increasingly popular way to make payments and transfers, being available globally. According to a study conducted by Business Insider, in 2021, more than 50% of banking consumers in the United States used Internet Banking as the primary way to manage their bank accounts. This is a significant increase from 2011, when only 36% of consumers used this service.

Internet Banking services allow managing current and deposit accounts, making payments, currency exchange and many other operations at any time, from the comfort of your own home or from anywhere you have an internet connection. These services are available at a lower cost than at bank counters, which makes them an attractive option for many users.

In the era of new emerging technologies, banking transactions are facilitated and secured through online channels, without the need for physical presence at the bank for any desired operation. Thus, users only need a device with internet access to be able to carry out transactions comfortably and safely. Through Internet Banking services, users can manage current and deposit accounts, make payments, exchange currency and much more, at a much lower cost than at traditional bank counters. This method offers the possibility to perform banking operations in lei and in foreign currency, from any computer connected to the Internet, ensuring a high level of transaction security.

Through Internet Banking services, users have access to a wide range of banking operations, including payments in lei and foreign currency, replenishing card accounts, viewing account statements, currency exchange, repayment of credit installments and much more, directly from the computer personal or smartphone. According to a study carried out in 2021 by the CEE Bankwatch Network, the number of Internet Banking users has increased significantly in the last year in Central and Eastern Europe, reaching approximately 50% of the population. In addition, more and more people are choosing to manage their bank accounts online due to the convenience and security offered by these services.

3. The use of new technologies in everyday life and cost savings from the use of online banking services

It is important to note that although cryptocurrencies have gained popularity in recent years, their use as a payment method remains limited. According to a recent report published by the Organization for Economic Co-operation and Development (OECD), the use of cryptocurrencies as a payment method still remains limited. According to the report, in 2021, the total value of transactions made with cryptocurrencies represented less than 1% of the total financial transactions made globally. Although there is a growing number of merchants that accept cryptocurrencies as a form of payment, they are still mainly used for investment and speculation in the financial markets. In addition, there are still issues with the stability and security of these digital currencies, which may discourage users from using them for current transactions. However, the use of cryptocurrencies is expected to continue to grow in the coming years with the development and popularization of blockchain technologies and other digital financial instruments.

However, blockchain technologies and cryptocurrencies are considered to be important in developing payment systems and increasing their efficiency. Some governments and central banks are beginning to explore the use of blockchain and cryptocurrencies in developing their own digital payment systems, such as the European Central Bank's digital currency, which is currently in the works.

Internet Banking is a banking platform based on Internet technology and the issuer's computer systems, which offers customers the opportunity to access banking operations via computer or smartphone, both in the country and abroad. They can be done at any time of the day, without the need to physically go to the bank. In practice, to access these operations, the client does not need special equipment or programs, being able to access any platform through a web browser and an Internet connection.

In general, the use of Internet Banking services is much more advantageous for banks in terms of costs compared to transactions made for services accessible only at the counter, saving time and expenses. According to studies, the proportion of people who have used Internet Banking services has increased considerably in recent years. In this sense, according to a report published in 2021 by the National Institute of Statistics, 55.2% of Romania's adult population used online banking services in 2020, up from 52.6% the previous year. Also, according to the same report, in the period 2018-2020, the number of people who used Internet Banking to make payments increased by 12.8%, and the number of people who used mobile banking applications increased by 24.7 %.

The use of Internet Banking services has become increasingly popular in Romania and other countries, due to its advantages, such as convenience, accessibility and security.

Through Internet Banking, users can make payments and check the status of their bank accounts anytime, anywhere, using their mobile devices or personal computers. These services are very useful for people who have a busy schedule or live in areas far from bank branches, giving them a quick and convenient way to access banking services. In addition, Internet Banking services are protected by advanced security technologies such as multi-factor authentication and data encryption, making online banking transactions more secure than traditional over-the-counter transactions. According to a study carried out by the European Central Bank in 2020, the rate of use of online banking services in Romania increased from 26% in 2017 to 48% in 2020, currently being above the European average of 43%.

Also, a study conducted by the market research company Ipsos in 2020 shows that, globally, 7 out of 10 consumers use online banking services, and the rate of their use has increased significantly in recent years.

As for cryptocurrencies, they are constantly being developed and used worldwide, but the degree of adoption varies greatly from country to country. According to a study by Cambridge University in 2021, the number of cryptocurrency users in the world increased from 35 million in 2018 to 101 million in 2021. At the same time, the study shows that the United States of America and Western Europe are the largest markets of cryptocurrency users, while in other parts of the world, such as East Asia and Africa, adoption is still low.

4. Use of remote banking services

According to data published by the National Bank of Romania, the use of Internet Banking services has increased significantly in recent years. Thus, in 2020, the number of transactions made through Internet Banking services was 355.1 million, an increase of 11.9% compared to the previous year. Also, the value of transactions made through Internet Banking was 963.8 billion lei, up 25.4% compared to the previous year. These figures reflect the increase in the use of Internet Banking services in Romania and the trend towards digitization of banking services.

4.1. Internet Banking Service

As for the electronic payment instruments of Internet Banking, they include the web-based Internet Banking service, which is addressed to clients of natural and legal persons who have at least one current account at one of the banking units. This service offers the possibility of comfortable and safe banking operations in lei and foreign currency from any computer connected to the Internet.

In Romania and the European Union, the payment instruments used to pay taxes vary depending on the country and the institution that collects the taxes. In general, the payment of fees can be made through the following payment instruments:

- Bank transfer - is the most frequently used payment instrument in Romania and the European Union, and allows the transfer of funds between bank accounts.
- Payment by bank card - is a popular option in recent years and has become increasingly common in Romania and the European Union. Payment by bank card can be made at tax counters or online.

- Payment through online payment services - online payment services such as PayPal, PayU, Skrill, etc. means of payment are increasingly used in the European Union.
- Payment through mobile applications - payments through mobile applications used by individuals and companies are becoming more and more common in Europe, especially among young people.
- Payment via cryptocurrencies - this payment method is still in development in the European Union, but a few countries, such as Switzerland, already allow payment of taxes with cryptocurrencies.

In general, governments and tax authorities encourage the use of electronic payment instruments because they are more efficient and cheaper than traditional payment instruments such as cash. The use of these tools can also reduce tax evasion, as electronic payments are easier to track and verify than cash payments.

4.2. Using the Home Banking service

According to data published by the National Bank of Romania, the number of transactions made through Home Banking services has increased significantly in recent years. Thus, in 2020, the number of transactions carried out through Home Banking services was 145.2 million, an increase of 21.6% compared to the previous year. Also, the value of transactions carried out through Home Banking services was 123.9 billion lei, up 24.2% compared to the previous year. These figures reflect the increase in the use of Home Banking services in Romania and the trend towards digitization of banking services.

Home Banking is a popular form of online banking that offers customers the ability to perform banking transactions from their own computer via a modem. Currently, most banks in Romania offer Home Banking systems, which allow customers to perform various banking operations, such as obtaining account statements, paying invoices and transferring funds between accounts.

To use the Home Banking services, the bank offers customers a financial software that allows financial transactions to be carried out through their own home computer. The bank can install the electronic payment system free of charge at the client's premises, thus allowing the administration and operation directly in the accounts opened at the bank. Using Home Banking services provides customers with a convenient and efficient way to manage their personal finances, giving them access to their bank accounts from anywhere and at any time.

Home-Banking is an online banking system that allows customers to manage their bank accounts remotely via a computer and an Internet connection. It allows you to perform banking operations, such as checking your balance, transferring funds, paying bills or paying taxes, without having to travel to a bank branch.

Through Home-Banking services, users can access their bank accounts and perform various banking operations conveniently and efficiently, from anywhere and at any time, without being limited by bank opening hours or geographical location. Home-Banking is increasingly popular nowadays because it offers a convenient solution for managing personal finances with a high level of security and privacy.

Benefits:

- Program installation, customer training and technical support are generally free;
- Security and confidentiality of transactions are guaranteed;
- Control of access and operating failures of users in the company and/or facilitating the decision on operating failures of users, including limits of amounts per day or per operation. According to the data published by the National Bank of Romania, the use of Mobile Banking services has increased significantly in recent years, reflecting the trend towards digitization of banking services. Thus, the number of transactions made through Mobile Banking services in 2020 was over 27 million, up 42% compared to the previous year. Also, the value of transactions made through Mobile Banking services was over 42 billion lei, up 52% compared to the previous year.

In the context of the increase in the use of internet banking and mobile banking services, banks must pay special attention to the protection of customers' personal data and the security of financial transactions. In this regard, banks must implement appropriate cyber security measures, such as multi-factor authentication or monitoring of suspicious activity.

According to a report by the National Bank of Romania, published in 2020, the increase in the use of internet banking and mobile banking services in recent years has led to an increase in the number of frauds and cyber-attacks on financial institutions. Thus, it is important that banks take appropriate measures to protect customers' personal data and invest in the development and implementation of cyber security solutions to ensure a safe and reliable environment for the use of their electronic services.

Banks face significant operational risks in the context of rapid developments in information technology. One of these risks is the potential loss caused by significant deficiencies in the integrity and viability of electronic money or electronic banking systems. Security considerations are a key priority as banks may be subject to external or internal attacks on their products and systems.

5. Risks associated with developing, implementing and maintaining systems

Therefore, the bank may be exposed to the risk of interruption or slowdown of its systems if the electronic banking services or electronic money offered by the bank are not compatible with the user's requirements.

5.1. The risks associated with the inappropriate use of banking products and services by customers.

With the increase in the use of electronic banking services, the risks related to their improper use by customers have become more apparent. According to a report by the Ponemon Institute, in 2020 the average cost of a security breach to the financial sector was $5.9 million. Additionally, according to research by NortonLifeLock, 54% of consumers are concerned about the security of their online bank accounts, while 78% of consumers agree that using a two-factor authentication device could help prevent fraud.

Reputational risk refers to the significant loss of public confidence in a bank as a result of negative public opinion. Reputational risk is associated with the loss of confidence of customers or the general public in the bank's activity, as a result of its inappropriate actions or decisions, which can seriously affect the image and credibility of the bank. This risk can be triggered by major incidents, such as corruption scandals or violations of the law or ethical norms, but also by smaller issues, such as poor service or poor communication with customers.

Legal risk can also arise in the event of infringement of copyright, patent and other intellectual property. Also, banks that use “e-banking” or “e-money” type products may be subject to legal actions for violating the rules and regulations regarding the protection of personal data, information confidentiality and data security. In addition, legal risk may arise if banks do not comply with legal requirements and regulations regarding the prevention of money laundering and terrorist financing.

In Romania, there are currently several e-money platforms, such as Revolut, TransferWise, Payoneer or Skrill, which allow users to pay taxes through them. In the European Union, there are a number of rules and directives governing the use of e-money in financial transactions, such as the Payment Services Directive (PSD2). They ensure the safety and security of transactions and protect consumers against fraud or other risks associated with the use of electronic money.

In addition, banks that offer e-banking services face the risk of fee collection, which is often higher than for traditional banks because there is less face-to-face interaction with customers. According to research by the United States Electronic Banking Association, by 2022, the cost of collecting fees for electronic banking services is expected to reach US$6.2 billion.

3. Conclusions

Approximately one third of the receipts from fees and taxes in Romania is made online. Romanian citizens increasingly turn to this modern method of paying tax obligations. According to a 2019 study, about 10% of card payments nationwide for local taxes and fees were made at District 1 City Hall.

In the current context, it is important to pay particular attention to balanced territorial development and to promote solidarity between local communities, especially regarding their expectations and needs. Indeed, uneven development between rich and poor communities can lead to unhealthy economic growth and widening existing gaps. Therefore, an integrated and calculated approach to territorial development is needed, which ensures balance and sustainability as a whole.

In recent years, paying taxes online has become increasingly popular worldwide. This is due to the increasing adoption of technology and the implementation of digital payment systems in many countries. According to the World Bank's “Doing Business 2020” report, countries continued to improve their tax administration systems and facilitate the payment of taxes through online platforms. However, there is no exact global figure for the percentage of taxes paid online, as it varies by country and type of tax.

It is important to note that the situation is constantly changing and the adoption of online tax payments continues to grow as countries develop their digital infrastructures and promote the use of electronic payment systems.

In order to reduce bureaucracy, local administrations offer taxpayers a variety of modern payment methods: electronic payment through internet banking, card payment and online payment through the Ghiseul.ro platform.

In different countries, there are various online tax payment systems. They vary by country and by available digital infrastructure. Here are some examples:

- United States: The IRS (Internal Revenue Service) offers online payment options for federal taxes through Direct Pay and EFTPS (Electronic Federal Tax Payment System).
- UK: HMRC (Her Majesty's Revenue and Customs) allows tax to be paid online through their direct payment services, which include Direct Debit, Faster Payments, CHAPS (Clearing House Automated Payment System) and Bacs (Bankers Automated Clearing Services).
- Canada: The Canada Revenue Agency offers online payment services through the My Payment service, as well as through partner financial institutions.
- Australia: ATO (Australian Taxation Office) allows online tax payments via MyGov, BPAY and direct banking.
- Germany: Tax services in Germany offer the possibility to pay taxes online via FinanzOnline and ELSTER (Elektronische Steuererklärung).

This is not an exhaustive list, as most countries have implemented or are working on implementing online payment systems for their taxes. It is important to note that these systems may vary by jurisdiction and the types of fees collected.

Local budgets are essential tools for forecasting, planning and managing the financial activity of administrative-territorial units. Their structure reflects the degree of autonomy of the local administration in relation to the central one, as well as the financial flows of the local administration, including the revenues and public expenditures at the territorial level, the way of financing the expenses by destination and the way of covering the deficits.

The local budget is an essential tool for the development of administrative-territorial units in Romania. According to official data, in 2021, local budgets were estimated at a total value of 55.3 billion lei, an increase of approximately 5.5% compared to the previous year. Revenues to the local budget are generated from several sources, such as local taxes and fees, subsidies, transfers from the state budget and other revenues.

The distribution of local public expenses is made according to the priorities established by the local public administration authorities, for the purpose of the operation and development of the respective communities. These expenses can be earmarked for investments in infrastructure, education, health, culture, sports and other important areas.

The role of the central public administration in the field of local public finances is to initiate and promote relevant normative acts and to establish the methodology for the elaboration and execution of local budgets. The Ministry of Finance has an important role in monitoring and managing local public finances, to ensure the efficient use of resources and the prevention of abuse or fraud in this area.

The responsibility of local administrations, including in the context of the European Union and other states, is to draw up a balanced operating budget, in which expenses should not be underestimated, and revenues should not be overestimated. This must be done, taking into account the territorial autonomy and the budgetary policy promoted by the legislature and the executive, according to the rules and recommendations applicable at the European Union and international level.

In Romania, the revenues of local public administrations come from sources such as local taxes and fees, fees for the issuance of documents and authorizations, the broken-down quotas from the tax on the income of natural and legal persons, the broken-down quotas from the tax on the incomes of micro-enterprises, but also from the amounts allocated through transfers from the state budget. According to the data of the Ministry of Public Finance, in 2021, the total revenues of the local budgets were estimated at approximately 81 billion lei, and the total expenses at approximately 92 billion lei. In addition, in the case of European Union member countries, there is also the possibility of accessing structural and investment funds for local development. The revenue of local public administrations in Europe varies significantly between countries and regions, and the main source of revenue may be different. For example, in France, local property tax is an important source of revenue for local governments, while in the Netherlands, earmarked transfers from the central government account for the majority of local government revenue.

In general, in the European Union, local governments' own revenues, such as local taxes and fees, account for about 30% of their total revenue, while earmarked transfers from central government account for about 70%. However, there are significant differences between EU countries, depending on each country's financial structure and tax policies.

The use of modern technologies and innovative payment methods, including cryptocurrencies, has significantly improved the collection of taxes and duties around the world. According to a study by the World Bank in 2020, digitization of tax administration increased tax revenue collection in developing countries by about 2% of GDP over a 10-year period. This increase is due to the efficiency of collection processes and the reduction of tax evasion through digital payment systems.

In developed countries such as those in the European Union, the adoption of digital payment systems has led to increased tax compliance and more efficient tax collection. For example, in Denmark, tax compliance increased by around 3% between 2015 and 2020 due to the implementation of modern digital payment systems.

As for cryptocurrencies, they are beginning to be accepted as payment for taxes and duties in some jurisdictions. For example, in the US state of Ohio, taxpayers have been able to pay taxes in Bitcoin since 2018, facilitating collection and facilitating access to new payment methods for taxpayers. However, the use of cryptocurrencies to pay taxes and duties is still limited in most countries, and the impact on tax collection remains to be seen in the long term.

Considering the impact that the volume and quality of public expenditures have on the consumer of local public services, it is important that local public authorities establish objectives, directions of action, priorities and opportunities as efficiently as possible.

According to Eurostat data, in 2020, total public expenditure represented on average 45.6% of the GDP of the countries in the European Union. Of these, public service expenditures represented approximately 10.4% of GDP, with significant differences between member countries.

At the same time, the use of new technologies and modern payment methods, as well as cryptocurrencies, can help to collect taxes and fees more efficiently, which can lead to an increase in the revenues of public authorities and implicitly to the improvement of the quality of public services offered to citizens. According to a report by research firm MarketsandMarkets, the global cryptocurrency payment market could grow from $1.6 billion in 2021 to $6.7 billion by 2026, indicating increased interest in this form of payment.

In order to establish the priorities and directions of action of the local public administrations in the process of substantiating the budgets, certain criteria are followed to help satisfy the real needs of the citizens, leading to the consolidation of the local public administration. Statistical data show that in Romania there are precarious conditions in which local authorities operate, which makes the balancing of local budgets a current topic and the subject of numerous debates. There is a gap between the communities that achieve sufficient own income and those that cannot manage even for the maintenance expenses of the locality.

In general, the imbalance of local budgets can be caused by several factors, including:

- Lack of sufficient financial resources
- Inefficient use of available resources
- Increased costs of public services
- Increase in local public debt
- The inadequacy of the fiscal system
- Erosion of the tax base
- Corruption and inefficiency in public administration

To address these issues, fiscal and governance reforms are needed, including improving revenue collection, strengthening local financial planning and management capacity, and promoting a culture of financial responsibility in public administration.

Currently, there is a dispute between the representatives of the first and those of the last extreme solutions, regarding the elimination of the procedure for balancing local budgets. This problem is found on two levels of government: from the central level to the county level and from the county level to the local level.

Local communities that manage to achieve better economic (Munteanu, 2018), social and demographic performance tend to break away from those that face insufficient income. This is because a strong local economy can create business opportunities and jobs, attracting new resources and investors. On the other hand, communities experiencing economic hardship may have difficulty attracting investment and may have more limited resources to support their infrastructure and public services. Within the European Union, there are special programs and funds that are intended to support balanced regional development and combat economic and social gaps between different regions. In today's Europe, economic and social development is based on economic and social cohesion. This concept suggests that there is uneven development between regions, communities or states, which can lead to significant economic, social and demographic disparities of the territories that reflect the economic weaknesses of the whole assemblage and which are unacceptable because they become a source of political and economic instability.

In 2020, there were 1,596 town halls in Romania reporting a budget deficit, out of a total according to official data provided by the Romanian National Institute of Statistics, on January 1, 2021, there were 2,861 administrative-territorial units in Romania, which include communes, cities and municipalities, as well as sectors in Bucharest. Within them, there are a number of 3,186 town halls (of which 6 in the sectors of Bucharest). These figures may have changed over time, but this is the latest official data available.

The use of cryptocurrencies by municipalities can bring a number of benefits in terms of the efficiency of spending and the administration of local budgets. Here are some efficiency measures that could be applied through cryptocurrencies:

- Faster and cheaper payments: Using cryptocurrencies can reduce the costs and times required to make payments. Cryptocurrency payments can be processed in minutes and with very little or no fees, compared to traditional payments that can take days or weeks and are subject to higher fees.
- Eliminating intermediaries: Cryptocurrencies can eliminate the need for intermediaries such as banks or other financial institutions. This can reduce costs and speed up the payment process.
- Financial transparency: The use of cryptocurrencies can bring financial transparency, as all transactions made with them are publicly and immutably recorded in the blockchain. This transparency can reduce the risk of fraud and corruption.
- Reducing tax evasion: Cryptocurrencies can be used to more easily track payments and transactions and identify potential tax evaders.
- Stimulating the local economy: Municipalities could issue their own local cryptocurrencies to stimulate the local economy and encourage people to buy and invest in the local community.
- Implementation of innovative projects: By using cryptocurrencies, municipalities could implement innovative projects in areas such as renewable energy, electric transport or waste management.

In conclusion, the use of cryptocurrencies can bring many benefits for the efficiency of spending and the administration of local budgets. However, it is important that municipalities ensure that they use cryptocurrencies responsibly and consider the risks associated with them.

By adopting and using new technologies in the fiscal activity, the collection of taxes and fees can be improved and, implicitly, increase the budget revenues. According to a 2021 European Commission report, the use of electronic invoices can reduce administrative costs by up to 80%, and they can be issued and processed in real time, thus reducing the risk of tax evasion. Online payment of taxes and fees can also increase the efficiency of collection by providing taxpayers with an easier and more convenient way to pay their tax obligations. According to a study by Visa, the number of card payments in Europe increased by 7% in 2020, and 37% of consumers said they prefer to pay by card or other digital payment methods. These technologies can also help reduce corruption and tax evasion, which can lead to greater trust in tax administration and increased fiscal revenue collection.

References

Poanta, D. (2018), *Instrumente de plată. Sisteme de plăți*. Editura Universitară, București.

Aivaz K.A, Munteanu I.F., Stan M.I., & Chiriac A.A (2022), Multivariate Analysis of the Links between Transport Noncompliance and Financial Uncertainty in Times of COVID-19 Pandemics and War. *Sustainability,* vol. 14, no. 16: 10040. https://doi.org/10.3390/su141610040.

Devereux, M.P. & Vella, J. (2018). Debate: implications of digitalization for international corporate tax reform. *Intertax,* vol. 46, no. 6/7: 550-559

Jakubowicz, F.V. & Munteanu, I. (2022). Perspectives on Tax Optimization: Opportunities and Challenges. *Ovidius University Annals, Economic Sciences Series*, vol. 22, no. 2, 883-889

Munteanu, I. (2018), *The challenges of performance assessment in Romanian state-owned enterprises. In Strategica* 2018. Challenging the Status Quo in Management and Economics; Bucharest: Tritonic Publishing House, pp. 1247-1257, available on-line at https://strategica-conference.ro/wp-content/uploads/2022/05/106.pdf

Rădulescu, M. & Șerbănescu, L. (2019), *Development of the Electronic Banking Services in Romania*. available on-line at https://www.researchgate.net/publication/50996670_Development_of_the_electronic_banking_services_in_Romania

Trenca, I. (2018), *Metode și tehnici bancare, ediția a 4-a*. Cluj-Napoca: Casa Cărții de Știință.

Țâtu, L. (coord.) (2017). "*Fiscalitate și control fiscal*". Bucureşti: Aner.

OCDE (2021) "*Revenue Statistics 2021*", available on-line at https://www.oecd-ilibrary.org/taxation/revenue-statistics_2522770x

PwC and World Bank Group (2020) *Paying Taxes 2020*, available on-line at https://www.pwc.com/gx/en/services/tax/publications/paying-taxes-2020.html

SECTION 12 Financial reporting 3

Constructive Obligations as Credible Promises. A Reputational Approach

Stere Mihai

Constructive Obligations as Credible Promises. A Reputational Approach

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Abstract: *The paper makes the simple observation that IASB's definition of constructive obligations parallels the game theoretic notion of credible promises. However, in the absence of any enforceable contracts and explicit laws, it is not clear how these promises acquire credibility. We first study a simple game of trade between a seller and buyer. In the unique equilibrium of this game trade never happens because buyer's promises to settle the trade are not credible. We then show how the repetition of the game coupled with a concern for reputation can induce credibility to promises.*

Keywords: *Constructive obligations, obligating event, credible promises, equilibrium, repeated games.*

1. Introduction and motivation

IASB defines a constructive obligation as: "an obligation that derives from an enterprise's actions where:

(a) by an established pattern of past practice, published policies or a sufficiently specific current statement, the enterprise has indicated to other parties that it will accept certain responsibilities;

and

(b) as a result, the enterprise has created a valid expectation of the part of those other parties that it will discharge those responsibilities" (IAS 37 par. 10, non-italic added).

Closer inspection of this definition reveals a parallel between the notion of constructive obligations and the game theoretic concept of a credible promise. The indication that the enterprise will accept some responsibilities corresponds to the promise, while the valid expectation of the other parties that the enterprise will discharge the responsibilities corresponds to the credibility of the promises.

The analogy between constructive obligations and credible promises is further supported by the definition of an obligating event as: "an event that creates a legal or constructive obligation that results in an enterprise having no realistic alternative to settling that obligation" (IAS 37 par. 10). In game theoretic terms, an event is an obligating event if the company's best response to it is to settle the obligation.

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However, it is not clear how these promises acquire the credibility that turns them into obligations. Motivated by the analogy described above, we use some game theoretic results to explain how promises become credible. We first study a simple game of trade and show that, absent any contracts and laws, trade on credit never happens in equilibrium because the buyers' promises are not credible. We then study the same game repeated multiple times with the same buyer but different sellers. We use a theorem in the theory of repeated games to show how the buyer's concern for reputation induces credibility of its promises.

We prefer to frame the stage game in terms of buyers and sellers even though trade activities are usually regulated and create legal rather than constructive obligations. We do this for two reasons. First, as we claim later on, the underlying story of the game is irrelevant for the analysis of the game. What matters is the structure of the payoffs. Therefore, we prefer the buyer and seller formulation because it is more intuitive and easier to understand. Second, and more important, the trade game is studied in the absence of contracts and laws and, in this way, the paper explains how trade obligations can arise as constructive rather than legal obligations.

2. The base game and variations

We consider the following dynamic game (call it base game or game 1) between a seller (S) and a buyer (B). In period 0 the seller decides whether or not to sell a good to the buyer. In case the sale takes place, the buyer is supposed to settle the exchange in period 1. We assume the exchange price is p, the production cost to the seller is c and that buyer's valuation of the product is v. If the seller does not sell the product, it will consume it so the product is not lost. For trade to happen, we assume that $c<p<v$. All this is assumed to be common knowledge. Unlike the bargaining literature, which is concerned with price formation (e.g., Lipman (1990)), we take the price p as given and even allow the buyer to take some of the gains from trade ($p<v$). In addition, our buyer is financially sound. This excludes the possibility of natural default and allows us to focus solely on incentives to default strategically. The extensive form of the game is given in Figure 1.

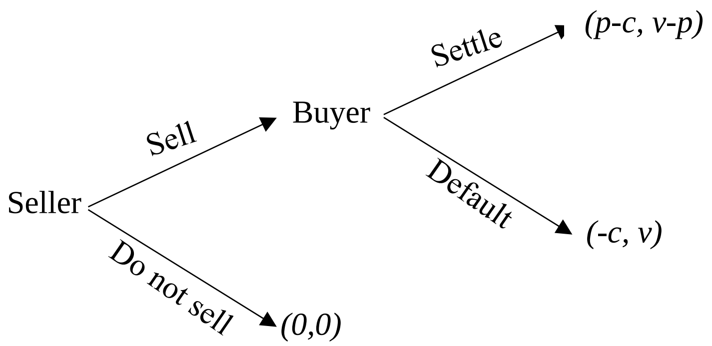

Figure.1 **Extensive form of game 1**

We solve this game by backwards induction. In period 1, when the buyer moves, the buyer finds it optimal to default strategically (because $v > v-p$). However, a rational seller can anticipate the buyer's move and knows that, when given the chance to move, the buyer will default. This leaves the seller with the negative payoff -c. Consequently, in period 0 when the seller moves, the seller finds it optimal not to trade at all and get a payoff of 0 > -c.

The strategic form (the payoff matrix) is given in Table 1.

Table 1. **Normal form of game 1**

Seller \ Buyer	Settle	Default
Sell	p-c, v-p	-c, v
Do not sell	0,0	0,0

The only Nash equilibrium of this game is (Do not sell, Default) which is exactly the solution indicated by backwards induction. Therefore, the unique prediction for this game is that no trade happens in equilibrium. We've just proved:

Remark 1. The backwards induction solution and the Nash equilibrium of the base game make the unique prediction: (Do not sell, Default).

A few remarks are in order about this game. The Nash equilibrium (Do not sell, Default) is inefficient. The outcomes (Sell, Settle) and (Sell, Default) are both socially desirable to the equilibrium outcome (Do not sale, Default). This is because the aggregated wealth in the former two outcomes is (v-c) and is 0 in the latter. However, the allocation of the wealth among players is different between the two socially desirable outcomes. In (Sell, Settle) the surplus is shared between the players whereas in (Sell, Default) the buyer gets all the surplus. The buyer prefers the seller to Sell since, when that happens, the buyer is guaranteed a non-negative and non-zero payoff. A sale, however, never happens in equilibrium because once the sale is made the buyer has no incentive to settle. Simply put, the buyer has no rational incentive that will obligate it to make the payment and, most importantly, the seller anticipates this. Thus, in this base game, default is costless and, absent any incentives to deter default, the sale/purchase is not an obligating event since the buyer has Default as a realistic alternative.

An aside: Irrelevance of the underlying story and the structure of the game

The details of the game above may be cast under a different formulation, allegedly closer to the idea of constructive obligations. In this formulation (call it game2), player 1 is a municipality which must decide whether to grant or not to grant the exploitation rights of some nearby site to a firm, player 2. If the rights are granted, then in the second stage the firm decides whether, at some cost, it restores or does not restore the site. Assuming the municipality derives benefit b from granting the exploitation rights and the restoration cost is c, the extensive and strategic forms of the game are given in Figure 2.

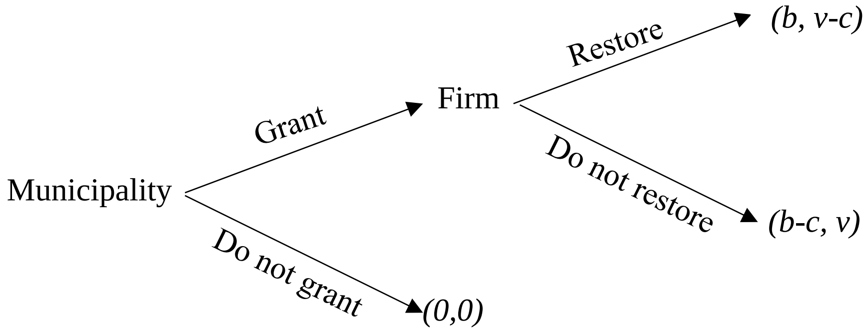

Figure 2. **Extensive form of game 2**

Table 2. **Normal form of game 2**

Firm / Municipality	Restore	Do not restore
Grant	*b, v-c*	*b-c, v*
Do not grant	*0,0*	*0,0*

An analysis similar to the one above allows us to formulate the following remark:

Remark 2. If c > b, the backwards induction and Nash equilibrium of this game predict a unique outcome (Do not grant, Do not restore).

Remark 2 implies that, for certain configurations of the payoffs, the alternative formulation of the game (game 2) is similar to the initial one (game 1). That is, the seller-buyer game and the municipality-firm game are essentially the same game. From a game theoretic perspective, the game is defined not by the underlying story but rather by the incentives it induces. These, in turn, are defined by the relative ordering of the payoffs. The defining feature of the games above is that the socially desirable outcomes (Sell, Settle) (Grant, Restore), never arise as equilibria because they rely on a non-credible promise. The lack of credibility arises from the asymmetry between the ex-post and ex-ante incentives of the buyer (Kreps, 1990). Ex-ante, the buyer has incentives to promise it will settle the transaction but ex-post (after the trade takes place) the incentives to fulfil that promise evaporate. Absent any form of incentive to prevent default, ex-post, defaulting becomes the realistic alternative for the buyer and the purchase is not an obligating event.

Obviously, the equilibrium outcome (Do not sale, Default) is at odds with the empirical observation that trade on credit is actually common practice in economies. One way to deter the buyer from defaulting is to structure the trade via a contract which specifies a large enough penalty for default, thus making it costly for the buyer to default. Assuming a defaulting buyer is caught with probability π and forced to pay the seller a penalty f, let us consider a slightly modified version of the base game with extensive and strategic forms as in Figure 3 and Table 3 respectively. In Table 3 we have replaced the payoffs in cell (Sell, Default) with the respective expectations. As is shown in remark 3, if the legal environment is strong enough (i.e. $\pi f > p$) then this assumption is sufficient to make (Sell, Settle) an equilibrium.

Remark 3 If $\pi f > p$ then backwards induction and Nash equilibrium of the modified base game make the unique prediction (Sell, Settle).

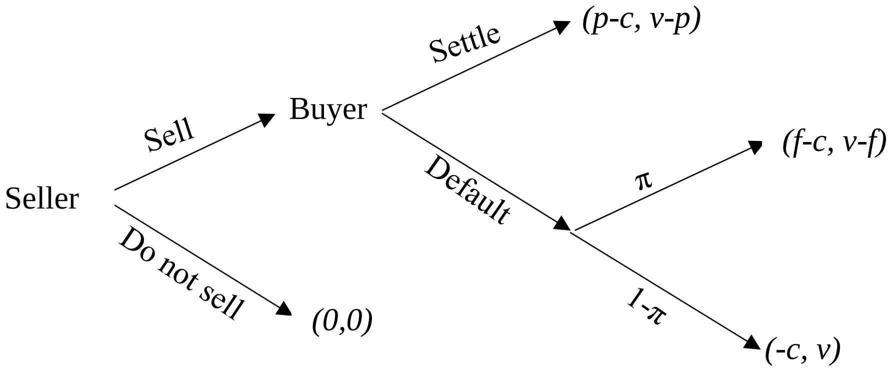

Figure 3. **Extensive form of modified game 1**

Table 3. **Normal form of modified game 1**

Seller \ Buyer	Settle	Default
Sell	p-c, v-p	πf-c, v- πf
Do not sell	0,0	0,0

However, the subject of our paper is constructive obligations which, by definition, exclude any incentives created via contracts and laws. In other words, while we want the socially desirable outcome (Sell, Settle) to be part of an equilibrium, we constrain this equilibrium to be independent of the existence of contracts and laws. Some other form of penalty for defaulting must arise endogenously and must be imposed implicitly by the sellers with whom the buyer interacts.

In the following section we use a theorem from the theory of repeated games to show how repetition of the interaction coupled with the buyer's concern for reputation can restore the credibility of a promise to settle the trade. We follow Kreps (1990) and Gibbons (1992) in the exposition.

3. The repeated game

Suppose now that buyer B faces an infinite sequence of sellers S_n, one in every period t_n. When the players are interpreted as individuals the assumption of infinite repetition is problematic. However, the assumption is theoretically plausible when we interpret the players as enterprises. Indeed, many enterprises are set up with an indefinite prospective life-span. The buyer is assumed to be impatient and has a discount factor of $\delta<1$. The buyer starts with a good reputation which is maintained as long as it does not default. Whenever it defaults, the buyer switches to bad reputation which it keeps forever. The reputation of B is publicly known to all sellers at all times.

The strategies of the sellers remain the same as in the base game but buyer's strategies are now sequences of actions $(b_i)_{i=1}^{\infty}$ where $b_i \epsilon \{Settle, |Default\}$. Likewise, the payoffs of individual sellers S_n remain like in the base game, but the buyer's payoff becomes a (possibly infinite) sequence of payoffs from the repeated interaction with each of the sellers. This sequence is denoted $\left(u_b^i\right)_{i=1}^{\infty}$ Allowing for the impatience of the buyer, the utility of the buyer from the infinitely repeated game, denoted U_b, and is given by:

$$U_b = \sum_{i=1}^{\infty} u_b^i \delta^{i-1}$$

This game has several equilibria but a prominent equilibrium (Kreps 1990, Gibbons 1992) consists of the following proposed strategies: B's strategy is to Settle whenever B has good reputation and sellers offer to trade. Otherwise, B plays Default. S_n's strategy is to Sell if the buyer is in good reputation at time t_n and Do not sell otherwise.

Proposition 4 The pair of strategies proposed above is a Nash equilibrium of the infinitely repeated trade game if and only if $\delta > p/v$.

Proof: Pick an arbitrary stage n in the game. Let us take the buyer's proposed strategy as given. If, at this stage, B is in good reputation then B's proposed strategy requires it to Settle. And S_n's best response to Settle is to Sell which is exactly the proposed strategy for S_n. Therefore "Sell if the buyer is in good reputation" is a best response to B's strategy. On the other hand, if B has already acquired a bad reputation, then B's proposed strategy requires it to Default if a seller ever proposes to trade. S_n's best response to Default is Do not sell which is exactly the proposed strategy of S_n for a buyer with a bad reputation. In conclusion, S_n's proposed strategy is a best response to B's proposed strategy.

Let us now take S_n's proposed strategy as given and analyze if B's proposed strategy is a best response. If B has a bad reputation, then S_n's proposed strategy is Do not sell, to which B's proposed strategy is trivially a best response since when S_n plays Do not sell, B doesn't even get to move. So, in this case, B's proposed strategy is a best response to the S_n's proposed strategy. On the other hand, if B is in good reputation, then S_n's proposed strategy is Sell. If B plays its proposed strategy, then its payoff will be U_b. On the contrary, if B deviates and defaults then its payoff will be v. Therefore, B's proposed strategy is a best response to S_n's proposed strategy if and only if B's payoff from a deviation at time t_n (which is v) is lower than the payoff from following the proposed strategy. In other words, the pair of proposed strategies forms a Nash equilibrium if and only if

$$\sum_{i=1}^{\infty} u_b^i \delta^{i-1} > v$$

For simplicity of the calculation, we make the further assumption that every period the u_b^i equals the payoff of the buyer in the stage game corresponding to the pair (Sell, Settle), that is $u_b^i = v - p$. Factoring v-p in the left-hand side we get

$$(v - p) \sum_{i=1}^{\infty} \delta^{i-1} > v$$

Then passing to the limit we obtain

$$(v - p) \frac{1}{1 - \delta} > v$$

Simple algebra then shows that the pair of proposed strategies is a Nash equilibrium of the infinitely repeated game if and only if

$$\delta > p/v \, .$$

Proposition 4 says that (1) if the interaction is repeated infinitely many times and (2) the buyer is sufficiently impatient (its discount factor is bounded below, $\delta > p/v$) then the socially desirable outcome (Sell, Settle) can arise as equilibrium. This means that a promise to Settle which, in the one shot-game is never credible, acquires credibility. This can happen because in the repeated game, every time the stage game is played the short-term gain from Default, v, is outweighed by the discounted value from playing Settle in the long-run. However, let us remark that the credibility of the promise is achieved only under some restrictions on the discount factor.

The reputational approach described above has several problems. On one hand, the assumption of infinite repetition is certainly very strong. Gibbons (1992) gives a nice interpretation of infinite repetition by interpreting the discount factor as the probability that the game will stop. Thus, in his interpretation, infinite repetition is only probable. As Kreps and Wilson (1982) point out, replacing infinite repetition with finite repetition does not allow the desired outcome to arise as a Nash equilibrium. While their stage game is different than ours, their reasoning works in our case too. Using backwards induction, in the last repetition of the stage game (say at time t_n) the seller knows the buyer has no long-run incentives to settles and it will default. Therefore, the best reply by the seller is Do not sell. The same calculation can be performed in cascade by all the sellers at all previous times resulting in the same best response: Do not sell. Therefore, with finite repetition, the outcome (Sell, Settle) never arises as Nash equilibrium (i.e., the promise to Settle is never credible in finite repetition). Kreps and Wilson (1982) manage to go around this problem by allowing players to have some small uncertainty about the payoffs of the opponent. We do not follow this approach here.

4. Conclusions and relation to prior literature

The conclusions of our paper are straightforward. When constructive obligations are defined in terms of credible promises like IASB appears to have done, the criteria outlined in IAS 37 are problematic. Absent contracts and laws, "published policies" and "sufficiently specific current statements" that the enterprise will discharge accepted responsibilities are not credible in one-shot interactions. When combined with the criterion of "established pattern of past practice", such promises become credible and can be part of Nash equilibria. But, as proposition 4 shows, this happens only under some restrictions on the enterprise's discount factor. If we interpret the discount factor as a proxy for the long-run incentives, then proposition 4 proves that the reporting problem of constructive obligations (whether there exists a constructive obligation) depends on the equilibrium analysis of such incentives.

Our paper draws on the vast literature of repeated games in game theory. Since our purpose was only an application of repeated games to an accounting problem, we drew on expository material in the literature (e.g., Kreps 1990, Gibbons 1992, Mailath and Samuleson 2006). With respect to prior accounting literature, our paper is closest to Demski (2004) and Christensen and Demski (2007) on endogenous expectations and anticipatory reporting standards. These papers do not focus on the problem of obligations. But their conclusion is that reporting standards must allow for the "finer details" and "underlying choices" that led to the reporting problem in the first place. That is, reporting standards must rely on equilibrium expectations or endogenous expectations (Demski, 2004). We reached the similar conclusion that the reporting problem of constructive obligations requires an understanding of the long-run incentives that led the company to undertake the obligating event in the first place.

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References

Christensen, J. & Demski, J.S. (2007) “Anticipatory Reporting Standards”, *Accounting Horizons*, vol. 21, no. 4: 351-370

Demski, J.S. (2004) “Endogenous expectations”, *The Accounting Review*, vol. 79, no. 2: 519-539

Gibbons, R. (1992) *A primer in game theory*, Pearson Academic

Kreps, D.M. (1990) *Game Theory and Economic Modeling*, Oxford: Clarendon Press

Kreps, D.M. & Wilson, R. (1982) “Reputation and imperfect information”, *Journal of Economic Theory*, vol. 27, no. 2: 253-279

Lipman, B. (1990) “On the strategic advantage of a lack of common knowledge”, *Theoretical Aspects of Reasoning about Knowledge: Proceedings of the Third Conference*, Kaufmann Publishers

Mailath, G.J. & Samuelson, L. (2006) *Repeated Games and Reputations. Long-run relationships*, Oxford: Oxford University Press

SECTION 13 Sustainability 4

The Link Between Country Competitiveness, Corporate ESG Performance, and the UN Sustainable Development Goals

Oana-Marina Radu

Voicu D. Dragomir

Liliana Ionescu-Feleagă

ESG Research Within the Realm of Sustainability: A Bibliometric Analysis Using Web of Science Database

Iuliana-Mădălina Petrică (Papuc)

Chirața Caraiani

Camelia Iuliana Lungu

Liana-Elena Anica-Popa

Does ESG Score Have an Impact on Corporate Profitability and Risk?

Cătălina-Ioana Toader

Radu Ciobanu

The Link Between Country Competitiveness, Corporate ESG Performance, and the UN Sustainable Development Goals

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Abstract: *The alignment between environmental, social and governance (ESG) performance, the United Nations Sustainable Development Goals (SDGs) and country's competitiveness helps academics and practitioners in observing corporate contributions to the sustainable growth, leveraging corporate environments focused on ESG aspects that have a macroeconomic impact, but a limited number of studies analyzes this link. Thus, the aim of this study is to propose a case study for which an original mapping is proposed. Data were collected from Refinitiv Eikon, for two companies (in the oil and gas and financial services sectors), located in Romania, for the financial year 2021, and from the Global Competitiveness Report published by the World Economic Forum in 2019, as it is the latest full report available. Interpretative analysis was applied to the proposed mapping of sustainability practices reflected through ESG indicators, in relation to various relevant components of six pillars from the global competitiveness index and different targets pertaining to seven SDGs. Our qualitative research included the computation of a total score based on the impact of ESG performance in pursuing the country's competitiveness and SDGs. Our results show that in Romania, the largest oil and gas company disclosed quantitative and qualitative information on ESG indicators and obtained a score (25) which is equal to the one obtained by the analyzed bank, the largest in Romania. The highest contribution to reaching the country's competitiveness and SDGs is related to the social pillar, especially the workforce dimension, for both organizations. Thus, corporate ESG performance is mapped to six pillars out of 12 regarding country competitiveness and to seven SDGs out of 17, for entities activating in either financial or non-financial industries, with different weight allocated to each of the three ESG pillars. This research is important for various stakeholders, such as governments, business, and civil society, depending on the role within the organization, either direct or indirect.*

Keywords: ESG performance, country competitiveness, environment, social, governance.

1. Introduction

In 1971, the World Economic Forum (WEF) was established as a not-for-profit foundation, representing the International Organization for Public-Private Cooperation with the headquarters in Geneva, Switzerland. It engages the foremost business, political, cultural, and other leaders of society to shape worldwide and industry agendas (https://www.weforum.org/about/world-economic-forum). WEF publishes the *Global Competitiveness Reports* in which the global competitiveness index (GCI) is computed,

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the latest full report being published in 2019 and analyzing 141 economies, which account for 99% of the world's global domestic product. The GCI is a measure of national competitiveness, and it represents the aggregation of 103 individual indicators that are obtained through a combination of data from several international organizations, as well as from the World Economic Forum's Executive Opinion Survey. These indicators are grouped into 12 pillars, as follows: institutions, infrastructure, information and communication technologies (ICT) adoption, macroeconomic stability, health, skills, product market, labor market, financial system, market size, business dynamism and innovation capability.

In 2015, all United Nations (UN) member states adopted the 2030 Agenda for Sustainable Development containing 17 Sustainable Development Goals (SDGs, https://sdgs.un.org/goals), in a global partnership that has multiple objectives, such as ending poverty, improving health and education, reducing inequality, supporting economic growth, preserving oceans and forests, and addressing climate change. Therefore, there is global pressure on the achievement of the SDGs from worldwide stakeholders. Also, the adoption of the SDGs represents an unprecedented global compass in navigating sustainability changes (Del Río Castro *et al.*, 2021). It also represents an opportunity for powerful parties worldwide to work together to achieve significant gains in terms of reduced poverty and securing a more sustainable future for humanity and the planet (Scheyvens *et al.*, 2016). Various actors, such as government, businesses and civil society, are expected to be equally responsible for progression on a more sustainable path forward (Scheyvens *et al.*, 2016). While government pressure plays a significant role, incorporating SDGs into business targets leads to improved environmental performance in terms of carbon dioxide emissions, waste management, energy consumption, resource efficiency, water management and pollution emissions (Nishitani *et al.*, 2021). Conversely, Ike *et al.* (2019) mentioned that the private sector plays a key role in achieving the SDGs through corporate sustainability actions.

Environmental, social and governance (ESG) goals create value for all stakeholders and sustainable management practices, if they are clearly defined and communicated within organizations and society, balancing the desirable with the feasible. At the WEF annual meeting held in Davos during 16 and 20 January 2023, among various topics, it was discussed that ESG: (1) is a leadership issue; (2) is a standing high-priority topic for the supervisory boards; (3) should go beyond "E" and not solely focus on environmental targets; (4) there is no use if only top management knows about ESG goals; (5) can become a power booster in the hiring process (https://www.weforum.org/agenda/2023/01/esg-business-strategy-north-star-davos23/).

In a systematic literature review on a sample of 101 papers published in the period 2015-2020, Mio *et al.* (2020) observed that the main topics discussed by researchers are related to strategy execution. From a different perspective, ESG scores provide insight into the role of companies in strengthening sustainability performance (Dicuonzo *et al.*, 2022). The academic literature is interested in measuring and tracking contributions of companies towards SDG implementation. Thus, it is important to identify different indicators that can be computed based on available ESG data, to explore corporate contributions towards SDGs and align corporate strategies with the UN 2030 Agenda applicable worldwide. It is necessary to map ESG scores to the SDGs, for companies to be able to align sustainability practices to SDGs, to measure progress and plan for new solutions, allowing an appropriate level of responsibility and reporting quantitative information on how the SDGs are achieved. However, as Khaled *et al.* (2021) also noted, these studies are scarce.

Our research is motivated by a limited number of studies that analyze the association between corporate ESG performance and the country's competitiveness, as well as the contribution of the company's ESG indicators to its sustainable growth (Dragomir *et al.*, 2022). The research objective is achieved through the results obtained from a case study of two entities, one from the oil and gas sector, and the other from financial services, and our own proposed mapping between ESG indicators, components of six pillars of GCI and seven SDGs of the United Nations.

The structure of this study is as follows. A brief review of the literature supports the research objective. The methodology is presented, including the data source and the applied research method. The results and discussions contain aspects for each of the two entities selected for the case study, with respect to each pillar of GCI mapped to ESG indicators and SDG targets. The method includes a comparison based on the score computed by taking into consideration the original mapping. Finally, the last section presents the conclusions.

2. Literature review

Petrylė (2017) examined the relationship between the GCI and the economic growth, measured through the gross domestic product (GDP) growth, of 27 European Union countries, plus Norway, Switzerland, Iceland, the United States and the Russian Federation, over 2006-2015 and found a weak or no relationship. However, a negative relationship was obtained between the GCI and the standard deviation of GDP's growth of the country. This means that even though the GCI is not capable of forecasting GDP growth, GCI may indicate if the country avoids significant variances in its GDP growth rates and if it maintains the sustainable economic growth over time.

Rusu and Roman (2018), on a sample of ten countries (Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, Slovenia and Slovakia), for the period 2004-2016, found significant differences between the countries, even though all are considered part of Emerging Europe, when analyzing the main economic factors that influence the competitiveness of Central and Eastern European (CEE) region, the latter being measured through GCI. In addition, for efficiency-driven countries, factors such as GDP, inflation rate, trade, labor productivity and costs represent significant determinants of competitiveness, while for innovation-driven countries the determinants of competitiveness are represented by GDP, inflation rate, tax rate, trade and costs.

Benítez-Márquez *et al.* (2022) proposed an alternative competitiveness index to the one computed by the World Economic Forum, which does not include any valuation from opinion surveys given to entrepreneurs and executives, encompassing only quantitative indicators. The results obtained on 79 countries for which data was available for 2007-2008, respectively for 2010-2011 periods, reflected that the composition of the lower quintile for the two time periods is very similar and over 50% of the countries included in this quintile are from Africa. Similarly, all the countries classified in the upper quintile for the 2007–2008 period, except for Israel, remain in the same quintile for the

2010–2011 period. Moreover, the authors found that the most competitive countries include the United States of America, China, Taiwan, and Singapore, as well as other countries located in Central and Northern Europe, such as Germany, Austria, Denmark, Finland, France, Holland, Norway, United Kingdom, Sweden, and Switzerland.

The relationship between environmental, social and financial performance in the banking sector was analyzed by Bătae *et al.* (2021) in a study that comprised 39 European financial institutions, for the period 2010 – 2019. The results show a positive relationship between emission reductions and financial performance, while corporate governance quality has a negative contribution to accounting performance and market valuation. Moreover, Bătae *et al.* (2021) noted that the prediction of stakeholder theory regarding the positive relationship between social responsibility and financial performance was rejected. In a study on 108 European banks, for 2018, Bătae *et al.* (2020) did not observe any significant differences in the environmental and social pillar scores when comparing countries located in Developed Europe to the ones part of Emerging Europe, while the governance pillar score is significantly higher in Developed Europe.

Even though there are studies analyzing GCI and ESG pillars separately (Danila *et al.*, 2022), to the best of our knowledge, there is no research that focuses on the association between GCI and indicators that measure corporate ESG performance. However, more research has been dedicated to the relationship between ESG and the companies' contribution to the SDGs. Khaled *et al.* (2021) mentioned the option of determining the impact on the SDGs in relation to ESG scores. However, there is no direct link between ESG scores and SDGs. Additionally, Bennich *et al.* (2020) noted that there is no general agreement on taking a quantitative approach to SDGs. Also, García-Meca and Martínez-Ferrero (2021) examined whether SDG reporting is symbolic or substantive. Although each SDG is considered of equal significance, the interpretation and prioritization of SDG implementation is up to each individual firm (Ike *et al.*, 2019).

Khaled *et al.* (2021) applied a mapping process between SDG targets and corporate sustainability practices reflected in ESG scores. Different SDG targets are more relevant to the business sector than others. In their study on 1105 companies from 11 industries, the results show that profitable and larger companies, with lower leverage, are more likely to be characterized by better corporate sustainability performance. In addition, their findings link future results on sustainability performance (micro level) to the achievement of SDGs (macro level), allowing a better understanding of corporate ESG performance within the SDGs (Khaled *et al.*, 2021).

The relationship between early adoption of SDG targets and GRI reporting was analyzed by Rosati and Faria (2019b) on data for 408 organizations worldwide. The results show that early adoption of SDG reporting is linked to a higher commitment to sustainability frameworks and external assurance, a higher level of intangible assets, a younger board of directors and a higher proportion of female directors.

Pizzi *et al.* (2020) reviewed 266 articles published between 2012 and 2019, on the SDGs and their impact on business organizations. The authors noted the existence of four research themes: technological innovation, firms' contributions in developing countries, non-financial reporting, and education for the SDGs. Also, the authors emphasize the importance of understanding "how" and "to what extent" the SDGs can strengthen business strategy and the measurement of corporate performance. Growing expectations are noted in respect of digitalization and its added value in pursuing the SDGs (Del Río Castro *et al.*, 2021).

Rosati and Faria (2019a) observed that organizations reporting on the SDGs are more likely to be located in countries exposed to higher levels of climate change vulnerability, tertiary education, indulgence and individualism, and lower levels of market coordination, by analyzing 2413 sustainability reports published by companies located in 90 countries. Climate change disrupts global industrial supply chains, reduces labor productivity and causes business operations to shut down (Chen *et al.*, 2022).

Pizzi *et al.* (2021) conducted an analysis on the non-financial reports of 153 Italian public interest entities, introducing an SDG reporting score as a qualitative proxy representing various determinants, such as the presence of independent directors on the board of directors (governance-level determinant), expertise with non-financial reporting, as well as the length of the final report (report-level determinants). In addition, the results highlighted that the oil and gas sector is the most SDG-oriented, while the healthcare sector is the opposite. Thus, companies that operate in one of the most environmentally sensitive industries are more focused on disclosing information on SDGs. Similarly, García-Meca and Martínez-Ferrero (2021), in a study on 523 firm-year observations for the period between 2015 and 2016, confirmed that SDG reporting has an effect on companies' performance in various controversial sectors, such as gambling, alcohol, tobacco, firearms and environmentally sensitive industries. However, the findings suggested that SDG reporting has more than a symbolic value in those companies in which stakeholders are concerned about environmental and ethical issues (García-Meca and Martínez-Ferrero, 2021). On the other hand, Bose and Khan (2022) observed that higher SDG reporting is applied in shareholder-oriented countries, rather than stakeholder-oriented ones, in their study on 6942 company-year observations for 30 countries, in the period 2016-2019.

Van der Waal and Thijssens (2020) explained that the lack of meaningful SDG disclosures leads to difficulties for stakeholders when making decisions based on published sustainability reports. In the first stage of analysis, the sustainability reports for 1165 companies for 2017 were reviewed and limited corporate involvement in the SDGs was observed, inspired by a mixture of both legitimacy and institutional motivations. In the second stage of the analysis, the sample was limited to the 30 most extensive SDG reporters, and the results revealed that a company's SDG involvement is rather symbolic than substantive, suggesting that the SDGs are treated as non-committal disclosures that facilitate impression management (van der Waal and Thijssens, 2020).

3. Methodology

This study is based mainly on data collected from Refinitiv Eikon (formerly Thomson Reuters). The reason for choosing this database is related to its use by many researchers, being one of the most comprehensive ESG databases available for all industries (Radu and Dragomir, 2022). Refinitiv Eikon includes 186 comparable measures of ESG scoring, with more than 630 data points, ratios and analytics, which are grouped in ten categories associated with three pillars. Resource use, emissions and innovation are linked to the environmental pillar, while workforce, human rights, community, and product responsibility are included in the social pillar. Management, shareholders and CSR strategy are related to the governance pillar (Refinitiv, 2022). Data from Refinitiv was mapped against the latest available full Global Competitiveness Report issued in 2019 by the World Economic Forum (WEF), which covers 141 economies. Such data refer to the scores registered by different components of the pillars which form the Global Competitiveness Index (GCI). Also, the CSR strategy score includes various indicators, including SDGs. Seven SDGs were mapped to ESG indicators and components of six pillars of GCI.

To ensure that sufficient data are available, we considered in our sample the Romanian companies that have detailed ESG information available in Refinitiv. The financial year 2021 was the most recent year for which such information was disclosed. Thus, in the case of Romania, only two entities were selected, the largest listed companies on the Bucharest Stock Exchange. These are OMV Petrom SA, an oil and gas company, respectively, Banca Transilvania SA, the largest financial institution. However, GCI data for Romania is related to 2019, as it represents the year in which the latest available full report published by WEF is available.

To assess the contribution of ESG performance to the country's competitiveness and the UN SDGs, a qualitative research method was designed using interpretive analysis of the data reported in Refinitiv. Thus, such an interpretive analysis was applied to our own mapping of sustainability practices reflected through each ESG indicator, in relation to six pillars of the GCI, such as pillar 1 (institutions), pillar 2 (infrastructure), pillar 5 (health), pillar 6 (skills), pillar 8 (labor market), and pillar 12 (innovation capability). The interpretive analysis was also applied to the mapping of sustainability practices reflected through each ESG indicator, in relation to seven SDGs, which are represented by SDG 4 – quality education, SDG 5 – gender equality, SDG 6 – clean water and sanitation, SDG 7 – affordable and clean energy, SDG 8 – decent work and economic growth, SDG 12 – responsible consumption and production and SDG 16 – peace, justice and strong institutions. This linkage was also explored by Khaled *et al.* (2021) in their study which included a sample of 1105 companies analyzed between 2002 and 2018.

The qualitative research method includes various steps such as: the identification of the pillars only that are relevant to organizations (not at the macroeconomic level), determining relevant components of the pillars of a country's competitiveness, identifying the scores of such components as reported by WEF, mapping these components to different ESG indicators, the identification of the SDGs for which data are available, the identification of the SDG targets to which data collected is related to, mapping of such targets to some of the 186 comparable measures to which they might be relevant, by considering the descriptive data included in Refinitiv.

Our results used in the mapping process are linked to six out of 12 GCI pillars, respectively to seven out of 17 SDGs, as mentioned above. For the components of GCI that could be mapped to different ESG indicators, we assigned the score that represented the number of such indicators that we were able to correlate. Finally, a total score was calculated for each entity to assess the sustainability impact in pursuing the country's competitiveness. We noted that not all SDGs could be mapped to the information disclosed by the selected entities. For such cases, we allocated the score 0, as no values were reported.

4. Results and discussions

Our main results are highlighted for both organizations that are part of the case study, for the applicable GCI pillars and SDGs that were mapped to ESG indicators.

Pillar 1 (institutions) includes security, social capital, checks and balances, public-sector performance, transparency, property rights, corporate governance, and future orientation of government, each being represented by various components.

Linked to corruption (1.13), perceptions of corruption in the public sector are measured by the corruption perceptions index, which ranges between 0 (highly corrupt) and 100 (very clean) and aggregates data from multiple sources that include perceptions of country experts and businesspeople. In 2021, the corruption perception index in Romania was 45, while in 2019 it was 47, which suggests that the perception of corruption is quite high (https://www.transparency.org/en/countries/romania). OMV Petrom discloses that it achieves the sustainable development goal 16 (peace and justice strong institutions) through its implemented zero-tolerance policy for bribery, fraud, theft and various other types of corruption. Core policies, such as the code of conduct and code of business ethics, help the company to ensure that an ethical behavior is in place, leading to a good reputation which supports the processes of building and maintaining the trust of business partners, customers and stakeholders. In terms of whistleblowing, OMV Petrom has a designated platform, which is available via the internet and is operated by an independent third party, ensuring appropriate levels of confidentiality and anonymity. Also, the company has in place a compliance management system, for which reasonable assurance was obtained through an audit exercise that tested the design, implementation, appropriateness and effectiveness of this system, in line with international standard IDW PS 980. This system contains instructions, internal rules, processes and controls that have the objective to prevent, detect and monitor potential deviations from business ethics. Awareness on ethical values and principles towards employees is ensured through training on antitrust and business ethics.

The strength of auditing and accounting standards (1.17) stores information on how strong financial auditing and reporting standards in Romania are. This indicator ranges between 1 (extremely weak) and 7 (extremely strong), the value recorded for Romania being 4.8. OMV Petrom has an audit committee composed of five independent members, and it has different responsibilities on financial reporting, external audit, internal audit, internal controls and risk management, compliance, conduct and conflicts of interest. This committee meets on a regular basis, at least three times per year, and on an extraordinary basis if required.

Regarding conflict-of-interest regulation (1.18), GCI uses an index that measures the protection of shareholders against directors' misuse of corporate assets for personal gain, with values in the interval 0-10 (best), Romania registering 6. The conflict-of-interest index assesses three dimensions of applicable regulation: transparency of related-party transactions, shareholders' ability to sue and hold directors liable for self-dealing, and access to evidence and allocation of legal expenses in shareholder litigation. OMV Petrom discloses information on the internal audit department which reports to the audit committee on various topics, including internal audit, compliance, conduct and conflicts of interest.

Linked to shareholder governance (1.19), the index measures shareholders' rights in corporate governance, with values between 0 and 10 (best), Romania being evaluated at 6. Three dimensions of governance are assessed: shareholders' rights and role in major corporate decisions, governance safeguards protecting shareholders from undue board control and entrenchment, and corporate transparency on ownership stakes, compensation, audits, and financial prospects. OMV Petrom has in place the equal voting right policy, observing the one share, one vote and one dividend principle. Also, it is disclosed that the shareholders of the company, regardless of their participation held in the share capital, may ask questions either in writing or verbally regarding the topics from the general shareholders meeting minute. Thus, the shareholder engagement policy may be applicable.

Regarding SDG 16 (peace, justice, and strong institutions), the company claims to pursue SDG targets 16.3, 16.5 and 16.6. The targets related to the rule of law at the national and international levels (16.3) are achieved by introducing a policy on fair competition related to partners, suppliers and contractors, and provisions related to antitrust law. On the target related to reducing corruption and bribery (16.5), OMV Petrom discloses three relevant policies: the code of business ethics, whistleblower protection and the company's policy on bribery. The code of ethics covers a multitude of aspects related to conflicts of interest, gifts, donations, trade sanctions, embargoes etc. On the topic of corporate governance linked to the development of effective, accountable and transparent institutions at all levels (16.6), OMV Petrom presents its board policies regarding director diversity, independence, background, skills and experience.

In relation to energy efficiency regulation (1.24), the score ranges from 0 (not conducive) to 100 (very conducive), Romania's value being 85.4, and is based on twelve indicators, including national energy efficiency planning, information provided to consumers about electricity usage etc. OMV Petrom has a policy which governs energy efficiency. An example is represented by the corporate initiatives included the replacing of the classic lighting with LED technology in Petrom City, to save energy.

In terms of the renewable energy regulation (1.25), this criterion assesses a country's policies to promote renewable energies, ranging between 0 and 100 (best), in case of Romania being 68.3, which is based on a country's performance regarding seven indicators: legal framework for renewable energy, planning for renewable energy expansion, incentives and regulatory support for renewable energy, attributes of financial and regulatory incentives. In terms of renewable energy use, no information reported was noted for OMV Petrom.

Linked to Pillar 1, targets 7.2 and 7.3 of SDG 7 (affordable and clean energy) are disclosed. On the target related to increasing the share of renewable energy in the global energy mix (7.2), the company's carbon efficiency agenda focuses on process optimization and energy efficiency, by using renewable energy, and implementing projects that reduce natural gas venting and flaring. On the target of doubling the global rate of improvement in energy efficiency (7.3), OMV Petrom registered a total energy use of 45,060,000 gigajoules and implemented a policy on energy efficiency, disclosing different corporate initiatives, such as the replacement of classic lighting with LED technology in Petrom City.

Pillar 2 (infrastructure) comprises transport infrastructure and utility infrastructure. On the exposure to unsafe drinking water (2.11), which considers the extent of exposure by risk level and the severity of that risk's contribution to disease burden, Romania registered a value of 8.5%, which is significantly low. OMV Petrom measures the water discharged, in 2021 being 10,015 megaliters, being represented mainly by surface water (9,110 megaliters). Regarding the reliability of water supply (2.12), Romania recorded a value of 5.2, the range being 1 to 7 (best). Approximately 80% of the priority sites operated by OMV Petrom completed water management plans, while for the remaining ones, such plans are in progress. The key goals in respect to water management are to reduce water consumption, utilize water in an efficient manner and treat wastewater appropriately, in line with the water efficiency policy and defined targets on water efficiency.

Linked to SDG 6 (clean water and sanitation), OMV Petrom claims to follow SDG targets 6.3 and 6.4. The company pursues the target of improving water quality by reducing pollution and minimizing the release of hazardous chemicals (target 6.3) through different actions that resulted in 10,015,000 megaliters of water discharged. On the target related to increasing water efficiency, ensuring sustainable withdrawals and freshwater supply to reduce water scarcity (target 6.4), OMV Petrom recycled 313,206,000 megaliters of water. The company reported 9,419.14 cubic meters/USD million, representing total water withdrawal in cubic meters divided by net sales or revenue in USD million. Around 80% of the priority sites operated by OMV Petrom completed water management plans, while for the remaining ones, such plans are in progress. The water that results from the crude oil extraction process is treated by using an activated carbon filtration system before such water is discharged into the Barcău river. The key goals in respect to water management are to reduce water consumption, utilize water in an efficient manner and treat wastewater appropriately, in line with the water efficiency policy and defined targets on water efficiency.

Pillar 5 (health) includes healthy life expectancy which is computed as the number of years that a newborn can expect to live in good health, considering estimates on mortality and disability. On healthy life expectancy component (5.01), Romania records a score of 77.2, which is quite high. OMV Petrom discloses that it has in place policies on employee health and safety, follows standards such as OHSAS 18001 and trains employees in health and safety matters. The company pursued to consolidate the safety culture program at operational sites through different activities, such as: quarterly local safety committees and working groups formed by local employees assigned to improve safety topics, such as slips, falls, work permits, pressure tests etc. Also, in terms of the tone from the top, employees are encouraged to bring to management's attention any unsafe conditions and behaviors. Monitoring is in place, and an example is the third-party risk assessment performed on health, safety, security and environment areas. Good safety behavior is acknowledged within the company through the *Report of the month*. Also, quantitative information is disclosed in terms of health and safety training, 208 employees completing the first aid basic training and approximately 290 employees receiving refresher training, containing both safety alerts and lessons learned sessions. Moreover, in terms of ISO 45001, the certification covers 49% of the company's employees in all OMV Petrom business divisions.

In relation to SDG 8 (decent work and economic growth), OMV Petrom claims to follow the progress with respect to the target on the protection of labor rights and the promotion of safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment (target 8.8). The injury rate in 2021 was 0.53, increasing from 0.29, computed as the total number of injuries and fatalities including no-lost-time injuries relative to one million hours worked, while the number of employee accidents decreased from 8 to 7 in 2021, compared to 2020. The company implemented a policy on freedom of association, so that it has in place collective agreements providing specific rights and obligations for employees, their representatives and the employer within a transparent and predictable frame. Also, OMV Petrom's actions are guided by fundamental human rights, recognizing and protecting the dignity of all human beings as a principles-based approach to doing business, in the areas of human rights, labor and community care.

Pillar 6 (skills) is represented by skills of the current and future workforce. The education of the current workforce is measured through the average period of schooling, and skills are measured through different indicators, such as training and its quality, skillset of graduates, existence of digital skills as well as the ease of finding skilled employees.

Concerning the extent of staff training (6.02), the value recorded by Romania is 3.7, considering the range 1 to 7 (best), which suggests that the investment in training and employee development is moderate. OMV Petrom discloses information on policies regarding skills training and career development. There are different programs available, such as *First-time leaders 2.0* designed to build leadership skills, *Leadership essentials* meant to support managers in acquiring people management skills, *Leading remote/hybrid teams* which helps in upskilling current leaders on adapting to various challenges, digital tools, and coaching roles, and *Digital skills for leaders* which helps managers in succeeding in uncertain environments. Also, OMV Petrom offers a three-year professional development plan to its employees, including mentoring, innovative projects, mixt learning methodologies through team interaction, direct professional experience and special training programs. Moreover, corporate contributions to the SDG 4 (quality education) are operationalized through multiple initiatives addressing education, environment and vulnerable people. Appropriate monitoring actions are applied by the company, and awareness is raised through a total number of 110,887 hours of training.

On SDG 4 (quality education), target 4.7, which regards the acquisition of knowledge and skills needed to promote sustainable development, is pursued by OMV Petrom. The company trains its suppliers through awareness sessions on sustainable procurement, including the carbon footprint of purchased goods and services, and sustainability in acquisitions. Also, the company discloses information on policies regarding skills training and career development. There are different programs available, such as *First time leaders 2.0* designed to build leadership skills, *Leadership essentials* meant to support managers in acquiring people management skills, *Leading remote/hybrid teams* which helps in upskilling current leaders on adapting to various challenges, digital tools, coaching roles, and *Digital skills for leaders* which helps managers in succeeding in uncertain environments. Appropriate oversight actions are in place, as training hours per employee are adequately monitored. OMV Petrom offers a three-year professional development plan to its employees, including mentoring, innovative projects, mixt learning methodologies through team interaction, direct professional experience and special training programs.

Pillar 8 (labor market) corresponds to flexibility, meritocracy and incentivization. In respect of hiring and firing practices (8.02), the value observed for Romania is 4.4, on a range 1 to 7 (best). Quantitative information is disclosed by OMV Petrom regarding new employees hired, which are categorized by age group (<30, 30-50 and >50) and gender. In Romania, at the level of the OMV Petrom group, there were 139 new employees hired in 2021, mainly between the age of 30 and 50 (74), followed by the ones younger than 30 years (59). In terms of employee turnover, a total of 2580 employees left the company, mainly from the group that includes persons over 50 years (1728).

On the cooperation in labor-employee relations (8.03), the value recorded by Romania is 4.3, on a scale of 1 (generally confrontational) to 7 (generally cooperative). OMV Petrom only discloses qualitative information on the flexi-desk program, which provides more flexibility and ensures a higher utilization of office space. No quantitative information reported was noted.

Relative to workers' rights (8.06), the index for Romania is 73, considering the range 0 to 100 (high protection), and measures the level of protection of internationally recognized core labor standards. Dimensions of labor protection include civil rights, the right to bargain collectively, the right to strike, the right to associate freely, and access to due process rights. OMV Petrom discloses that it values the employer-union relationship, which is essential in maintaining the company's social equilibrium, and continues the dialogues with trade unions to find common approaches to new challenges that the business environment and employees are facing. All employees were subject to a collective labor agreement, while 87.39% were represented by the company's local trade unions.

On the reliance on professional management (8.09), Romania scores 3.9, within the range of 1 to 7 (mostly professional managers chosen for merit and qualifications). Training programs are in place for management, as OMV Petrom discloses key programs, such as *Leadership Essentials* or *Digital skills for leaders*.

Regarding the ratio of wage equality gap and salaried female workers to male workers (8.11), Romania's score is 70.7, which is quite high. OMV Petrom has 27.08% women employees and women managers represent 30.6% of total managers. In terms of new employees, 29.88% are represented by women. OMV Petrom discloses that it is on course to reach its 30% target for 2025, with a proportion of women employees of 27.08%, having established its group diversity, equity and inclusion strategic direction, with a focus on gender and internationality.

Regarding SDG 5 (gender equality), target 5.1 is pursued in terms of ending all forms of discrimination against women. The group's diversity, equity and inclusion strategy is focused on gender equality, including the increase in the share of women in management positions and leadership roles. OMV Petrom discloses that it is on course to reach its 30% target for 2025, with a proportion of women employees of 27.08%.

Pillar 12 (innovation capability) is linked to diversity and collaboration, research and development and commercialization. On diversity of workforce (12.01), Romania scores 70.9, on a scale of 1 to 100. Concerning research and development expenditures (12.07), the score of Romania is significantly low, 16.1, considering the interval 0-100.

OMV Petrom assumes the responsibility of providing high-quality and safe products. Actions are taken in respect of reducing the environmental impact during the product life cycle, by using technologically advanced solutions, while complying with international requirements and performing risk assessments for all products or hazardous substances contained in products. Also, one of the objectives is to continue to minimize the potential chemical hazards and associated risks to products included in the portfolio.

In relation to SDG 12 (responsible consumption and production), the target of supporting developing countries in strengthening their scientific and technological capacity (target 12.a) is pursued by the company. OMV Petrom assumes the responsibility of providing high-quality and safe products. Actions are taken in respect of reducing the environmental impact during the product life cycle, by using technologically advanced solutions, while complying with international requirements and performing risk assessments for all products or hazardous substances contained in products.

Table 1. **Score of the link between Romania's competitiveness and ESG for OMV Petrom SA**

Pillar	Comp.	ESG Pillars	ESG Indicators	SDGs	Score
1	1.13	CSR Strategy (G)	SDG 16 - Peace and justice strong institutions	16	1
	1.17	Management (G)	Audit Board Committee Audit Committee mgt independence	16	2
	1.18	Management (G)	Internal audit department reporting	16	1
	1.19	Shareholders (G)	Policy equal voting right Policy shareholder engagement	16	2
	1.24	Resource use (E)	Policy energy efficiency	7.3	1
	1.25	Resource use (E)	Renewable energy use	7.2	0
2	2.11	Emissions (E)	Water discharged	6.3	1
	2.12	Resource use (E)	Policy water efficiency	6.4	1
5	5.01	Workforce (S)	Policy employee health and safety Health and safety training Employees health and safety OHSAS 18001	8.8	3
6	6.02	Workforce (S)	Policy skills training Policy career development SDG 4 Quality education Training hours total	4.7	4
8	8.02	Workforce (S)	Turnover of employees	5.1	1
	8.03	Workforce (S)	Flexible working hours	5.1	0
	8.06	Workforce (S)	Trade Union Representation	5.1	1
	8.09	Workforce (S)	Management training	5.1	1
	8.11	Workforce (S)	Women employees New women employees Women managers	5.1	3

Pillar	Comp.	ESG Pillars	ESG Indicators	SDGs	Score
12	12.01	Workforce (S)	Policy diversity and opportunity Targets diversity and opportunity	5.1	2
	12.07	Innovation (E)	Environmental products	12.a	1
TOTAL					25

(*Source*: Authors' own research)

Banca Transilvania (BT) is the largest banking institution in Romania by assets and market share. Therefore, it contributes to the competitiveness of Romania, on multiple aspects. On the matter of tackling corruption (Pillar 1, component 1.13), BT discloses that it achieves SDG 16 (peace and justice strong institutions) and maps it to Global Reporting Initiatives (GRI) Standards: 102-16 *Values, principles, standards, and norms of behavior*, 102-17 *Mechanisms for advice and concerns about ethics*, 102-25 *Conflicts of interest*, 205-2 *Communication and training about anti-corruption policies and procedures*, 205-3 *Confirmed incidents of corruption and actions taken*, 206-1 *Legal actions for anti-competitive behavior, anti-trust, and monopoly practices*, and 415-1 *Political Public policy contributions*,. Also, a total of 6,604 employees were trained on anti-corruption policies and procedures, while there were no confirmed incidents of corruption which would lead to dismissal or disciplinary actions against employees, termination or suspension of collaboration with business partners or legal actions against group companies or employees alleging corruption.

Regarding the strength of auditing and accounting standards (1.17), BT has an audit committee composed of three independent members, and it has different responsibilities on financial statements, internal control, internal audit, external audit, and reporting. This committee meets any time it is necessary.

Regarding the conflict-of-interest regulations and policies (1.18), BT discloses information on the internal audit department which directly reports its findings and proposals for significant improvement of internal controls to the audit committee and the management.

Linked to shareholder governance (1.19), BT has in place the equal voting rights policy. Thus, the right to vote of any shareholder is based on the one share-one vote principle. Also, it is disclosed that the bank has in place processes which support facilitating shareholders to ask a question to the board of management. This is done through the Board of Directors meetings that are held at least monthly or any time it is considered necessary. The decisions of the Board of Directors shall be taken with an absolute majority vote of the present members, and with a quorum of at least half of the total number of directors. Each such decision must be written in a minute to be signed by the Chairman and the members of the Board of Directors.

Regarding SDG 16 (peace, justice, and strong institutions), the bank pursues SDG targets 16.5 and 16.6. On the target related to reducing corruption and bribery (16.5), BT discloses practices for the prevention of corruption and bribery, presenting examples of activities strictly forbidden at the level of BT Financial Group: receiving money or other benefits from clients or third parties to perform their duties, payment or offering a benefit that is not in compliance with domestic laws or regulations, payment or offering a benefit related to “getting” a business. Also, the bank discloses compliance with the independence and ethical requirements of the International Ethics Standards Board for Accountants. In addition, whistleblower protection is in place, and employees have the right to report any treatment that may be considered discriminatory, with the human resources department being informed in due time. On the topic of corporate governance linked to the development of effective, accountable, and transparent institutions at all levels (16.6), BT presents their board policies regarding diversity, experience, backgrounds, skills and experience. In terms of board diversity, criteria such as gender, age, cultural and educational profile, ethnicity, professional experience, skills, knowledge, and work experience are considered.

In relation to energy efficiency regulation (1.24), BT has a policy which governs energy efficiency and continuously implements measures that contribute to reducing energy consumption, in line with the bank's environmental policy. During 2021, 137,183.51 gigajoules were used by the bank. Moreover, BT has a financing portfolio of BREEAM-certified real estate projects with an outstanding balance of RON 358 million (https://bregroup.com/products/breeam/). In addition, the bank is an official partner of the European Energy Efficiency Fund in Romania, granting 161 loans worth RON 436 million at the start of the collaboration, with a balance at RON 31 million as of December 2020.

In terms of the renewable energy regulation (1.25), starting with 2021 the bank contracted renewable electricity supply for some of the administrative offices and agencies. Thus, 87% of BT's electricity consumption came from renewable sources, which is a significant percentage. In addition, 59% of the value of loans granted to electricity production companies represented financing for renewable energy projects.

Regarding SDG 7 (affordable and clean energy), targets 7.2 and 7.3 are identified. On the target related to increasing the share of renewable energy in the global energy mix (7.2), 87% of the electricity consumption of BT comes from renewable sources. Also, according to the Climate Assessment for Financial Institutions, one of four investment loans supported projects for energy efficiency. Thus, 14% of the value of these loans financed purchases of energy efficiency equipment, 7% was directed to energy efficient buildings, 6% to agricultural land purchases, 4% to projects that address social needs, 3% to purchases of eco-friendly cars, and 1% to other businesses with reduced environmental impact using improved technologies and equipment. Moreover, the bank entered a partnership with the European Bank for Reconstruction and Development, through the ROSEFF (Romania – SME Sustainable Energy Efficiency Financing Facility) program, through which 172 loans were granted for energy optimization, in total amount of RON 129 million, during 2019-2020, while in 2021, six loans still had outstanding balance in amount of RON 3 million. On the target of doubling the global rate of improvement in energy efficiency (target 7.3), the bank continuously implements measures that contribute to reducing energy consumption, in line with the bank's environmental policy. During 2021, 137,183.51 gigajoules were used by the bank. Moreover, BT has a financing portfolio of BREEAM-certified real estate projects with an outstanding balance of RON 358 million (https://bregroup.com/products/breeam/).

On the exposure to unsafe drinking water (Pillar 2, component 2.11), BT measures the water discharged, 49,000 cubic meters in 2021. Regarding the reliability of water supply (2.12) in daily activities, the bank uses water only for sanitary purposes, in washrooms and kitchens, and, to reduce the water consumption, BT upgraded its facilities, installing sensor taps in the toilets for both employees and customers.

Linked to SDG 6 (clean water and sanitation), BT pursues SDG targets 6.3 and 6.4. Target 6.3 (improvements in water quality by reducing pollution and minimizing the release of hazardous chemicals) is pursued by the bank through different actions that resulted in 49,000 cubic meters of water discharged. On the target related to the increase in water efficiency, BT upgraded its facilities, which included installing sensor taps in the toilets for both employees and customers.

Concerning the healthy life expectancy component (Pillar 5, component 5.01), BT discloses that it has in place policies on employee health and safety, follows standards such as OHSAS 18001 and trains employees in health and safety matters. The Physical Security Directorate is responsible for occupational health, safety (OHS) and emergency situations (ES) rules. OHS and ES activities are coordinated by the Deputy General Manager CRO (Chief Risk Officer) through the Occupational Health and Safety and Emergency Situations Prevention and Protection Service. At the branch level, a person designated with prevention and protection (OHS) and emergency training/coordination on the OHS and ES line is assigned. Reporting lines are defined and communicated appropriately to employees, including an Occupational Health and Safety Committee which meets quarterly or whenever necessary. Thus, the bank has an operational health and safety management system implemented, in line with the provisions of laws and regulations in force. The employees completed a total of 14,186 training hours on occupational health and safety topics.

In relation to SDG 8 (decent work and economic growth), BT monitors the progress with respect to the target of protecting labor rights and promoting safe and secure working environments for all workers (target 8.8). In 2021, the number of employee accidents decreased from two to one. In terms of the policy on freedom of association, the bank has a collective bargaining agreement with its employees.

Regarding the extent of staff training (Pillar 6, component 6.02), BT disclosed the total number of training hours (339,420). Professional development is encouraged by the bank through both internal and external learning programs, in line with trends in the banking sector, as well as best practices. To ensure transparency and predictability in promotion and career development opportunities, BT implemented the *BT Career Plan*, from which 701 employees benefited. In addition, in 2021 the bank granted 166 loans in the amount of RON 18.76 million to companies that activate in education and training activities.

On SDG 4 (quality education), BT actively pursues target 4.7, with respect to knowledge and skills acquisition needed to promote sustainable development. The bank discloses information on training and development policy, more specifically on policies regarding skill training and career development. One of the bank's priorities is to ensure that the people who work with BT have all the channels and tools necessary to develop professionally and personally. Continuous professional development is supported by providing employees with internal and external learning programs, in line with trends and best practices in the banking system. Moreover, the program called the *BT Career Plan* was developed to ensure predictability and transparency in promotions and career development opportunities within the bank, and approximately 701 employees participated during 2021.

In respect of human resource management (Pillar 8, component 8.02), in 2021, BT Group has 11,314 employees, out of which 9,940 are in Romania and the remaining 1,374 in Moldova. Most employees are on a permanent contract (10,006). In Romania, a total of 1,425 employees were newly hired in 2021, out of which 912 are younger than 30 years, 460 employees are between the age of 30 and 50, and 53 are included in the category older than 50 years. The total turnover rate in Romania is 12.95%, which is low.

Regarding the cooperations in labor-employee relations (8.03), very limited information is disclosed by BT in terms of flexible working hours. Such a program is applied for both full-time and part-time employees, but no other quantitative information was reported. Relative to workers' rights (8.06), any employee with a permanent employment contract may apply for a representative role, and in 2021 a total number of 9,915 employees were covered by the collective labor agreement, representing a percentage of 99.75%. The organization discusses with employee representatives before making any reorganization/restructuring decisions which can affect more than 2% of employees, at least 60 days before implementation. Also, the trade union is in place at Victoriabank (a subsidiary), whose role is to support the rights of employees, by collaborating with management and being involved in various corporate activities.

Discussing the reliance on professional management (8.09), various trainings are available for all employees, including management positions. For example, BT disclosed that seven members of the board of directors, 22 executive directors, 106 department managers and 98 regional branch directors were trained on anti-corruption policies and procedures, both online and on-site.

Regarding the ratio of wage equality gap and salaried female workers to male workers (8.11), BT highlighted that 84.44% of total employees are women, while 71.92% are new female employees and 61.16% are female managers.

Regarding SDG 5 (gender equality), target 5.1 is pursued in terms of ending all forms of discrimination against women. BT aims to have a fair and equitable work environment, characterized by diversity, inclusion, and equal opportunities. Within the BT Group, the gender equality and treatment policy are in place, while the behavior expected from all people in the bank's team is outlined in the BT Financial Group's Internal Rules and Code of Ethics and Conduct. Equality of opportunity and treatment between women and men is in place, while women employees are in the percentage of 84.44%.

On the diversity of workforce (Pillar 12, component 12.01), BT aims to have a fair and equitable work environment, characterized by diversity, inclusion, and equal opportunities. Within the BT Group, the gender equality policy is in place. Diversity is part of the 'People' pillar, one of the three main pillars of BT's sustainable development strategy. The implementation of a diversity and equal opportunities awareness program is performed through campaigns and training sessions. However, no information on targets or opportunities was reported.

Concerning research and development expenditures (12.07), as of 2017 the bank had been in partnership with the European Bank for Reconstruction and Development to provide green loans to private individuals, for the purchase of energy-efficient residential properties or goods. BT was one of the first banks to join the *Green Economy Financing Facility* program, granting loans amounting to RON 40 million, most of them being used to purchase residential properties (RON 37.7 million). Also, such facilities also had commercial discounts in terms of interest and fees. In addition, the financing portfolio of BREEAM-certified real estate projects includes an outstanding balance of RON 358 million. Other positive environmental financing initiatives are sustained by BT, such as waste collection, recycling and management. BT subsidiaries support the sustainable strategy at the level of the group.

In relation to SDG 12 (responsible consumption and production), the bank claims that it pursues the goal of supporting developing countries to strengthen their scientific and technological capacity (12.a). As of 2017, the bank had been in partnership with the European Bank for Reconstruction and Development to provide green loans to private individuals, either for the purchase of energy-efficient residential properties or goods. BT was one of the first banks to join the *Green Economy Financing Facility* program, granting loans amounting to RON 40 million, most of them being used to purchase residential properties.

Table 2. **Score of the link between Romania's competitiveness and ESG for Banca Transilvania**

Pillar	Comp.	ESG Pillars	ESG Indicators	SDGs	Score
1	1.13	CSR Strategy (G)	SDG 16 - Peace and justice strong institutions	16	1
	1.17	Management (G)	Audit Board Committee existence Audit Committee independence	16	2
	1.18	Management (G)	Internal audit department reporting	16	1
	1.19	Shareholders (G)	Policy equal voting right Policy shareholder engagement	16	2
	1.24	Resource use (E)	Policy energy efficiency	7.3	1
	1.25	Resource use (E)	Renewable energy use	7.2	1
2	2.11	Emissions (E)	Water discharged	6.3	1
	2.12	Resource use (E)	Policy water efficiency	6.4	1
5	5.01	Workforce (S)	Policy employee health and safety Health and safety training Employees health and safety OHSAS 18001	8.8	3
6	6.02	Workforce (S)	Policy skills training Policy career development SDG 4 Quality education Training hours total	4.7	4
8	8.02	Workforce (S)	Turnover of employees	5.1	1
	8.03	Workforce (S)	Flexible working hours	5.1	0
	8.06	Workforce (S)	Trade Union Representation	5.1	1
	8.09	Workforce (S)	Management training	5.1	1

Pillar	Comp.	ESG Pillars	ESG Indicators	SDGs	Score
	8.11	Workforce (S)	Women employees New women employees Women managers	5.1	3
12	12.01	Workforce (S)	Policy diversity and opportunity Targets diversity and opportunity	5.1	1
	12.07	Innovation (E)	Environmental products	12.a	1
TOTAL					25

(*Source*: Authors' own research)

The results show a total score of 25 for both OMV Petrom and BT. Also, in the case of OMV Petrom, the information was analyzed for six pillars out of 12, and in case of pillar 1 and pillar 8, no information was reported on two corresponding ESG indicators. The results are similar for BT, the difference being the fact that, in case of pillar 8 and pillar 12, no information was reported on two mapped ESG indicators.

Our findings highlight the fact that, in the case of OMV Petrom, the social pillar contributes the most to the country's competitiveness, in a percentage of 60%, followed by the governance pillar (24%) and the environmental pillar (16%). At a more disaggregated level, in the case of the social pillar, the score is allocated only to the workforce dimension (15). For the environmental pillar, information on resource use had the highest score (2), followed by emissions (1) and innovation (1). The governance pillar also contributed to the achievement of the country's competitiveness ranking, where the management dimension obtained a score of 3, followed by shareholders (2) and CSR strategy (1) dimensions.

Similarly, for Banca Transilvania, our results show that the social pillar contributes the most to the country's competitiveness, in percentage of 56%, followed by the governance pillar (24%) and the environmental pillar (20%). At a more disaggregated level, in the case of the social pillar, the score is recorded only by the workforce dimension (14). For the environmental pillar, resource use had the highest score (3), followed by emissions (1) and innovation (1). The governance pillar also contributed to the achievement of the country's competitiveness, where the management dimension obtained a score of 3, followed by shareholders (2) and CSR strategy (1) dimensions. In terms of reporting and contribution to country competitiveness, the two companies, from very different industries, have a relatively similar profile. This is mainly due to their size and market share in the Romanian economy.

5. Conclusions

Our results show that, in Romania, the largest oil and gas company disclosed information on ESG indicators and obtained a score of 25, which is equal to the one obtained by the analyzed bank. The highest contribution towards the achievement of the country's competitiveness and SDGs pertains to the social pillar, more specifically to the workforce dimension. These results apply also to the bank workforce dimension. Thus, corporate ESG performance is linked to the country's competitiveness and SDGs, for entities activating in either financial or non-financial industries, with similar priority allocated to the social pillar.

Our research is relevant to different stakeholders, as it provides theoretical and practical implications. The reporting attitudes of managers can be adjusted once they understand the link between corporate ESG performance and the country's competitiveness on different pillars. Banks and other financing institutions may consider the contribution of a company towards a country's competitiveness and SDG achievement, before granting loans or when a more favorable interest may be offered to those companies that contribute more to the country's competitiveness. Shareholders are better informed through the integrated reporting framework, allowing them to make more timely investment decisions on investments that are more sustainable. Lastly, regulators are focused on maximizing social welfare, and may have a less interventionist approach regarding those companies that support the country's competitiveness.

This study has some limitations. First, the sample includes only two companies from Romania because sufficient data was available in Refinitiv only for OMV Petrom SA and Banca Transilvania for the financial year 2021. As such, we presumed that the data is more accurate than self-collected information because Refinitiv Eikon is subject to quality audits performed by database administrators. However, in some cases, we performed detailed interpretative analysis by reviewing the original reports published by the organizations. Also, another limitation refers to the availability of the Global Competitiveness Report, as the latest full version was published in 2019 by WEF. Finally, the sample included only two sectors, oil and gas and financial services, which might not be directly comparable.

Future analyses can focus on more than two industries to observe which contributes the most to the increase of the country's competitiveness. The results can generate different measures that support relevant investment projects. Furthermore, future research may consider the period after 2021, once the data are available, to compare the impact of the latest uncontrollable factors, such as war and inflation, on the achievement of the country's competitiveness. Different countries may be included to reach a global sample, extending the present case study that was applied only to Romania.

References

Bătae, O.M., Dragomir, V.D., & Feleagă, L. (2020) Environmental, social, governance (ESG), and financial performance of European banks, *Journal of Accounting and Management Information Systems*, vol. 19, no. 3: 480-501, https://doi.org/10.24818/jamis.2020.03003

Bătae, O.M., Dragomir, V.D., & Feleagă, L. (2021) The relationship between environmental, social, and financial performance in the banking sector: A European study. *Journal of Cleaner Production*, vol. 290: 125791, https://doi.org/10.1016/j.jclepro.2021.125791

Benítez-Márquez, M.D., Sánchez-Teba, E.M., & Coronado-Maldonado, I. (2022) An alternative index to the global competitiveness index. *PLOS ONE*, vol. 17, no. 3: e0265045, https://doi.org/10.1371/journal.pone.0265045

Bennich, T., Weitz, N., & Carlsen, H. (2020) Deciphering the scientific literature on SDG interactions: A review and reading guide. *Science of The Total Environment*, vol. 728, 138405. https://doi.org/10.1016/j.scitotenv.2020.138405

Bose, S., & Khan, H.Z. (2022) Sustainable development goals (SDGs) reporting and the role of country-level institutional factors: An international evidence, *Journal of Cleaner Production*, vol. 335: 130290, https://doi.org/10.1016/j.jclepro.2021.130290

Chen, H.M., Kuo, T.C., & Chen, J.L. (2022) Impacts on the ESG and financial performances of companies in the manufacturing industry based on the climate change related risks, *Journal of Cleaner Production*, vol. 380: 134951, https://doi.org/10.1016/j.jclepro.2022.134951

Danila, A., Horga, M.G., Oprișan, O., & Stamule, T. (2022) Good Practices on ESG Reporting in the Context of the European Green Deal, *Amfiteatru Economic*, vol. 24, no. 61: 847-860. https://doi.org/10.24818/EA/2022/61/847

Del Río Castro, G., González Fernández, M.C., & Uruburu Colsa, Á. (2021) Unleashing the convergence amid digitalization and sustainability towards pursuing the Sustainable Development Goals (SDGs): A holistic review. *Journal of Cleaner Production*, vol. 280: 122204, https://doi.org/10.1016/j.jclepro.2020.122204

Dicuonzo, G., Donofrio, F., Ranaldo, S., & Dell'Atti, V. (2022) The effect of innovation on environmental, social and governance (ESG) practices, *Meditari Accountancy Research*, vol. 30, no. 4: 1191–1209, https://doi.org/10.1108/MEDAR-12-2020-1120

Dragomir, V.D., Bătae, O.M., Ionescu, B.S., & Ionescu-Feleagă, L. (2022) The Influence of ESG Factors on Financial Performance in the Banking Sector during the Covid-19 Pandemic, *Economic Computation and Economic Cybernetics Studies and Research*, vol. 56, no. 4:71–88, https://doi.org/10.24818/18423264/56.4.22.05

García-Meca, E., & Martínez-Ferrero, J. (2021) Is SDG reporting substantial or symbolic? An examination of controversial and environmentally sensitive industries, *Journal of Cleaner Production*, vol. 298: 126781, https://doi.org/10.1016/j.jclepro.2021.126781

Ike, M., Donovan, J.D., Topple, C., & Masli, E.K. (2019) The process of selecting and prioritising corporate sustainability issues: Insights for achieving the Sustainable Development Goals, *Journal of Cleaner Production*, vol. 236: 117661, https://doi.org/10.1016/j.jclepro.2019.117661

Khaled, R., Ali, H., & Mohamed, E.K.A. (2021) The Sustainable Development Goals and corporate sustainability performance: Mapping, extent and determinants, *Journal of Cleaner Production*, vol. *311:* 127599, https://doi.org/10.1016/j.jclepro.2021.127599

Mio, C., Panfilo, S., & Blundo, B. (2020) Sustainable development goals and the strategic role of business: A systematic literature review. *Business Strategy and the Environment*, vol. 29, no. 8: 3220–3245, https://doi.org/10.1002/bse.2568

Nishitani, K., Nguyen, T.B.H., Trinh, T.Q., Wu, Q., & Kokubu, K. (2021) Are corporate environmental activities to meet sustainable development goals (SDGs) simply greenwashing? An empirical study of environmental management control systems in Vietnamese companies from the stakeholder management perspective, *Journal of Environmental Management*, vol. 296: 113364, https://doi.org/10.1016/j.jenvman.2021.113364

Petrylė, V. (2017). Does the Global Competitiveness Index demonstrate the resilience of countries to economic crises? *Ekonomika*, vol. *95, no.* 3: 28-36, https://doi.org/10.15388/Ekon.2016.3.10326

Pizzi, S., Caputo, A., Corvino, A., & Venturelli, A. (2020) Management research and the UN sustainable development goals (SDGs): A bibliometric investigation and systematic review *Journal of Cleaner Production*, vol. 276: 124033, https://doi.org/10.1016/j.jclepro.2020.124033

Pizzi, S., Rosati, F., & Venturelli, A. (2021) The determinants of business contribution to the 2030 Agenda: Introducing the SDG Reporting Score, *Business Strategy and the Environment*, vol. 30, no. 1: 404-421, https://doi.org/10.1002/bse.2628

Radu, O.M., & Dragomir, V.D. (2022) The relationship between integrated thinking and financial risk: Panel estimation in a global sample, *Risks*, vol. 11, no. 1: 6, https://doi.org/10.3390/risks11010006

Refinitiv (2022) *Environmental, social and governance scores from Refinitiv*, available at https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf

Rosati, F., & Faria, L.G.D. (2019a) Addressing the SDGs in sustainability reports: The relationship with institutional factors, *Journal of Cleaner Production*, vol. 215: 1312-1326, https://doi.org/10.1016/j.jclepro.2018.12.107

Rosati, F., & Faria, L.G.D. (2019b) Business contribution to the Sustainable Development Agenda: Organizational factors related to early adoption of SDG reporting, *Corporate Social Responsibility and Environmental Management*, vol. 26, no. 3: 588-597, https://doi.org/10.1002/csr.1705

Rusu, V.D., & Roman, A. (2018) An empirical analysis of factors affecting competitiveness of C.E.E. countries, *Economic Research-Ekonomska Istraživanja*, vol. 31, no. 1: 2044-2059, https://doi.org/10.1080/1331677X.2018.1480969

Scheyvens, R., Banks, G., & Hughes, E. (2016). The Private Sector and the SDGs: The Need to Move Beyond 'Business as Usual': The Private Sector and the SDGs: Moving Beyond 'Business-as-Usual', *Sustainable Development*, vol. 24, no .6: 371-382, https://doi.org/10.1002/sd.1623

van der Waal, J.W.H., & Thijssens, T. (2020) Corporate involvement in Sustainable Development Goals: Exploring the territory, *Journal of Cleaner Production*, vol. 252: 119625, https://doi.org/10.1016/j.jclepro.2019.119625

ESG Research Within the Realm of Sustainability: A Bibliometric Analysis Using Web of Science Database

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Abstract: **Motivation:** *The relationship between ESG factors and sustainability is a widely debated topic in the literature, but to our knowledge, there is a gap concerning the investigation of links between groups formed with ESG and other sustainability concepts, such as corporate social responsibility (CSR), green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0.* **Idea**: *The objective of this study is to identify the interest of researchers, their visibility, as well as the trends among publications, regarding the ESG factors in relation to other concepts within the realm of sustainability, like CSR, green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0.* **Data:** *The selected sample for the research includes 1,430 papers screened from the Web of Science database.* **Tools:** *The aim of this study is achieved by conducting a bibliometric analysis, using VOS viewer and PowerBI.* **Findings:** *The findings of this study include the interconnectivity of selected concepts, the number of publications over time, the paper types, the publishing activity by country, as well as the collaboration patterns between countries, the publishing activity by journal, the most productive authors, the co-authorship, the length, references, and citations trends, the most cited papers, and the co-occurrence of authors' keywords.* **Contribution:** *This analysis supports the identification of potential gaps in the current ESG-related research and point toward new areas of investigation. It also contributes to the advancement of ESG research, and to the achievement of sustainable development goals.*

Keywords: ESG, sustainability, CSR, industry 5.0, bibliometric analysis.

1. Introduction

Over recent decades, concern has grown about the issue of climate change, which is becoming more pressing (Duan, 2023). The United Nations formulated 17 sustainable development goals (SDGs) (Hamdy *et al.*, 2018), specifically addressing climate change, environmental degradation, and social inequality (Lee *et al.*, 2022). Within the context presented, it is crucial to assess the sustainability and social responsibility of business and one approach to this evaluation is through the application of ESG scores (Clement *et al.*, 2022).

Despite the numerous bibliometric analysis papers published on ESG topic, such as Zhao *et al.* (2023), Steblianskaia *et al.* (2023), Khan (2022), Senadheera *et al.* (2022), and Gao *et al.* (2021), according to our knowledge, there is a gap concerning the investigation of links between groups formed with ESG and other sustainability concepts, like CSR, green economy, circular economy, digitalization, technology,

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industry 4.0, and industry 5.0. Identifying new patterns in publications and journal performance, collaboration patterns, and investigating the intellectual structure of the presented topic in the existing literature are some of the primary reasons to undertake a bibliometric analysis (Donthu *et al.*, 2021).

Advancing the relevance of conducting a bibliometric analysis, the objective of this paper is focused on the ESG factors in relation to other concepts within the realm of sustainability, such as CSR, green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0. To achieve this aim, 1,430 papers were selected from the Web of Science database, which is a worldwide recognized database, covering many journals and international conferences (Lungu *et al.*, 2020). The applied methodology is divided into four steps, as presented by Donthu *et al.* (2021).

The results and the key characteristics in the selected area of research are highlighted through various analyses of the dataset, using descriptive and frequency analysis, and two software tools for visual representation – VOS viewer and PowerBI. Therefore, the findings include the interconnectivity of selected concepts, the number of publications over time, as well as the paper types, the publishing activity by country and the collaboration patterns between countries, the publishing activity by journal, the most productive authors, and the co-authorship, the length, references, and citations trends, the most cited papers, and the co-occurrence of authors' keywords. These analyses provide insights into the characteristics of the research landscape related to the chosen topic and help to identify the key trends and patterns. It also supports the identification of potential gaps in the current ESG-related studies and points toward new areas of investigation. Moreover, it contributes to the advancement of ESG research and to the achievement of sustainable development goals.

This paper is organized as follows: Section 2 includes an overview of the ESG factors in relation to other concepts within the realm of sustainability, such as CSR, green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0. In Section 3, the key methodological steps of the bibliometric analysis are described. Section 4 highlights the research findings, while the conclusions of this study are covered in Section 5.

2. Literature review

Earth is currently confronting unprecedented social and climate difficulties, and the science behind climate change is becoming increasingly alarmist (Clement *et al.*, 2022). In the context of sustainability, companies define strategies with the aim of creating value in the short, medium, and long term. Thus, the role of companies is not limited to profit-making only. Consequently, the attention shifts from shareholders to all stakeholders, and from financial reporting to the inclusion of non-financial information in corporate reporting (Caraiani *et al.*, 2015).

It was necessary for academics, managers, and investors to have a system for classifying companies as socially responsible organizations based on a variety of criteria. Given the difficulty of measuring social and environmental challenges, ESG scores are one approach that is frequently employed (Clement *et al.*, 2022). Although the development of ESG scores may seem like a superficial step, it is one of the critical reforms in shaping sustainable business environments (Khan, 2022). Senadheera *et al.* (2022)

argue that organizations with better ESG performance are more likely to be sustainable in relation to their own objectives and strategies. Moreover, investors and other stakeholders have begun to pay much greater attention to ESG scores. Unlike Senadheera *et al.* (2022), who refer to the absolute values of ESG scores, Uyar *et al.* (2022) argue that not only these values should be analyzed, but also the variations of the indicators, as inconsistency may harm organizations, even if the scores are high. On the other hand, Abrudan *et al.* (2021) indirectly support an inversely proportional relationship between companies with high ESG scores and investor interest. To facilitate the understanding of the actions behind this analysis, Galucci *et al.* (2022) advocate for the need to increase transparency levels in the methodology of calculating the indicators.

In a sustainable environment, CSR typically refers to a firm's commitment to contribute to societal, economic, and environmental well-being through business practices and activities, which may enhance firms' reputation and brand, create consumer loyalty, and achieve better financial performance (Chen *et al.*, 2023). Business models that encourage decentralization and the development of circular value in goods and services make sustainability and CSR possible (Upadhyay *et al.*, 2021). The circular economy is a framework for business models that, in order to achieve sustainable development, which includes improving the environment and promoting social equity, replace the idea of e*nd-of-life* with reducing, reusing, recycling, and recovering resources in production and distribution processes (Figge *et al.*, 2022).

The green economy, highlighted as an important pillar in economic and environmental development (Lee *et al.*, 2022), is analyzed from three perspectives: conceptual, implementation, and quantification of its implementation results. The conceptual perspective is defined in formulating strategies, creating policies, and elaborating development programs. From the implementation perspective, the green economy includes elements such as sustainable products and services, sustainable management, and sustainable jobs. In the third perspective, the United Nations Environment Programme has established three sets of indicators: environmental (climate change, natural resources, waste), policy (investment, fiscal reforms, ecosystems, educational programs), and social (jobs, access to resources, welfare, health) (Adamowicz, 2022). By enabling more effective resource usage (e.g., optimizing energy consumption), decreasing waste, and lowering emissions, digitalization may play a critical role in accomplishing sustainability goals. Better living conditions, active public participation, ethical governance, and transparency in public welfare programs and processes are all benefits of digitalization (Xu *et al.*, 2021).

Innovative technologies are used in sustainable business models to increase resource efficiency, reduce environmental effects across the product life cycle, preserve energy, cut emissions, optimize industrial structures, and spread the sustainability of business processes (Upadhyay *et al.*, 2021). They also enable companies to anticipate future customer behaviors, by using past or current behavioral patterns as the foundation for their strategic decisions (Anica-Popa *et al.*, 2021). Given the current importance of human-centeredness, resilience, and sustainability, the emerging technologies created under I4.0 are intended to better satisfy industrial and technological goals without compromising socio-economic and environmental performance, which has led to the emergence of I5.0 (Xu *et al.*, 2021). Various innovative technologies, which reshape business models, are highlighted by researchers, including artificial intelligence, blockchain, the Internet of Things, digital voice assistants, business intelligence, and virtual reality (Cavalcanti *et al.*, 2022; Upadhyay *et al.*, 2021; Chen and Bellavitis, 2020).

3. Methodology

The aim of this study is achieved by conducting a bibliometric analysis, which includes a performance identification that assesses the productivity and the impact of various research elements, such as paper types, countries, authors, citations, journals, and keywords. In addition to these traditional bibliometric analysis techniques, this study also utilizes advanced enhancement techniques, such as visualization. Donthu *et al.* (2021) present four steps that must be followed to conduct a bibliometric analysis: *(1)* defining the aims and scope, *(2)* choosing the techniques, *(3)* collecting the data from a bibliometric database and *(4)* conducting the bibliometric analysis and reporting the findings.

Step 1: Defining the aims and scope of the bibliometric study. The objective of this study is to identify the interest of researchers, their visibility, as well as the trends among publications, regarding the ESG factors in relation to other concepts within the realm of sustainability. These concepts are CSR, green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0. The characteristics of ESG-related research, such as length, citation, references, and the number of authors were also assessed. Additionally, the analysis examines the collaboration patterns among authors, institutions, and it also identifies potential opportunities for future work in ESG-related areas. Moreover, this paper contributes to the advancement of ESG research by providing valuable insights into the literature landscape of this field.

Step 2: Choosing the techniques for the bibliometric analysis. The study employs various techniques, including performance analysis and science mapping, such as citation analysis, co-citation analysis, co-word analysis, and co-authorship analysis. The performance analysis assesses the productivity and impacts the publications in the ESG research field. The science mapping techniques enable the identification of the most productive authors and journals. Moreover, the citation, co-citation, co-word, and co-authorship analyses facilitate the exploration of the interrelationships and connections among publications and researchers focused on ESG topics. These techniques are widely utilized in bibliometric studies and have demonstrated effectiveness in providing valuable insights into the research trends and performance of the ESG research field (Jain and Tripathi, 2023; Khan, 2022).

Step 3: Collecting the data for bibliometric analysis. The third step is to collect the data needed for the bibliometric analysis techniques selected in the second step (Donthu *et al.*, 2021). Thereby, the search terms were defined in a way that relates to the broad and general themes of the analyzed concepts, but at the same time focused enough to stay within the research area defined in the first step (Lungu *et al.*, 2020). The chosen search terms are ESG, sustainability, CSR, green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0. The Web of Science searches were generated by combining selected terms as follows: ESG and Sustainability, ESG and CSR, ESG and Green economy, ESG and Circular economy, ESG and Digitalization, ESG and Technology, ESG and Industry 4.0, and ESG and Industry 5.0. (Alsmadi and Alzoubi, 2022; Ellili, 2022; He *et al.*, 2022). These chosen combinations of words allow to determine any paper that addressed the studied associations.

Data is collected from the Web of Science Core Collection bibliographic and bibliometric database. Web of Science is a platform that brings together diverse and specialized information, enabling users to monitor the evolution of concepts across various disciplines. Clarivate Analytics manages this database, which includes many esteemed journals and conferences subject to rigorous international and national peer review (Lungu *et al.*, 2020). No specific time frame was set as the intention is to observe the complete evolution of the research area over time, thereby facilitating the formulation of comprehensive conclusions.

Table 1 presents all the steps that were followed in the process of data cleaning, with the aim that the final sample consists only of papers relevant to the research objective.

Table 1. **Breakdown analysis of the applied exclusion criteria**

Applied criteria	**Number of papers**
1. Initial search	**2,611**
2. Duplicates exclusion	
Duplicates	(491)
Distinct papers – taken into consideration	2,120
3. Papers language	**2.120**
Non-English papers	(22)
English papers – taken into consideration	2,098
4. Research Area	**2,098**
Total research areas	*226*
Research areas not taken into consideration	*97*
Papers not taken into consideration	(223)
Research areas taken into consideration	*129*
Papers taken into consideration	1,875
5. Abstract availability	**1,875**
Available abstract in WoS – papers taken into consideration	1,834
Unavailable abstract in WoS	41
Abstracts not found on Google	(27)
Abstracts found on Google – papers taken into consideration	14
6. Abstract analysis	**1,848**
ESG available in abstract – papers taken into consideration	1,244
ESG not available in abstract	604
*Environmen*t or *social* or *governance* not available in abstract	(309)
Environment or *social* or *governance* available in abstract - papers *taken* into consideration	295
7. Abstract reading	**1,539**
Papers not taken into consideration	(109)
Papers taken into consideration	1,430
FINAL SAMPLE	**1,430**

The initial search generated 2,611 papers. To ensure the relevance to the research theme, an Excel file was created to record all available information about these papers. Following the removal of duplicates, 491 articles were deleted due to overlapping concepts of sustainability. In addition, a language filter was applied to include only articles published in English, leading to the removal of 22 non-English papers. The next step involved analyzing the research fields of the selected papers, which were found to belong to 226 distinct research areas. To focus the analysis on the relevant fields, 223 papers from 97 research areas, such as architecture, chemistry, criminology, construction, geography, medicine, and physics were excluded, resulting in a final sample of 1,875 papers.

The next investigation focused on the abstracts of publications to ensure the relevance of the sample. Of the initial 1,875 papers, 41 lacked abstracts in Web of Science and were manually searched for on the Internet. Out of these, abstracts for 14 papers were retrieved, while the remaining 27 could not be identified. Thus, 1,848 papers remained in the sample and a criterion was set in Excel - the abstracts must include the term *ESG*, to further clean the data before reading the abstracts. *ESG* was present in 1,244 of the 1,848 papers, while the remaining 604 papers lacked this term. Another condition was then applied to the 604 papers, requiring that they include at least one of the following terms: *environment*, *social*, or *governance*. Among these papers, 309 did not meet this criterion and were removed, leaving a total of 1,539 papers that required abstract reading. This included 1,244 papers that referred to *ESG* and 295 papers that mentioned at least one of the terms: *environment*, *social*, or *governance*.

Following a review of the abstracts, 109 papers were disregarded because they were not relevant to the topic. For instance, even though they mentioned *ESG* in the abstract, it stood for various different concepts, such as Earth System Grid (ESG), electrostatic gyroscopes (ESG), Expeditionary Strike Group (ESG), early sudden gains (ESG), early seedling growth (ESG) etc.

Step 4: Conducting the bibliometric analysis and reporting the findings. The results and the key characteristics in the selected area summarize the performance of research constituents, such as authors, countries, and journals, using the total number of publications, citations, and references. Moreover, different techniques for science mapping are used, such as citation analysis, co-authorship analysis, and co-word analysis. Enhancement methods, like clustering and visualization are explored by using Microsoft Excel, VOS viewer, and PowerBI.

4. Results and discussion

4.1. Analysis based on the interconnectivity of concepts

As previously mentioned, the Web of Science database was used to conduct a search for relevant literature. The total number of papers obtained by employing the prescribed keyword combinations is presented in *Table 2*, which amounted to 2,611.

Table 2. **The steps followed for the interconnectivity analysis**

Steps	**Number of papers / instances**
Papers initially selected	2,611
Papers taken into consideration (duplicates included)	**1,871**
Papers that appeared at least twice	394
Total instances of the papers that appeared at least twice	833
Eliminated papers that were duplicates	**(441)**
Final sample	**1,430**

The methodology used involved the steps described in the methodology section, to identify articles relevant to the research objective, resulting in a reduction in the number of papers to 1,430. Given the interconnected nature of the analyzed concepts, 394 articles were found to be duplicated, with an average recurrence of 2.11 times, generating 833 instances. After eliminating the duplicates, the final sample was composed of 1,430 articles. Moreover, to analyze the interconnectivity of these concepts in the specialized literature, an examination was carried out on the duplicate articles, and the results were used to create *Figure 1*, which illustrates the graphic representation of the interconnection of the analyzed concepts.

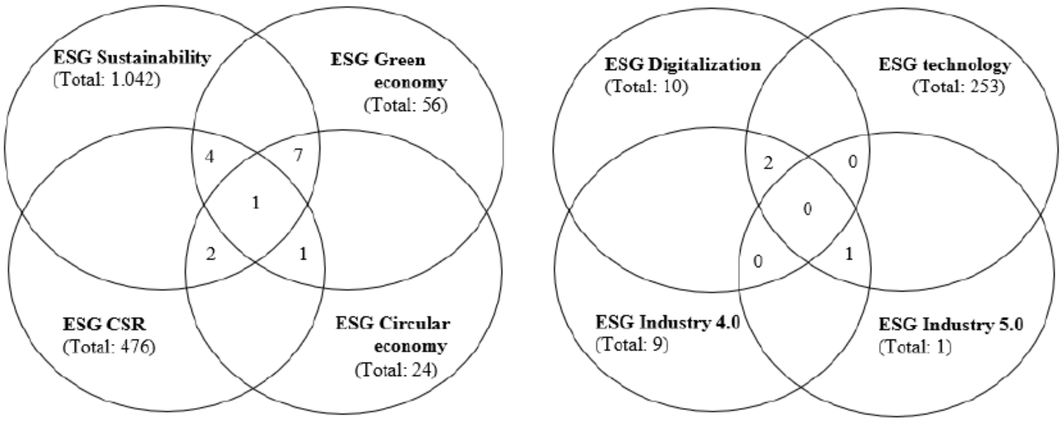

Figure 1. **Graphical representation of the analyzed concepts' interconnectivity**

Initially, the word combinations were segregated into two groups: (1) ESG and Sustainability, ESG and Green economy, ESG and Circular economy, and ESG and CSR, and (2) ESG and Digitalization, ESG and Technology, ESG and Industry 5.0, and ESG and Industry 4.0. Regarding the first group, it is noteworthy that out of the total number of articles, only one addresses all the selected concepts simultaneously. Four articles analyze the connection between ESG and Sustainability, ESG and Green economy, and ESG and CSR; seven articles examine the concepts of ESG and Sustainability, ESG and Green economy, and ESG and Circular economy; two articles investigate the concepts of ESG and Sustainability, ESG and Circular economy, and ESG and CSR, while one article examines the concepts of ESG and Green economy, ESG and Circular economy, and ESG and CSR. Concerning the second group, none of the articles deal with all the concepts simultaneously; two articles cover the concepts of ESG and Digitalization, ESG and Technology, and ESG and Industry 4.0, one article addresses ESG and Technology, ESG and Industry 5.0, and ESG and Industry 4.0, while none of the articles cover the concepts of ESG and Digitalization, ESG and Industry 5.0, ESG and Industry 4.0, or ESG and Digitalization, ESG and Technology, and ESG and Industry 5.0 at the same time.

4.2. Analysis based on the number of publications

Scholars have only recently begun to investigate the ESG criteria as data-driven aspects of sustainability due to its relatively new terminology, which was first introduced in the United Nations *Who Cares Wins* report in 2004 (Senadheera *et al.*, 2022). *Figure 2* presents a graphic illustration of the evolution of the number of papers published in the ESG sphere in relation to the selected concepts.

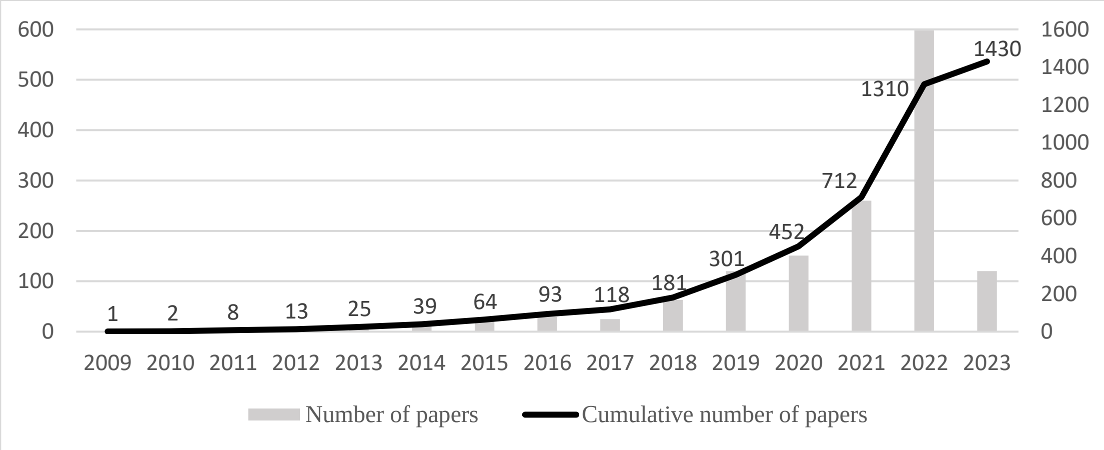

Figure 2. **Yearly and cumulative number of identified papers**

The first study that met the search and exclusion criteria described in the methodology is Kocmanova and Nemecek (2009), which explores the evaluation of a company's performance by measuring the integration of economic, environmental, and social issues, and corporate governance. Although the trend has been consistently increasing since the publication of the first paper, it may be observed that starting from 2020, the number of such papers has almost doubled annually. This highlights a growing interest among academics in analyzing ESG factors in relation to other concepts within the realm of sustainability. The peak was reached in 2022, most likely because of the Covid-19 pandemic, which has grown the attention to the importance of environmental, social and governance factors in the corporate world. As a result, there has been an increased interest in ESG research, as investors seek to align their portfolios with companies that prioritize sustainability (Vineis and Mangone, 2022).

4.3. Analysis based on papers type

The following analysis is based on the number of published papers according to their type: article, book chapter, editorial material, letter, proceedings paper, and review, as presented in *Table 3*.

Table 3. **The distribution of papers per type and publication year**

Year	Paper type							
	Article	Book Chapter	Edit. Material	Letter	Proceed. Paper	Review	Total	
2009					1		1	0.07%
2010	1						1	0.07%
2011	3	1			2		6	0.42%
2012	2	1			2		5	0.35%
2013	3	8			1		12	0.84%
2014	6	3	1		2	2	14	0.98%
2015	16	1	1		5	2	25	1.75%
2016	22	1			6		29	2.03%
2017	21	1			3		25	1.75%
2018	48	7	1		5	2	63	4.41%
2019	98	1	1		17	3	120	8.39%
2020	135	1	1		7	7	151	10.56 %

Year	Paper type							
	Article	**Book Chapter**	**Edit. Material**	**Letter**	**Proceed. Paper**	**Review**	**Total**	
2021	235	2	1		9	13	260	18.18%
2022	552		8	1	15	22	598	41.82%
2023	104		1		1	14	120	8.39%
Total	1,246	27	15	1	76	65	1,430	100%
	87.13%	**1.89%**	**1.05%**	**0.07%**	**5.31%**	**4.55%**	**100%**	

The selection or exclusion of papers from the final sample was not performed upon the type of paper, and therefore, these categories were not deliberately chosen. Consequently, the available papers within the Web of Science database that conform to the research methodology have been delimited by these categories. The category with the highest number of publications is *Article*, which accounts for 87.13% of the total. The following categories, *Proceedings Paper* and *Review*, have considerably smaller shares, collectively representing nearly 10% of the total number of papers. The analysis of articles reveals a threefold increase in their number in 2022 compared to the previous year. This trend indicates a significantly heightened interest among academics and journals in this area.

4.4. Analysis of the publishing activity by country and continent

The use of ESG indicators has generated significant scholarly interest, with authors affiliated with institutions in 87 countries worldwide contributing to this area of research. *Figure 3* illustrates the distribution of papers considering the country of institutions that authors are affiliated with, using the PowerBI software.

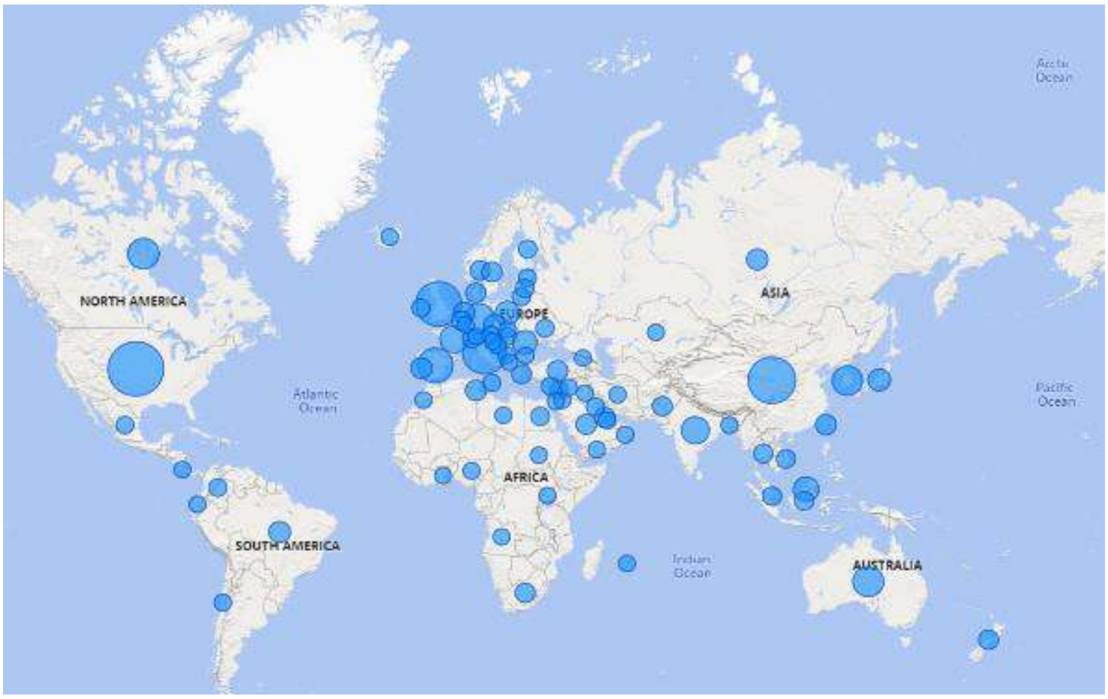

Figure 3. **PowerBI map of publishing countries**

The selected topic is one that is of global interest and most publications come from Europe (65.24%). This is followed by Asia (42.17%), North America (20.84%), Oceania (6.57%), Africa (4.34%), and South America (2.87%). Next, *Table 4* displays the 15 top countries regarding the number of published papers. The United States of America occupies the first position with 212 articles, constituting 14.83% of the total. Following the US, China, and the United Kingdom rank second and third with 168 (11.75%) and 159 (11.12%) articles, respectively. Notably, Romania is positioned 13th in the ranking with 43 articles, which represents 3.01% of the total papers identified in the Web of Science database.

Table 4. **Top 15 publishing countries on ESG**

Countries	**Number of papers**	**Frequency**
USA	212	14.83%
China	168	11.75%
United Kingdom	159	11.12%
Italy	150	10.49%
Spain	103	7.20%
Canada	79	5.52%
Australia	77	5.38%
Germany	73	5.10%
South Korea	73	5.10%
France	64	4.48%
India	58	4.06%
Malaysia	48	3.36%
Romania	43	3.01%
Poland	42	2.94%
Japan	32	2.24%
Total	**1,381**	**96.58%**

Moreover, *Figure 4* presents an overview of the co-authorship across different nations. The graphical representation facilitates the detection of collaborative efforts among various countries.

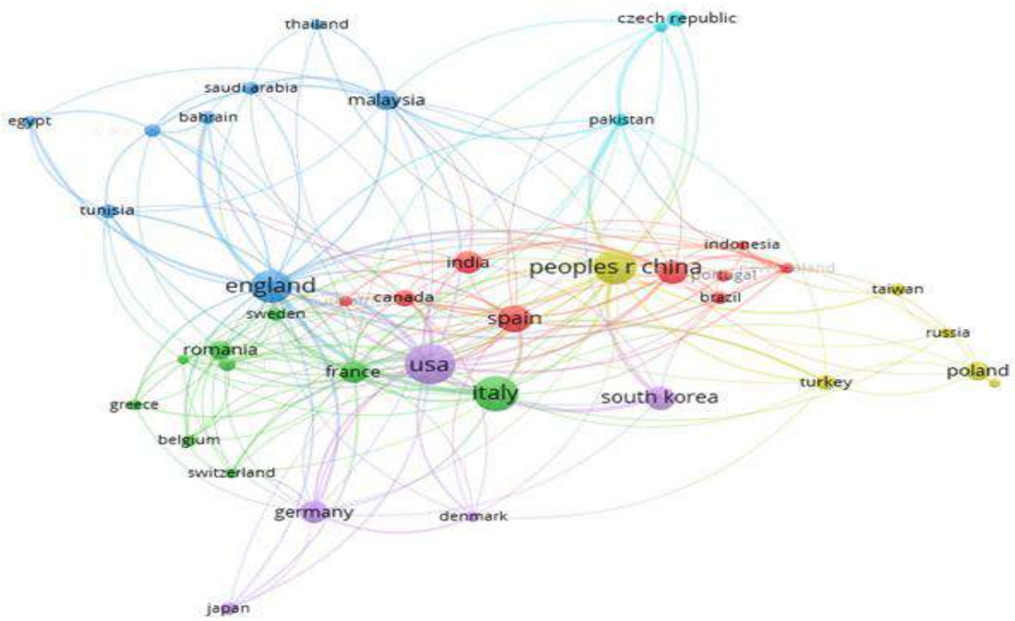

Figure 4. **Network analysis of co-authorship based on countries**

Through a VOS viewer analysis, five distinct clusters are highlighted. The findings suggest that, regarding the ESG research, the United States tends to collaborate with Germany and South Korea, Italy with France, and Romania, China with Poland, Russia, Turkey, and Taiwan, the United Kingdom with Malaysia, Tunisia, Bahrain, and Tunisia, while Spain collaborates with India, and Canada.

4.5. Analysis of the publishing activity by journals

A total of 1,430 papers were identified across 457 publications. *Table 5* presents the journals with the highest number of articles on the topic of ESG.

Table 5. **Ten most prominent journals**

Journal	Number of articles	Frequency	Impact factor 2021
Sustainability	277	19.37%	3.889
Business Strategy and the Environment	51	3.57%	10.801
Corporate Social Responsibility and Environmental Management	51	3.57%	8.464
Journal of Cleaner Production	39	2.73%	11.072
Journal of Sustainable Finance & Investment	36	2.52%	3.65
Frontiers in Environmental Science	26	1.82%	5.411
Finance Research Letters	24	1.68%	9.846
Journal of Business Ethics	24	1.68%	6.331
Sustainability Accounting Management and Policy Journal	19	1.33%	3.964
Energies	18	1.26%	3.252
Total	**565**	**39.53%**	

The most prominent journals in this field include *Sustainability* (277 papers), *Business Strategy and the Environment* (51 papers), and *Corporate Social Responsibility and Environmental Management* (51 papers). It is evident that a substantial difference exists between the highest-performing journal, which comprises almost 20% of the total analyzed papers, and the other journals that are included in this top. Furthermore, the *Journal of Cleaner Production* boasts the highest impact factor (11.072), followed by *Business Strategy and the Environment* (10.801) and *Finance Research Letters* (9.846). While *Sustainability* has published the greatest number of papers, its impact factor is significantly lower (3.889).

4.6. Analysis of the top 10 most productive authors and co-authorship

According to the analysis, it was revealed that among the total of 3,429 authors, 440 had two or more publications. *Table 6* presents the top 10 of the most productive authors. Amina Buallay, who holds affiliations with a university in the United Kingdom and one in Bahrain, has emerged as the most preeminent author in the field, having published a total of 17 papers. Following Buallay, Alena Kocmanova has released 8 papers. The analysis of the authors with the highest publication output has also highlighted that Europe is the principal region where research on ESG-related matters is being conducted.

Table 6. **Top 10 most productive authors**

Author	Papers	First author papers	Single authored papers	Corresp. Author papers	Author affiliation	Country
Buallay Amina	17	15	6	15	Brunel University and Ahlia/ University Bahrain	United Kingdom/ Bahrain
Kocmanova Alena	8	7	0	7	Brno University of Technology	Czech Republic
Eccles Robert	7	3	0	2	University of Oxford	United Kingdom
Escrig-Olmedo Elena	7	3	0	4	Universitat Jaume I	Spain
Faldik Oldrich	7	0	0	0	Mendel University in Brno	Czech Republic
Hamdan Allam	7	0	0	0	Ahlia University Bahrain	Bahrain
Hussainey Khaled	7	0	0	0	University of Portsmouth	United Kingdom
Trenz Oldrich	7	4	0	4	Mendel University in Brno	Czech Republic
Uyar Ali	7	4	0	5	La Rochelle Business School	France
Serafeim George	6	1	0	1	University of Genoa	Italy

Furthermore, *Figure 6* presents an overview of the collaborations between authors. In order to create this figure, a condition was set - the authors must have at least 2 published papers.

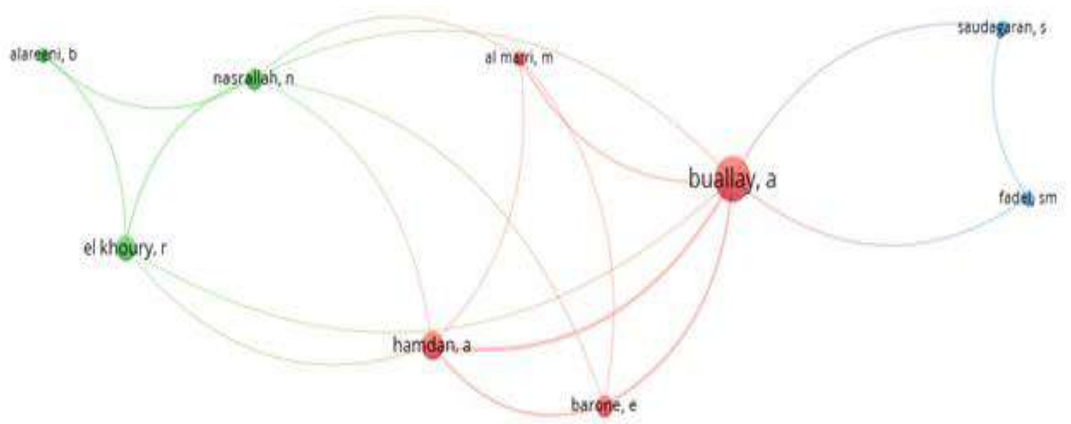

Figure 6. **Visual representation of co-authorship**

Buallay Amina is not only the author with the highest productivity, but she also has the highest degree of involvement in collaborative efforts. This outcome was anticipated, given that *Table 6* reveals that out of a total of 17 publications, Buallay Amina is a single-author for 6 papers, while the remaining 11 papers involve collaborations with other authors.

4.7. Analysis of length, references, and citations trends

To evaluate the length and quality of the papers, the number of pages, as well as the number of references and citations extracted from the WoS analytics database for each paper were taken into consideration. The resultant data is displayed in *Table 7*. The cumulative length of the selected papers amounts to 26,759 pages, with an average number of 18.71 pages per paper.

Table 7. **Number of pages, references, and citations**

Aspects	Descriptive statistics
Total number of pages	**26,759**
Average pages per paper	18.71
Min of pages of one paper	2
Max of pages of one paper	80
Total number of references	**98,706**
Average number of references per paper	69.03
Min of references of one paper	0
Max of references of one paper	392
Total number of citations	**19,763**
Average number of citations per paper	13.82
Min of citations of one paper	0
Max of citations of one paper	1,220

The descriptive statistics indicate that the shortest article has 2 pages (there are 2 articles of 2 pages published in 2009 and 2022). The most extensive paper, comprising 80 pages, was published in 2019 in the *University of Pennsylvania Journal of International Law*.

Upon conducting an examination of the number of references used in the papers, 98,706 references were identified across 1,430 publications, resulting in an average of 69.03 references per research. Notably, six articles did not include any references. Of the six, two were written by a single author, two were co-authored by two authors, one was co-authored by three authors, and the last one was co-authored by four authors. Likewise, the paper authored by Christensen *et al.* (2021), having 73 pages, had the highest number of references, totaling 392.

Among the 1,430 articles that were analyzed, which altogether had a citation count of 19,763, it was observed that the top 10 most frequently cited articles contribute to 3,067 citations. More details are provided in *Table 8*. The article *Corporate Social Responsibility and Access to Finance* authored by Cheng *et al.* (2014) has the highest number of citations among the selected literature, signifying its importance in the field. Given the fact that it was published in 2014, it was anticipated to have a substantial total citation count, which was indeed observed. It also stands out for having the highest average annual citation count, underscoring its significant influence on the field of study.

Table 8. **Top 10 most cited papers**

No.	Title	Authors	Publication Year	No. of citations	Average citations per year
1	Corporate Social Responsibility and Access to Finance	Cheng *et al.*	2014	1,220	152.50
2	ESG performance and firm value: The moderating role of disclosure	Fatemi *et al.*	2018	245	61.25
3	The effects of environmental, social and governance disclosures and performance on firm value: A review of the literature in accounting and finance	Brooks and Oikonomou	2018	222	55.50
4	Corporate social responsibility and financial performance: A non-linear and disaggregated approach	Nollet *et al.*	2016	216	36.00
5	Corporate social responsibility governance, outcomes, and financial performance	Wang and Sarkis	2017	203	40.60
6	Diversity of Board of Directors and Environmental Social Governance: Evidence from Italian Listed Companies	Cucari *et al.*	2018	201	50.25
7	Sensitive industries produce better ESG performance: Evidence from emerging markets	Garcia *et al.*	2017	198	39.60
8	Do environmental, social, and governance activities improve corporate financial performance?	Xie *et al.*	2019	193	64.33
9	The informational contribution of social and environmental disclosures for investors	Cormier *et al.*	2011	192	17.45
10	Firms and social responsibility: A review of ESG and CSR research in corporate finance	Gillan *et al.*	2021	177	88.50

4.8. Analysis of authors' keywords

To visualize the most used author keywords, a co-occurrence analysis was conducted in VOS viewer, which is shown in *Figure 6*. According to VOS viewer, the three major co-occurrences are around the concepts of ESG (368 occurrences) and sustainability (184 occurrences) in yellow, and CSR (304 occurrences) in red. To obtain a clearer overview, it was applied a minimum threshold of 25 occurrences for the displayed keywords.

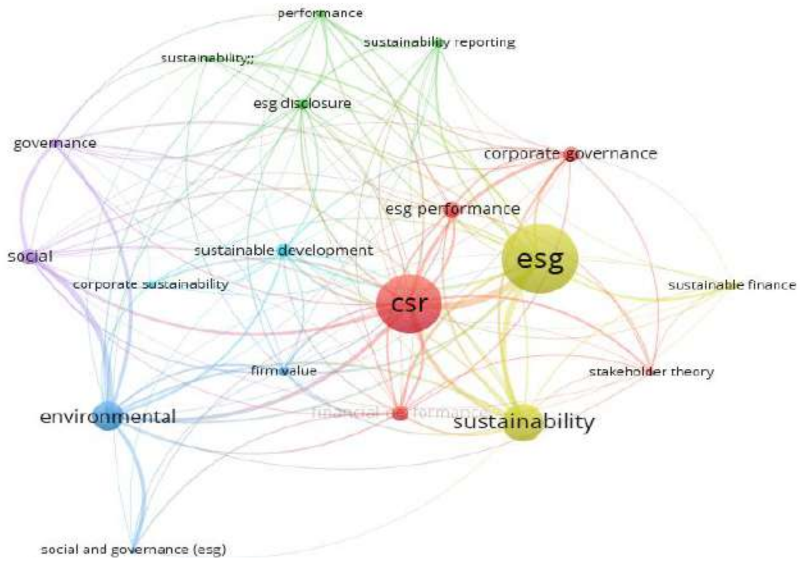

Figure 6. **Co-occurrence analysis of author keywords**

5. Conclusion

This paper provides an overview of the state of research in the field of ESG factors in relation to other concepts within the realm of sustainability, such as CSR, green economy, circular economy, digitalization, technology, industry 4.0, and industry 5.0. Using a bibliometric analysis, this study explores the available papers that are indexed in Web of Science database. While the initial search generated 2.611 results, after the elimination of duplicates and the application of the exclusion criteria described in the methodology, a number of 1.430 papers were included in the analysis.

The results and the key characteristics in the selected area of research are highlighted through various analyses of the final sample, using descriptive and frequency analysis, and two software tools for visual representation – VOS viewer and PowerBI. Therefore, the findings include the interconnectivity of selected concepts, the number of publications over time, as well as the paper types, the publishing activity by country and the collaboration patterns between countries, the publishing activity by journal, the most productive authors, and the co-authorship, the length, references, and citations trends, the most cited papers, and the co-occurrence of authors' keywords.

Among the identified results, it is noteworthy that a single article analyzes simultaneously the concepts of ESG and Sustainability, ESG and CSR, ESG and Green economy, ESG and Circular economy, while no article simultaneously treats the concepts ESG and Digitalization, ESG and Technology, ESG and Industry 4.0, and ESG and Industry 5.0. It is also worth noting that a number of 273, i.e. 19.09% of the articles, contain studies on ESG in correlation with concepts from the technical area under consideration: digitization, technology, industry 4.0 and industry 5.0. The peak in terms of publications was reached in 2022, when 41.82% of all papers identified in Web of Science as pertinent to the research topic were authored. The three most productive nations in the chosen field are the USA, China, and the UK. The analysis also reveals that each country forms a distinct cluster when it comes to the authors' cooperation, having collaboration between these three countries being avoided. *Sustainability*, *Business Strategy and the Environment*, and *Corporate Social*

Responsibility and Environmental Management stand out as the top three most prolific publications. Amina Buallay, who is affiliated with both a university in Bahrain and one in the United Kingdom, is the most productive author. She is also the author of most collaborations. It is reported that the publications have, on average, 18.71 pages, 69.03 references, and 13.82 citations per work. The most cited article is *Corporate Social Responsibility and Access to Finance*, authored by Cheng *et al.* (2014), having 1,220 citations, with an average of 152.5 citations per year. The most often used keywords by the authors are ESG (368 occurrences), CSR (304 occurrences), and sustainability (184 occurrences). This analysis assists in the identification of potential gaps in the current ESG-related research and point to new topics of study.

In order to examine the interconnection between the chosen ideas, a meta-analysis of the publications mentioned in *Figure 1* might be a future research direction. The potential future paper could analyze the similarities and differences between the two studied groups of the concepts within the realm of sustainability (1) CSR, Green economy, Circular economy and (2) Digitalization, Technology, Industry 4.0, and Industry 5.0. Examining the general trends in the economic environment, it is also very likely that there will be an increase in the number of researches aimed at capitalizing on disruptive technologies in achieving ESG objectives.

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References

Abrudan, L.C., Matei, M.C., Abrudan, M.M. (2021) “Towards Sustainable Finance: Conceptualizing Future Generations as Stakeholders”, *Sustainability,* vol. 13, no. 24: 13717

Adamowicz, M. (2022) “Green Deal, Green Growth and Green Economy as a Means of Support for Attaining the Sustainable Development Goals”, S*ustainability,* vol. 14, no. 1: 5901

Alsmadi, A.A. & Alzoubi, M. (2022) “Green Economy: Bibliometric Analysis Approach”, *International Journal of Energy Economics and Policy*, vol. 12, no. 2: 282-298

Anica-Popa, I., Anica-Popa, L., Rădulescu, C. & Vrînciantu, M. (2021) “The Integration of Artificial Intelligence in Retail: Benefits, Challenges and a Dedicated Conceptual Framework”, *Amfiteatru Economic,* vol. 23, no. 56: 120-136

Caraiani, C., Lungu, C.I., Dascălu, C. & Colceag, F. (2015) *Green Accounting Initiatives and Strategies for Sustainable Development*, Harshey: IGI Global

Cavalcanti, D.R., Oliveira, T. & Santini, F.O. (2022) „Drivers of digital transformation adoption: A weight and meta-analysis”, *Heliyon*, vol. 8, no. 2: 08911

Chen, Y. & Bellavitis, C. (2020) “Blockchain disruption and decentralized finance: The rise of decentralized business models”, *Journal of Business Venturing Insights*”, vol. 13, no. C

Chen, W., Zhu, Y. & Wang, C. (2023) “Executives' overseas background and corporate green innovation”, *Corporate Social Responsibility and Environmental Management*, vol. 30, no. 1: 165-179

Clement, A., Robinot, E. & Trespeuch, L. (2022) “Improving ESG Scores with Sustainability Concepts”, *Sustainability,* vol. 14, no. 20: 175-180

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N. & Lim, W.M. (2021) “How to conduct a bibliometric analysis: An overview and guidelines”, *Journal of Business Research*, vol. 133: 285-296

Duan, L. (2023) “ESG Index Construction and China's ESG System”, *BCP Business & Management*, vol. 38: 175-180

Ellili, N.O.D. (2022) “Is there any association between FinTech and sustainability? Evidence from bibliometric review and content analysis”, *Journal of Financial Services Marketing*, Dec21: 1-15

Figge, F., Stevenson Thorpe, A., Manzhynski, S. (2022) “Value creation and the circular economy: A tale of three externalities”, *Journal of Industrial Ecology*, vol. 25, no. 5: 1690-1700

Gallucci, C., Santulli, R. & Lagasio, V. (2022) “The conceptualization of environmental, social and governance risks in portfolio studies A systematic literature review”, *Socio-Economic Planning Sciences*, vol. 84, no. 3, 101382

Gao, S., Meng, F.C., Gu, Z.Y., Liu, Z.Y., Farrukh, M. (2021) “Mapping and Clustering Analysis on Environmental, Social and Governance Field a Bibliometric Analysis Using Scopus”, *Sustainability*, vol. 13, no. 13, 7304

Hamdy, O.M.M, Elsayed, K.K. & Elahmady, B. (2018) “Impact of Sustainable Supply Chain Management Practices on Egyptian Companies' Performance”, *European Journal of Sustainable Development*, vol. 7, no. 4: 119-130

He, M., Yu, W. & Han, X. (2022) “Bibliometric Review on Corporate Social Responsibility of the Food Industry”, *Journal of Food Quality*, vol. 2022, no. 12: 1-14

Jain, K. & Tripathi, P. S. (2023) “Mapping the environmental, social and governance literature: a bibliometric and content analysis”, *Journal of Strategy and Management*

Khan, M.A. (2022) “ESG disclosure and Firm performance: A bibliometric and meta-analysis”, *Research in International Business and Finance*, vol. 61, no. 4: 101668

Lee, C.-C., Wang, C.-W. & Ho, S.-J. (2022) “The dimension of green economy: Culture viewpoint”, *Economic Analysis and Policy*, vol. 74: 122-138

Lungu, C.I., Pompei, M., Caraiani, C. & Constantinescu, D. (2020) “A structured literature review of corporate governance and performance research within an emerging country setting”, *Journal of Accounting and Management Information Systems*, vol. 19, no. 4: 707-733

Senadheera, S.S., Gregory, R., Rinklebe, J., Farrukh, M., Rhee, J.H. & Ok, Y.S. (2022) “The development of research on environmental, social, and governance (ESG): A bibliometric analysis”, *Sustainable Environment*, vol. 8, no. 1: 2125869

Steblianskaia, E., Vasiev, M., Denisov, A., Bocharnikov, V., Steblyanskaya, A. & Wang, Q. (2023) “Environmental-social-governance concept bibliometric analysis and systematic literature review: Do investors becoming more environmentally conscious?”, *Environmental and Sustainability Indicators*, vol. 17: 100218

Upadhyay, A., Mukhuty, S., Kumar, V. & Kazancoglu, Y. (2021) “Blockchain technology and the circular economy: Implications for sustainability and social responsibility”, *Journal of Cleaner Production*, vol. 293: 126130

Uyar, A., Kuzey, C. & Karaman, A.S. (2022) “ESG performance and CSR awards: Does consistency matter?”, *Finance Research Letters*, vol. 50: 103276

Vineis, P. & Mangone, L. (2022) “The need for new metrics in the Anthropocene era”, *Frontiers In Public Health*, vol. 10: 2527

Xu, X., Lu, Y., Vogel-Heuser, B. & Wang, L. (2021) “Industry 4.0 and Industry 5.0 – Inception, conception and perception”, *Journal of Manufacturing Systems*, vol. 61: 530-535

Zhao, X.Y., Nan, D.Y., Chen, C.M., Zhang, S.A., Che, S.P. & Kim, J.H. (2023). “Bibliometric study on environmental, social, and governance research using CiteSpace”, *Frontiers in Environmental Science*, vol. 10, 2534

Does ESG Score Have an Impact on Corporate Profitability and Risk?

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Abstract: *The aim of this study is to analyze if ESG (Environmental, Social and Governance) scores can influence the firm performance and risk. In the current climate, ESG has become increasingly important for businesses and a company with good ESG credentials is one that considers very important the impact of its actions on the environment and society, alongside with good governance practices. Due to the increased interest to sustainability issues, companies are very focused on ESG factors as they can influence their key financial values. Our study shows that ESG combined score is positively and significantly associated with firm value and profitability. These findings can suggest that high ESG performance can be the key to financial return for the firm in terms of both value and profitability. Moreover, our main findings present that ESG combined score can also influence the credit ratings, so firms can invest in ESG to improve their financial risk.*

Keywords*:* *ESG, corporate profitability, credit ratings.*

1. Introduction

Given the present economic circumstances, it has become increasingly crucial for most organizations to prioritize sustainability. Companies now face a broader array of significant risks and opportunities that are intricately linked to climate change, global health crises, the need for transparent supply chains, and the escalating pollution levels resulting from industrialization in various countries. In response, markets, governments, non-governmental organizations (NGOs), local communities, and other stakeholders are demanding heightened transparency and accountability across the environmental, social, and governance (ESG) spectrum. This call for greater awareness aims to comprehensively grasp the genuine impact of business and industry on our environment and communities. The integration of ESG factors into investment decisions and business practices has gained significant traction.

Beyond ethical and responsible investing, there is growing evidence suggesting that companies that have shifted their focus to ESG factors and thus have a greater awareness of sustainability, are able to create new virtuous approaches to business. ESG issues have become a topic of interest also for shareholders, and governments as they reflect a risk management issue, while for companies they have become an integral part of competitive strategy, especially since the Covid-19 pandemic.

The regulatory landscape is also evolving to encourage ESG integration. Governments and regulatory bodies are implementing frameworks and guidelines that promote

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responsible business practices and require ESG disclosure. This regulatory push, combined with investor demand, is further incentivizing companies to improve their ESG performance and reporting. As the field of sustainable finance continues to develop, further research and analysis are needed to deepen our understanding of the relationship between ESG and financial performance. This includes examining specific industry contexts, regional variations, and the impact of different ESG factors on financial outcomes.

The present study continues with the literature review on the ESG factors that have an impact on corporate profitability and risk. This is followed by the research methodology section, presentation and discussion of the results. Finally, conclusions are drawn and suggestions for future implications and research are provided.

2. Literature review

Several studies document how ESG affects firm value and profitability. According to a meta-analysis conducted by Friede *et al.* (2015) stated, researchers began looking for a link between corporate financial success and ESG standards since the 1970s. After reviewing more than 2000 papers, the authors conclude that the research validates the rationale for investing in ESG and that about 90% of studies indicated a favorable relationship between ESG and firm financial performance. Another meta-analysis of 132 papers published in reputable journals reveals that 78% of studies pointed to a positive relation between sustainability and financial performance of the firm (Alshehhi *et al.*, 2018).

This type of analysis delimited three categories of relationships between ESG performance and firm profitability. Velte (2017) found that ESG has a positive effect on firm’s value (Tobin's Q) and profitability (Return on Assets -ROA) for a sample of companies from Germany. On the other hand, several multi-country studies report a negative relationship between ESG performance and firm value – profitability. Nollet *et al.* (2016) use accounting and market metrics to investigate the connection between social and financial performance of S&P 500 companies from 2007 to 2011, obtaining a negative relationship on linear models and a positive relationship on non-linear models. A recent study of Garcia and Orsato (2020) compares emerging and developed countries through a sample of 2165 firms from 2007 to 2014. It was found that in emerging markets the relationship between ESG scores and financial performance is negative.

Another group of researchers conducted studies that revealed a mixed relationship between ESG performance and financial return of the firm. For a sample of Norwegian listed firms between 2010 and 2019, Giannopoulos *et al.* (2022) examine the impact of ESG scores on financial performance. This study reveals mixed results, indicating a positive relation between ESG scores and firm value (Tobin's Q) and negative relation between ESG scores and profitability (ROA).

The ESG scores can perform as guidelines among the firm’s competitors and be reviewed cyclically to provide the market with further indications of the sustainability improvements of the firm. In this regard, De Lucia, Pazienza and Bartlett (2020) conducted a case study of 1038 public companies in Europe and applied a combined analysis with machine learning and logistic regression models. Machine learning models investigated the accuracy of ROE and ROA based on ESG and other economic indicators, while logistic regression models examined whether ESG factors affected the performance of these financial metrics. Main findings suggested that both ROE and ROA would be perfectly predicted by most ML-algorithms and that predictions performed better than the baselines. The added value of the paper is the accuracy of financial indicators such as the expected Return of Equity (ROE) and Return of Assets (ROA) on several ESG and other economic metrics, using a logistic regression model to infer on the relationships between ESG factors and ROE and ROA performances of European enterprises.

Landi and Sciarelli (2019) developed a study using a panel data analysis through a Fixed Effects Model to verify the impact of an ESG Rating on a company's abnormal return. For a sample of Italian firms listed on Financial Times Stock Exchange Milano Indice di Borsa (FTSE MIB) Index, they measured abnormal returns via Fama-French approach, running a yearly Jensen's Performance Index for each company under investigation. The authors found no statistically significant evidence of ESG assessment on Italian Blue Chips' abnormal returns. Additionally, seems that the market investors pay attention anyway to typical risk factors such as EBITDA and financial leverage, implying that the other variables included in the analysis could be considered under control and risk manageable.

Some companies can develop initiatives in one of these three dimensions that contribute to the generation of value, while others can decrease financial value. Duque-Grisales and Aguilera-Caracuel (2021)'s paper examines E, S and G separately to determine accurately the relationship of each sub-factor to firm's financial performance (FP) in Latin America. Empirical results indicate that ESG scores are negatively associated with firms' financial performance (FP) according to a random effects regression. The negative sign of this association indicates that multilatinas with the best ESG scores tend to be less profitable and this finding could occur because costs related to the implementation of ESG initiatives are not reflected in a company's FP because they are not performed in the correct manner. Another reason may indicate that there is not enough institutional support to render them more visible, thus not ensuring approval from stakeholders. Alternatively, when companies make high investments in ESG, they may sacrifice their cash flow and divert resources required for their operation, resulting in a decrease of their performance.

The ESG literature was enriched with the most recent study of Iazzolino *et al.* (2023) showing which industries are most sensitive to ESG issues, with focus on different European sectors. By taking a sample of 1979 listed firms belonging to various industrial sectors, they determined the business efficiency value, taking into account both financial and sustainability factors. From the analysis of the gap, calculated as the difference between efficiency with and without ESG, they found that ESGs impact on firm efficiency differs from one sector to another. Furthermore, it was provided empirical evidence for supporting the construction of efficient and sustainable portfolios by mapping sectors in terms of risk-return. This research revealed that methodologies for assessing ESG scores are mainly far from being standardized. Because of this, policy actions are needed to make non-financial disclosure more transparent to investors and, likewise, to provide companies with generalized and explicit guidance for non-financial (i.e., ESG) reporting.

3. Database and methodology

The aim of our study is to analyze if ESG (Environmental, Social and Governance) scores can influence the firm's performance and risk. The study focuses on companies form EU-27 countries because, according to the recent Directive of the European Commission, all listed companies have to disclose information on what they see as the risks and opportunities arising from social and environmental issues and also on the impact of their activities on people and environment.

Our database consists of 677 companies from both advanced and emerging economies from EU-27, acting in several industries - Oil, Gas & Consumable Fuels, Automobiles, Chemicals, Metals & Mining, Food Products, Tobacco, Building Products, etc. We used Reuters Eikon database that contains financial information. Table 1 shows the ESG scores grades for our sample computed for 2022 year.

Table 1. **ESG scores grades**

ESG Score Grade	No of companies
A+	9
A	84
A-	152
B+	118
B	110
B-	86
C+	57
C	25
C-	18
D+	13
D	5
Total	**677**

(*Source:* Authors' analysis)

For ESG scores, the database was also formed using Refinitiv Eikon platform. Please see Table 2 for ESG descriptive statistics recorded for companies analyzed. The database contains environmental, social, and governance scores of publicly traded companies.

Table 2. **ESG descriptive statistics**

	Average	Median	StDev	Min	Max
ESG Score	65,67	68,38	16,80	11,92	93,92
Environmental Pillar Score	62,34	65,72	22,50	0,00	99,24
Social Pillar Score	67,66	72,19	19,76	6,08	97,33
Governance Pillar Score	66,28	69,20	17,84	10,58	96,81

(*Source:* Authors' analysis)

According to the ESG descriptive statistics, for environmental pillar the minimum score was registered for 5 companies, corresponding to industries such as Hotels, Restaurants & Leisure, Trading or Machinery. On the opposite, in the Household Durables industry it has been recorded the highest score. From a social point of view, the ESG score in this area varied from 6,08 in the machinery industry to 97,33 for Textiles, Apparel & Luxury Goods industry.

Apart from the social and environmental components, in terms of governance the leading role is of the chemicals industry, whereas the lowest registered score was in the professional service area.

Table 3. **Credit ratings and rating scores**

Rating	Score
AAA	24
AA+	23
AA	22
AA-	21
A+	20
A	19
A-	18
BBB+	17
BBB	16
BBB-	15
BB+	14
BB	13
BB-	12
B+	11
B	10
B-	9
CCC+	8
CCC	7
CCC-	6
CC+	5
CC	4
CC-	3
C	2
D	1

(*Source*: Authors' analysis)

For the preliminary regression analysis, eight OLS regression model were constructed: four regressions for the profitability variable (i.e., Return on Assets, ROA) and four regressions for the credit risk variable (i.e., credit rating). Furthermore, the sample dataset was categorized by asset size and total ESG score for further analysis.

The main reason for this in-depth analysis process is to identify potential patterns in the sample dataset while gaining a better understanding of the ESG and corporate financial performance relationship in specific settings. The explanatory variables are presented in Table 4.

Table 4. **Explanatory variables**

Symbol	Variable	Explanation
Dependent variables		
ROA	Return on assets	Profitability ratio that provides how much profit a company can generate from its assets
Credit score	Credit Combined Implied Rating Scores	Agency-equivalent credit rating implied by the current estimated forward 1-year default probability from the StarMine Combined Credit Risk Model

Symbol	Variable	Explanation
ESG scores		
ESG SCORE	ESG Score	Overall company score based on the self-reported information in the environmental, social and corporate governance pillars
ESG_ENV	Environmental Pillar Score	Measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.
ESG_SOC	Social Pillar Score	A company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.
ESG_GOV	Governance Pillar Score	Measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.
Explanatory variables		
EV/EBITDA	Enterprise Value to EBITDA	This ratio measures how much a company is valued per each dollar of EBITDA.
EBITDA MARGIN	EBITDA Margin	Measure of a company's operating profit, shown as a percentage of its revenue
D/E	Total Debt to Total Equity (%)	(D/E) ratio is used to evaluate a company's financial leverage and is calculated by dividing a company's total liabilities by its shareholder equity
C_RATIO	Current Ratio	Measures a company's ability to pay its short-term liabilities using its short-term assets
LN_TOTAL ASSETS	ln(Total Assets)	Firm's size calculated by the logarithm value of the total assets in units as a proxy for company size.
INTEREST_COV_RATIO	Interest Coverage Ratio	This is a debt and profitability ratio used to determine how easily a company can pay interest on its outstanding debt

(*Source*: Authors' compilation)

The descriptive statistics for the variables used in the models are presented below in Table 5.

Table 5. **Descriptive statistics**

	Average	Median	StDev	Min	Max
ESG Score	65.67	68.38	16.80	11.92	93.92
Environmental Pillar Score	62.34	65.72	22.50	0.00	99.24
Social Pillar Score	67.66	72.19	19.76	6.08	97.33
Governance Pillar Score	66.28	69.20	17.84	10.58	96.81
Enterprise Value to EBITDA	11.06	7.89	17.26	0.43	226.60
EBITDA Margin	0.18	0.15	0.12	-0.03	0.90
Total Debt to Total Equity, Percent	1.11	0.67	1.69	0.00	19.54
Current Ratio	1.55	1.34	0.88	0.28	9.23
ln(Total Assets, Reported	22.29	22.24	1.66	18.32	27.06
Interest Coverage Ratio	37.91	11.92	119.91	-9.79	1541.59

(*Source*: Authors' calculations based on Eurostat)

We have also tested for identifying multi-collinearity. The correlation matrix for this dataset is presented in Table 6. We did not consider the variables correlated at a higher level than 0.4 in the same regression. This approach is based on the fact that otherwise bias coefficients of the independent variables can be obtained in the regression models upon which the research was conducted.

Table 6. **Correlation matrix**

	ESG scores	ESG_ENV	ESG_SOC	ESG_GOV	EV/EBITDA	EBITDA MARGIN	D/E	C_RATIO	LN_TOTAL ASSETS	INTEREST_COV_RATIO
ESG scores	1,00									
ESG_ENV	0,87	1,00								
ESG_SOC	0,91	0,73	1,00							
ESG_GOV	0,66	0,38	0,43	1,00						
EV/EBITDA	-0,04	-0,02	-0,05	-0,04	1,00					
EBITDA MARGIN	0,02	-0,03	0,03	0,05	-0,15	1,00				
D/E	0,06	0,06	0,05	0,01	0,02	0,02	1,00			
C_RATIO	-0,12	-0,11	-0,12	-0,04	-0,04	0,17	-0,26	1,00		
LN_TOTAL ASSETS	0,59	0,55	0,53	0,34	0,00	0,07	0,06	-0,15	1,00	
INTEREST_COV_RATIO	-0,05	-0,04	-0,04	-0,03	-0,02	0,06	-0,13	0,22	-0,01	1,00

(*Source*: Authors' calculations)

4. Results

In this section we tested the impact that financial performance, through the measure of ROA, and the credit combined implied rating scores have on ESG components such as governance score, social score or environment score. Moreover, we included in this model explanatory variables including EV/EBITDA, Total Debt/Total Equity, ln (Total assets), current ratio in order to obtain an overview regarding future directions and possible impact on the profitability of the firm. The results are presented in Table 7 and Table 8. We used an OLS regression model to highlight whether financial performance or credit risk can be influenced by several factors. We did not consider in the same regression the variables correlated at a higher level than 0.4, t-statistics are in parentheses. The symbols *, **, *** represent significance levels of 10%, 5% and 1%.

Table 7 shows the result of the regression analyzed using financial performance (ROA) as a dependent variable. Overall, models indicated a positive influence on global ESG score and only ESG sub-factors - environmental (E) and social (S).

Table 7. **The model estimated results for financial performance (ROA)**

Variable	(1)	(2)	(3)	(4)
ESG scores	**0.0004*** (1.80)			
ESG_GOV		0.0001 (0.79)		
ESG_SOC			**0.0002*** (1.81)	
ESG_ENV				**0.0003**** (2.03)
EV/EBITDA	**-0.0006**** (-2.55)	**-0.0006***** (-2.60)	**-0.0006***** (-4.26)	**-0.0006***** (-2.65)
EBITDA MARGIN	**0.1559***** (5.97)	**0.1543***** (5.87)	**0.1548***** (7.50)	**0.1587***** (6.01)
D/E	**-0.0076***** (-4.73)	**-0.0076** -(4.6)	**-0.0076***** (-4.96)	**-0.0077***** (-4.77)
C_RATIO	**0.0086**** (2.54)	**0.0084**** (2.48)	**0.0087***** (2.84)	**0.0084**** (2.46)
LN_TOTAL ASSETS	**-0.0053**** (-2.42)	**-0.0033*** (-1.94)	**-0.0046***** (-2.59)	**-0.0053***** (-2.62)
INTEREST_COV_RATIO	**6.48E-05**** (2.34)	**6.34E-05**** (2.31)	**6.39E-05***** (2.98)	**6.44E-05**** (2.33)
R-squared	20.48%	11.29%	20.28%	20.56%
Number of observations	677	677	677	677

(*Source*: Authors' calculations)

The total ESG factor variable is economically and statistically significant. It supplements the literature findings of the positive relationship between ESG and performance. As Li *et al.* (2018) argued, there is a strong relation between the level of ESG reporting and firm value, indicating that stakeholders and investors trust and accountability have a positive influence on firm value. According to our results the environmental (E) and social (S) component have a positive influence on firm performance, so we can conclude that companies that pursue the protection of the environment and have social programmes for local communities will record a higher return. The Governance component is not significant so this component cannot influence the total assets performance.

The control variables that we considered show that ROA is positively influenced by EBITDA margin, interest cover ratio and current ratio. This confirms the literature as higher profits in terms of EBITDA means a better utilization of assets and also that firms with lower risk (both on the long term and short term) provide a better performance ratio. In addition, our study shows that, in 2022, in the industries analyzed where companies register a higher size tend to have lower ROA, and also a higher D/E ratio will to the same result. It is surprising that a higher EV/EBITDA also negatively influences ROA. An explanation could be that the company is more attractive in the market, but this is not a key for an increase in ROA.

We have conducted a further analysis by studying the influence between the three components of ESG and firm credit rating. Table 8 shows the results of the four regressions conducted using the credit risk variable (i.e., credit rating).

Table 8. **The model estimated results for credit risk**

Variable	(1)	(2)	(3)	(4)
ESG score	**0.0029*** (2.78)			
ESG GOV		0.0070 (1.02)		
ESG SOC			**0.0248***** (3.07)	
ESG ENV				**0.0200***** (2.78)
EV/EBITDA	-0.0011 (-0,17)	-0.0021 (-0,24)	-0.0010 (-0,32)	-0.0016 (-0,16)
EBITDA MARGIN	**2.7344*** (2.84)**	**2.6228*** (2.72)**	**2.6571*** (2.80)**	**2.8965*** (2.97)**
D/E	**-0.6329*** (-5.35)**	**-0.6281*** (-5.13)**	**-0.6303*** (-5.31)**	**-0.6369*** (-5.39)**
C_RATIO	**0.2535** (2.05)**	**0.2394* (1.93)**	**0.2605** (2.10)**	**0.2407* (1.95)**
LN_TOTAL ASSETS	-0.0163 (-0,25)	**0.1346** (2.09)**	0.0064 (0,14)	0.0096 (0,10)
INTEREST_COV_RATIO	**0.0038***** (2.78)	**0.0037***** (2.78)	**0.0037***** (2.78)	**0.0037***** (2.81)
R-squared	0.2464	0.2281	0.2479	0.2438
Number of observations	677	677	677	677

(*Source*: Authors' calculations)

Similarly, the total ESG variable is economically and statistically significant. This implies that banks' scoring systems are awarding higher scores to companies that prioritize and closely align with their ESG policies. The social and environmental component are positively influencing credit ratings, while governance component is not significant. This means that present bank policies are more focused on green and environment-friendly companies and entities with CSR programmes implemented. Governance, for the moment, seems not to be so important.

The control variables that we considered in the model show that credit risk is positively influenced by EBITDA margin, interest cover ratio and current ratio, because, according to our classification, the higher the credit risk number, the better credit rating is. This confirms the literature as higher profits in terms of EBITDA leads to a better credit risk rating and also, firms with lower risk ratios (both on the long term and short term) provide better possibilities for bank to borrow. Also, our study shows that, in 2022, in the industries analyzed, companies that have a higher size tend to have better bank score, and also, as we expected, a higher D/E ratio will lead to a higher credit risk.

5. Conclusions

Integrating ESG criteria into business decisions capital allocation by large institutional investors is a dominant theme in the global capital markets in recent years. Thus, investors are increasingly considering non-financial criteria, such as the impact of environmental impact of companies' activities, the relationship with employees, suppliers and other stakeholders, or implementation of the highest standards of corporate governance in the analysis of companies in their investment universe.

From a managerial point of view, several studies suggest that managers and CEOs should pay more attention to ESG components as a monetary tool that should both form an integral part of a firm's strategy and contribute to targeted issues in the societies in which they operate. Moreover, managers should consider ESG as an investment, not an expense.

Increasing awareness of ESG is necessary, with the belief that the financial system can play a pivotal role in driving the transition towards a more sustainable economy. As our results show, companies with better ESG policies will also record an increase in performance and credit risk ratings.

Subsequent research could utilize this policy review to evaluate the effectiveness of European policies in aligning with ESG principles. Additionally, expanding the scope of analysis to incorporate the regulatory frameworks of countries outside the EU could offer valuable insights and contribute to the ongoing discussion.

References

Alshehhi, A., Nobanee, H., & Khare, N. (2018) The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. *Sustainability*, vol. 10, no. 2: 494

Bruno, M. & Lagasio, V. (2021) An Overview of the European Policies on ESG in the Banking Sector. *Sustainability*, *vol. 13*: 12641, https://doi.org/10.3390/su132212641

De Lucia, C., Pazienza, P., & Bartlett, M. (2020) Does Good ESG Lead to Better Financial Performances by Firms? Machine Learning and Logistic Regression Models of Public Enterprises in Europe. *Sustainability*, vol. 12: 5317, https://doi.org/10.3390/su12135317

Duque-Grisales, E., Aguilera-Caracuel, J. (2021) Environmental, Social and Governance (ESG) Scores and Financial Performance of Multilatinas: Moderating Effects of Geographic International Diversification and Financial Slack, *Journal of Business Ethics*, vol. 168: 315–334, https://doi.org/10.1007/s10551-019-04177-w

Friede, G., Busch, T., & Bassen, A. (2015) ESG and financial performance: Aggregated evidence from more than 2000 empirical studies, *Journal of Sustainable Finance & Investment*, vol. 5, no. 4: 210–233.

Giannopoulos, G., Fagernes, R.V.K., Elmarzouky, M., & Hossain, K.A.B.M.A. (2022). The ESG disclosure and the financial performance of Norwegian listed firms. *Journal of Risk and Financial Management*, vol. 15, no. 6: 237

Iazzolino, G., Bruni, M. E., Veltri, S., Morea, D., & Baldissarro, G. (2023). The impact of ESG factors on financial efficiency: An empirical analysis for the selection of sustainable firm portfolios. Corporate Social Responsibility and Environmental Management, 1–11. https://doi.org/10.1002/csr.2463

Landi, G. and Sciarelli, M. (2019), Towards a more ethical market: The impact of ESG rating on corporate financial performance, *Social Responsibility Journal*, vol. 15, no. 1: 11-27, https://doi.org/10.1108/SRJ-11-2017-0254

Li, Y., Gong, M., Zhang, X., & Koh, L. (2018). The impact of environmental, social, and governance disclosure on firm value: The role of CEO power, *The British Accounting Review*, vol. 50, no. 1: 60–75.

Mahmut Aydoğmuş, Güzhan Gülay, & Korkmaz Ergun (2022), Impact of ESG performance on firm value and profitability, *Borsa Istanbul Review*, vol. 22, no. suppl. 2: S119-S127, https://doi.org/10.1016/j.bir.2022.11.006.

Manabe, T., & Nakagawa, K. (2022) The value of reputation capital during the COVID-19 crisis: Evidence from Japan, *Finance Research Letters*, vol. 46: 102370, https://doi.org/10.1016/j.frl.2021.102370

Nollet, J., Filis, G., & Mitrokostas, E. (2016) Corporate social responsibility and financial performance: A non-linear and disaggregated approach, *Economic Modelling*, vol. 52, part B: 400–407

Refinitiv (2022) Environmental, Social and Governance Scores, Brochure on Refinitiv Website, May 2022, available on-line at https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf.

Velte, P. (2017) Does ESG Performance have an impact on financial performance? Evidence from Germany, *Journal of Global Responsibility*, vol. 8, no. 2: 169–178

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