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- Al VIII-lea Congres al profesiei de auditor financiar din România: **Raportarea corporativă privind sustenabilitatea – noi provocări și oportunități pentru profesia de auditor financiar**
- The VIIIth Congress of the Romanian Financial Audit Profession: **Sustainability in Financial Reporting – New Challenges and Opportunities for Financial Audit**



- **De la declarația nefinanciară la raportarea privind durabilitatea: noi provocări pentru analiștii și auditorii financiari**
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27 October 2023**

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From Non-Financial Disclosure to Sustainability Reporting: New Challenges for Financial Analysts and Auditors

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Abstract

In the context of recurrent ecological and societal crises, the European institutions are committed to fostering sustainable development that meets the needs of present and future generations, while providing new opportunities for employment, investment and economic growth. These commitments are the guiding principle of European policies and strategies in terms of financing sustainable growth, green transition, and building an economy at the service of citizens. They have been gradually transposed into a large number of European regulations, including those related to sustainability disclosure by certain categories of economic and financial actors. The significance of the paradigm shift fuels the reflection on the relationship between these new regulations and the social reality, in which and upon which they must act. The new regulations referring to are especially: Regulation (EU) 2019/2088 of the European Parliament and of the Council on sustainability-related disclosures in the financial services; Regulation (EU) 2020/852 of the European Parliament and of the Council on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Taxonomy Regulation); Directive (EU) 2022/2464 of the European Parliament and of the Council amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting.

As part of the European and international sustainability concerns, this article is a reflection paper on the developments, notably conceptual, axiological and substantive, generated by the Directive (EU) 2022/2464, and their translation into legal and practical innovations. Based on an extensive review of the relevant literature and European legislation, as well as on content analysis and secondary analysis of numerous scientific studies in the field, authors' contribution focuses on the meaning and implications of the switch from 'non-financial information' to 'sustainability information', as well as on the new relationship between the law and the social reality created by Directive (EU) 2022/2464.

The authors assume that such clarifications are a prerequisite for the successful transformation of certain professions significantly affected by this Directive, including those of financial analysts and auditors. This requires, at the same time, upstream changes of

university curricula and continuing education in this area, as well as in research programs.

Key Words: non-financial information; sustainability reporting; double materiality; value chain; performativity;

JEL Classification: M41, M42, Q52.

1. Theoretical Framework

The Intergovernmental Panel on Climate Change (IPCC) defines 'sustainable development' as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs"¹. Sustainability is defined as "A dynamic process that guarantees the persistence of natural and human systems in an equitable manner"². These definitions did not arise ex nihilo, but are the fruit of a long process of awareness that lasted almost two centuries. In order to understand the maturation of these ideas, which generated much controversy, inspired a diversity of theories and gradually gave rise to new legislation, it is necessary to retrace their genesis and evolution.

1.1. Avant-garde theories

Before the term 'sustainable development' became an official concept, the idea of the impossibility of unlimited growth had already been theorized by Thomas Malthus in 1798. He opposed population growth, doubling every 25 years, to the natural limitation of land available to feed this population, aggravated by diminishing returns and the fact that the best land was already exploited. Therefore, the only possible remedy was birth control³, especially among the poorest⁴. But the Industrial Revolution invalidated Malthus' theory of diminishing returns.

The idea of an imbalance between needs and available resources has gained ground. Thus, Theodore Roosevelt, American statesman, declared in his speech at the 1908 Wildlife Conservation Conference in Washington: "We

have a duty to nature, and we must be accountable for how we pay it off every day." In 1909, in a statement to the U.S. Senate, he defended ideas of sustainability and responsibility, even though the syntagma 'sustainable development' was not used: "With the steady growth in population and the still more rapid increase in consumption our people will hereafter make greater and not less demands per capita upon all the natural resources (...). If we of this generation destroy the resources from which our children would otherwise derive their livelihood, we reduce the capacity of our land to support a population, and so either degrade the standard of living or deprive the coming generations of their right to life on this continent."

In 1972, the Club of Rome, a think tank close to the Organization for Economic Co-operation and Development (OECD) that brought together scientists, economists, government officials and business leaders from 52 countries, published the *Limits to Growth Report*, also known as the *Meadows Report*, after its two principal authors. The introduction begins with a quote from Maha Thray Sithu U Thant, the United Nations (UN) Secretary-General at the time, who stated in 1969: "I do not wish to seem overdramatic, but I can only conclude from the information that is available to me as Secretary-General, that the Members of the United Nations have perhaps ten years left in which to subordinate their ancient quarrels and launch a global partnership to curb the arms race, to improve the human environment, to defuse the population explosion, and to supply the required momentum to development efforts. If such a global partnership is not forged within the next decade, then I very much fear that the problems I have mentioned will have reached such staggering proportions that they will be beyond our capacity to control."⁵

This fear of exponential population growth, underlying Malthus' predictions, is illustrated by the metaphor of the water lily. "A water lily on a pond doubles its surface area every day. Knowing that it takes 30 days to cover the entire pond, thus suffocating all aquatic life, the question arises: is the time it covers half of the

¹ Intergovernmental Panel on Climate Change (IPCC) (2014), Fifth Assessment Report (AR5) Glossary. (https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_annex-i.pdf), p. 133.

² *Ibid.*

³ Malthus, T. R. (1992), *Essai sur le principe de population*, Paris, Flammarion. First edition in English: 1798.

⁴ Malthus was a pastor who only envisaged abstinence to limit births. He demanded much of humanity...

⁵ Meadows, D.H., Meadows, D.L., Randers, J., Behrens, W. W. III (1972), *The limits to growth: a report for the club of Rome's project on the predicament of mankind*, New York, Universe Books, p. 17 (https://collections.dartmouth.edu/texts/meadows/diplomatic/meadows_ltg-diplomatic.html#pg-17).

pond the last limit to act?"¹. Intuitively, one would be tempted to answer that the deadline is 15 days. But dealing with an exponential growth, half of the pond is covered after 29 days and then there is only one more day to reach the point of no return because the pond will be completely covered on the 30th day.

The report on "*The limits of growth*" goes beyond the limits outlined by Malthus, who was concerned only with the earth's ability to meet food needs, integrating environmental pollution and depletion of non-renewable natural resources. The proposed solutions therefore aim at birth control to neutralize the very rapid growth of the world's population, but also at a transformation in the industrial model to save non-renewable natural resources and reduce pollution. The Club of Rome, unlike Malthus, advocated a change whose costs and benefits would be fairly distributed in order to forge a stable society. The idea of sustainable development is present, but the term is not used. The report conceptualizes the notion of '*global equilibrium*', characterized by an essentially stable population and capital (in the sense of investment), with the forces that tend to increase or decrease them being carefully balanced and in accordance with society's system of values². The *Report*³ also includes matters related to the progress of science in an industrialized world⁴, which invalidates Malthus' theory of diminishing returns.

The prospect of an imbalance between actual or perceived needs and the availability of different resources to be consumed became apparent to a large public, affected in their daily lives, with the first oil shock in 1973, after the Yom Kippur War and the oil embargo decreed by the Organization of the Petroleum Exporting Countries (OPEC). The second oil shock, in 1979, after the Iranian revolution and the Iran-Iraq war, precipitated this awareness of an imbalance that could only get worse. In 1983, the Secretary-General of the UN entrusted Gro Harlem Brundtland with the creation of the World

Commission on Environment and Development, which published in 1987 a report entitled *Our Common Future*⁵, known as the *Brundtland Report*. For the first time, the *Brundtland Report* theorized the concept of 'sustainable development' as requiring "meeting the **basic needs** of all and extending to all the opportunity to satisfy their aspirations for a better life. (...) *Meeting essential needs requires not only a new era of economic growth for nations in which the majority are poor, but an assurance that those poor get their fair share of the resources required to sustain that growth. (...) those who are more affluent [should] adopt life-styles within the planet's ecological means (...) rapidly growing populations can increase the pressure on resources and slow any rise in living standards; thus, sustainable development can only be pursued if population size and growth are in harmony with the changing **productive potential of the ecosystem** (...). Sustainable development is not a fixed state of harmony, but rather a process of change (...). Painful choices have to be made*"⁶. Moreover, the report states that: "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*"⁷.

This definition is extremely complex. It introduces the notion of '*basic needs*' while recognizing that they have a social and cultural determination. But meeting these needs extends to everyone and requires sacrifices on the part of the richest and control of population growth. Sustainable development does not exclude economic growth, on the contrary it assumes it, as "*A world in which poverty and inequity are endemic will always be prone to ecological and other crises*"⁸. Finally, the definition introduces the concept of '*productive potential of the ecosystem*', which implies a balance between the multitude of constraints facing humanity.

1.2. Controversies of economists

Despite the warnings mentioned above, economics and management sciences have not always proposed adequate responses to the challenges of sustainable development. One of the fundamental economic theories,

¹ Delaunay, J. (1972), *Halte à la croissance ? Enquête sur le Club de Rome*, Paris, Fayard, p. 143, p. 5.

² Idem, p. 277

³ "*The Limits to Growth*" report was updated by the Meadows team in 2004. Meadows, D. H., Meadows, D. L., & Randers, J. (2004). *The limits to growth: The 30-year update*. White River Junction, VT: Chelsea Green Publishing Co. (<https://www.peakoilindia.org/wp-content/uploads/2013/10/Limits-to-Growth-updated.pdf>).

⁴ Idem, pp. 278-281

⁵ Brundtland G. H. (1987), *Our Common Future*, United Nations, (<https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>)

⁶ Idem, paragraphs 4, 28, 29, 30.

⁷ Idem, paragraph 1.

⁸ Idem, paragraph 4.

that of regulation, found its materialization in the evolution of capitalism and, in particular, in its 'great transformation' in the late 70s: the neoliberalism that succeeded industrial capitalism. *"The reality of this transformation is undeniable. It is attested by (...) control of capital, wage labor and money. This is where investment and growth are decided (...)".*¹ Neoliberal theory, promoted mostly by the Chicago School, especially by Milton Friedman, dominated the second half of the twentieth century and the beginning of the twenty-first century. It inspired public policies, as well as structural adjustment programs in the context of the so-called 'Washington Consensus', implemented, with highly contested results, by the Bretton Woods institutions. Blind reliance on market forces as a global regulator and concentration of capital on a planetary scale, unparalleled in the history of capitalism, have led to dramatic consequences in terms of wealth polarization, rising inequalities, and anarchic exploitation of resources. In Milton Friedman's view, *"there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud"*². Such theories are at the origin of *"excessive profit demands, such as the famous ROE (return on equity) of 15% or more"*³.

In opposition to neoliberal theories, at the end of the twentieth century, Amartya Sen, winner of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel, drew attention to the fact that economics favored the accumulation of goods and services without concern for the rights and capabilities of individuals⁴. By introducing the notion of 'capability', he considers that poverty must be analyzed from the point of view of freedom of action and the ability to act, i.e., beyond monetary matters. Under the influence of his thesis, the United Nations Development Programme (UNDP)

proposed as a measuring tool the 'Human Development Index', which combines three 'capabilities' considered essential: health (life expectancy), education (literacy rate) and monetary resources (GDP/capita in PPP)⁵ in assessing development at international level. These proposals are currently reflected in different reporting models⁶ as relates to the delivery of the UN 2030 Agenda.

Other, more recent theories emphasize the role of social and environmental factors in human development and the equilibrium of the planet. Thus, Swedish scientist Johan Rockström, known for his work on sustainability, has set nine boundaries, which must not be crossed to maintain the balance of the planet: climate change, biodiversity loss; disruption of the nitrogen and phosphorus cycle; change of land use; ocean acidification; ozone depletion; air pollution; use of drinking water; chemical pollution⁷. Some of these boundaries are also benchmarks for sustainability factors embedded in European regulations.

British economist Kate Raworth, author of the Doughnut theory, argues for the need to rethink the economy, taking into account both the satisfaction of basic human needs and Earth's limited ability to meet them. According to this theory, a just and sustainable world must be situated in the space⁸ between external limits, expressed by planetary limits, and internal limits, expressed by human rights, essential to human dignity.

These demands for change have also found a certain materialization in management science. The famous *agency theory*, which develops the agency relationship⁹ between the shareholder (the principal) and the agent (the manager), is gradually replaced by the *stakeholder theory*, according to which a multitude of actors are affected by a company's activities, either directly starting from contractual relationships (employees, suppliers, customers) or indirectly, through the impact these

¹ Aglietta M. (2004), *Régulation et crises du capitalisme*, Paris, Odile Jacob, 1997; R. Boyer, *Théorie de la régulation: les fondamentaux*, Paris, La Découverte.

² This statement appeared in a *New York Times* article on September 13, 1970. (<https://www.nytimes.com/1970/09/13/archives/a-friedman-doctrine-the-social-responsibility-of-business-is-to.html>)

³ Orléan, A. (2013), "Le néolibéralisme entre théorie et pratique, Entretien avec André Orléan", *Cahiers philosophiques*, n° 133, p. 9-20

⁴ Sen, A. (2003), *Un nouveau modèle économique. Développement, justice, liberté*, Paris, Odile Jacob.

⁵ PPP signifies purchasing power parity.

⁶ In French, the equivalent is 'rapportage', but the English term 'reporting' is more commonly used in the business world.

⁷ Rockström, J. *et al.* (2021): *Breaking Boundaries: The Science Behind our Planet*, DK.

⁸ Raworth, K. (2018), *La théorie du donut: l'économie de demain en 7 principes*, Paris, Ed. Plon.

⁹ Jensen, M. C., & Meckling, W. H. (1976), "Theory of the firm: Managerial behavior, agency costs and ownership structure". *Journal of Financial Economics*, Volume 3, Issue 4, October, p. 305-360

activities have on their environment¹. More recently, the principle of double materiality (see §3.1.1.2.), which underpins the European standardization of sustainability reporting, refers to key decision-makers focusing both on the financial performance of the company and its impact on the social and natural environment.

1.3. The impetus given by international organizations and civil society

Commitment to sustainable development is one of the priorities of the UN. The UN 2030 Agenda for Sustainable Development, adopted in 2015, reflects growing global awareness that a sustainable development model for current and future generations is the best way to eradicate poverty and protect the planet. All other international organizations, as well as countries that are signatories to the 2020 Agenda, support the UN in achieving the 17 Sustainable Development Goals. Thus, Romania has recently adopted the National Strategy for Sustainable Development for 2030 (NSSDR 2030), and France, its National Strategy for Biodiversity, complementary to other sectoral strategies, as an expression of national commitments to achieve universal goals.

To the warnings of scientific circles and international organizations are added those of the civil society and religious bodies. We mention, among others, the intervention of one of the highest religious and moral authorities, Pope Francis, who published in 2015 an encyclical *"On the care of our common home"*, *Laudato si'*. This solemn letter of the Pope to all members of the universal² Church is not intended to deal with scientific debate, but to place the notion of sustainable development in the social and ethical context of a civilization, which could go to its own destruction, adding a moral and religious dimension to it. *"Following a period of irrational confidence in progress and human abilities, some sectors of society are now adopting a more critical approach."*³ *"The urgent challenge to protect our common home includes a concern to bring the whole human family*

*together to seek a sustainable and integral development, for we know that things can change"*⁴.

The Pope emphasizes the link between technology, and the production and consumption of goods in society. *"[T]echnological products are not neutral, for they create a framework which ends up conditioning lifestyles and shaping social possibilities along the lines dictated by the interests of certain powerful groups. Decisions which may seem purely instrumental are in reality decisions about the kind of society we want to build. (...) The technological paradigm has become so dominant that it would be difficult to do without its resources and even more difficult to utilize them without being dominated by their internal logic. (...) those who are surrounded with technology «know full well that [what is at stake] is neither (...) profit nor (...) the well-being of the human race», but (...) power"*⁵.

The question that arises naturally is whether that in the face of this power, there is a counterpower. The Pope is very critical in this regard. *"It is remarkable how weak international political responses have been."* However, in *"dealing with grave environmental and social problems worldwide, (...) [a] global consensus is essential", as "[p]olitics and business have been slow to react in a way commensurate with the urgency of the challenges facing our world. (...) [T]he post-industrial period may well be remembered as one of the most irresponsible in history"*⁶.

Can the market then regulate externalities resulting from human activities? According to the Pope, *"by itself the market cannot guarantee integral human development and social inclusion"*⁷. *"The environment is one of those goods that cannot be adequately safeguarded or promoted by market forces"*. If *"the market tends to promote extreme consumerism ... [a] change in lifestyle could bring healthy pressure to bear on those who wield political, economic and social power"*⁸. *"Purchasing is always a moral – and not simply economic – act"*⁹.

¹ Freeman, R.E. (1984), *Strategic Management: A Stakeholder Approach*, Cambridge University Press.

² 'Catholic' means 'universal' in Greek.

³ Encyclical Letter (2015), *Laudato si' On the Care of Our Common Home*, paragraph 19, (https://www.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html)

⁴ *Idem*, paragraph 13

⁵ *Idem*, paragraph 107, 108

⁶ *Idem*, paragraph 54, 164, 165

⁷ *Idem*, paragraph 109 – quotes Benedict XVI, Encyclical Letter *Caritas in Veritate* (29 June 2009), 35: AAS 101 (2009), 671.

⁸ *Idem*, paragraph 190 quotes Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church*, 470.

⁹ *Idem*, paragraph 206 quotes Benedict XVI, Encyclical Letter *Caritas in Veritate* (29 June 2009), 66: AAS 101 (2009), 699.

However, the Pope probably doesn't have too many illusions.

2. Moving from non-financial disclosure to sustainability reporting: meaning and implications of the change

Sustainability has long been at the heart of the European Union's project, as its social and environmental dimensions were already in the treaties establishing the Union. According to Article 11 of the Treaty on the Functioning of the European Union (TFEU), *"Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development."*¹ An important number of articles also concern fundamental social rights (Articles 151-166, Article 8, etc.), respect for the European Social Charter (Turin, 1962), the European Charter of Fundamental Social Rights etc.

The European institutions have repeatedly expressed concern about the increasingly damaging consequences of climate change and resource depletion on life on the planet. In recent years, especially in the context of the COVID-19 crisis, they have committed to promoting a system of development that meets the needs of present and future generations, while offering new opportunities for employment, investment and growth², commitments that are the guiding principle of European policies and strategies. These include the *Action Plan: Financing Sustainable Growth*³, the *European Green Deal*⁴, which is the Union's new growth strategy, and the *Strategy for*

*financing the transition to a sustainable economy*⁵.

Sustainability issues are subject to a significant number of European regulations, their dynamics and content being in line with the social reality, in which, and upon which, they must act. In this context, the European legislator has paid particular attention to the disclosure of sustainability information by certain categories of companies, whose availability, relevance, comparability and reliability are a prerequisite for achieving European strategic objectives.

The recent Directive (EU) 2022/2464 of December 2022 on corporate sustainability reporting amended the Accounting Directive 2013/34/EU⁶, more specifically its provisions on disclosure of non-financial information introduced by Directive 2014/95/EU⁷. This change is a response to new demands to improve companies' reporting on social and environmental information, to make it more transparent, reliable and relevant, to serve as levers for the transition to a more sustainable and inclusive economy. Directive 2014/95/EU entered into force in 2016 and was applied for the first time in 2018 for the fiscal year 2017. It was transposed into Romanian national legislation by OMFP No. 1938/2016⁸, and into French legislation by Ordinance No. 2017-1180 of July 19, 2017⁹. Shortly after the first application of Directive (EU) 2014/95, in December 2019, the European

⁵ COM(2021) 390 final Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: *Strategy for Financing the transition to a sustainable economy*.

⁶ DIRECTIVE (EU) 2013/34/ of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, amending Directive 2006/43/EC of the European Parliament and of the Council and repealing Council Directives 78/660/EEC and 83/349/EEC, hereinafter referred to as the Accounting Directive.

⁷ DIRECTIVE (EU) 2022/2464 of the European Parliament and of the Council amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU as regards corporate sustainability reporting.

⁸ MPF Order No. 1938/2016 of 17 August 2016 amending and supplementing certain accounting rules.

⁹ Ordinance No. 2017-1180 of 19 July 2017 on the publication of non-financial information by certain large companies and certain groups of companies; Decree No. 2017-1265 of 9 August 2017 implementing Ordinance No. 2017-1180 of 19 July 2017 on the publication of non-financial information by certain large companies and groups of companies.

¹ TFEU, *Treaty on the Functioning of the European Union*, consolidated version (2012), Art. 11, Official Journal C326/47

² COM(2018) 97 final, Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee and the Committee of the Regions: *Action Plan: Financing Sustainable Growth*.

³ *Ibid.*

⁴ COM(2019) 640 final Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: *The European Green Deal*.

Commission committed to reviewing its provisions in one of the above-mentioned reference documents, the *European Green Deal*. The commitments to revise, followed by the replacement of the Directive (EU) 2014/95 after five years of application, raise a number of questions about the causes, content and extent of these changes, of which we state a few, that will serve as a guiding thread for our reflection:

- What is the significance and implications of changing the syntagma 'non-financial information' to 'sustainability information'?
- What is the new relationship between rules of law and social reality, created by Directive (EU) 2022/2464?
- What are the new challenges for analysts and auditors?

To answer these questions, we propose a reflection paper on the developments, notably conceptual, axiological and substantive, generated by the Directive (EU) 2022/2464, and their translation into legal and practical innovations. We assume that such clarifications are a prerequisite for the implementation of this Directive, but also for the successful transformation of certain professions significantly impacted by the Directive, including analysts and financial auditors. Their reflection is based on extensive documentation from literature and European legislation, content analysis and secondary analysis of numerous scientific studies in the field.

2.1. A meaningful change of syntagm

Directive (EU) 2022/2464 marks a break with Directive (EU) 2014/95, primarily at a terminological level, by replacing the syntagm 'non-financial information' with 'sustainability information'. Recital 8 of the Directive provides the following arguments in favor of this amendment:¹

- inaccuracy of the term, since the adjective 'non-financial' would mean *'that the information in question is of no financial relevance'*;
- the practices of a significant number of organizations, initiatives and practitioners that refer to *'sustainability information'*;
- the increasing financial relevance of this type of information.

¹ Directive (EU) 2022/2464, Whereas 8.

However, beyond these considerations, other arguments can be made in favor of this change of syntagm. First, there is a lack of consensus about the current meaning and academic definition of the term 'non-financial information'. Very conclusive in this regard is the study² of a group of French researchers on the content of publications in relevant journals on the topic of non-financial information, conducted between 1980 and 2012. According to the authors, of the 318 articles identified, which contain the syntagm 'non-financial', *"only 14 give a definition of the concept, while 56 do not define it, but develop research or reflections based on themes or examples clear and detailed enough to help define it. The other texts (...) address issues related to this concept without providing any definition or concrete example that could help clarify it"*³.

The 14 definitions, although different in content, implicitly promote the idea that the notion of non-financial information refers to information presented outside the financial statements and therefore does not originate from accounting. This approach also reflects the Financial Accounting Standards Board (FASB)'s view that non-financial information is defined as information that is not disclosed in the basic financial statements, namely the Balance Sheet, Income Statement, Statement of Cash Flows and Notes. The definition proposed by the authors of this study is based on the same logic: *"non-financial information covers all quantitative or qualitative information that is provided outside the financial statements, that is not produced by accounting and financial information systems and that does not have a direct and easily measurable link to financial performance"*⁴.

Without mentioning the content of the term 'non-financial', the vast majority of academic definitions take the form of negations: "not related to the balance sheet", "outside the scope of financial statements", "outside financial statements" etc. This wording is as vague as it is broad, as it covers matters related to corporate social responsibility (CSR), as well as matters related to the company's non-financial performance, such as number of defects, quality classes, number and preferences of

² Protin, P., Gonthier-Besacier, N., Disle, Ch., Bertrand, F., Périet, S. (2014), "L'information non financière. Clarification d'un concept en vogue", *Revue française de gestion* 2014/5 (n° 242), p. 37-47.

³ *Idem*, p. 39

⁴ *Idem*, p. 45

consumers, etc. By inducing the idea that the issues mentioned have no financial impact, the approach is misleading, both for the company and for the other stakeholders.

Directive (EU) 2014/95 takes the same approach. Non-financial information contributing, in the spirit of this Directive, to an *"understanding of the undertaking's development, performance, position and impact of its activity, relating to, as a minimum, environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters"*¹. The information required in the non-financial statement covered five priority areas: business model, policies related to the above issues, outcomes of these policies, risks, and non-financial performance indicators.

The vagueness of the term and the perspective of the approach affect the relevance, reliability and comparability of information and, consequently, the quality of reporting on social, environmental and governance issues, justifying the change of syntagm. Compared to the term 'non-financial information', 'sustainability information' refers to a clear idea, carrying a precise meaning, which refers to the 'persistence' of things, human and natural systems. Its connection with current reality and representation in the collective consciousness are, a priori, more easily perceptible, especially in association with social and environmental emergencies, with the challenges of sustainable development.

2.2. A change of syntagm that makes information more performative

Directive (EU) 2022/2464 is also based on the implicit assumption that information is performative: it creates reality, it modifies behaviors. *"To say is to do."*² It opposes an ascertaining statement to a performative one³. Article 1(4) (§ 3) states that *"Large undertakings, and small and medium-sized undertakings, except micro undertakings (...) shall include in the management report information necessary to understand the undertaking's impacts on sustainability matters, and information necessary to understand how sustainability matters affect the undertaking's development, performance and position"*.

¹ Directive (EU) 2014/95, Art. 1.

² Austin, J.L. (1970), *Quand dire, c'est faire*, Ed. Le Seuil, Paris

³ Burlaud, A., Niculescu, M. (2015), "Non-financial information: a European perspective", *Financial Audit* XIII Nr. 6 (126), p. 102-112, Bucharest

Stating such a policy constitutes a commitment, a promise and creates an obligation. The change of syntagm is important because of its symbolic effects, as it generates changes in the representation of actors and individuals⁴.

However, no statement is performative in itself. Performativity (realization of speech predictions) requires collective engagement, involving both the authors of the 'performative statement' and the targets of these pronunciations. Directive (EU) 2022/2464, through the meaning, value, content and status of statements, makes sustainability information more performative.

2.3. An incremental change of syntagm

The transition from 'non-financial information' to 'sustainability information' has been progressive, following the logic of European thinking that starts from the general aspects of building the sustainable and inclusive European single market, to the proposal of European sustainability standards with a global vocation. This logic corresponds at microeconomic level to that of decision-making, which starts from financing decisions and investment options to operating decisions. The changes were necessarily ensured in an incremental, step-by-step manner, which led to an evolution of information and reporting requirements. Thus, general policy documents such as the European Green Deal (2019) and the Action Plan: Financing Sustainable Growth (2018), which set the objective of achieving climate neutrality by 2050, respectively redirecting capital flows towards sustainable investments, were followed in 2019 by the Regulation on sustainability reporting in the financial services sector and, in 2022, by the Directive on corporate sustainability reporting (CSRD).

This incremental change is evidenced, *inter alia*, by the frequency of the keywords 'sustainable' and 'sustainability' in European legislation related to taking environmental, social and governance requirements into account in the disclosure of information, as shown in **Table no. 1**.

⁴ Guibentif, P. (1979), "Les effets du droit comme objet de la sociologie juridique. Methodological reflections and research perspectives", *Travail CETEL* n° 8, Genève, Université de Genève, p. 33-34.

Table no. 1. The concept of sustainability in European legislation

Month/ Year	Legislative act	Word frequency		Syntagms that include the term 'sustainable' or 'sustainability' ¹
		Sustainable	Sustainability	
0	1	2	3	4
06.2013.	Directive (EU) 2013/34 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings	6	0	
10.2014	Directive 2014/95 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups	4	3	Sustainable growth Sustainability information Sustainability risks
03.2018	COM(2018) 97 final Action Plan: Financing sustainable growth	96	90	Sustainable finance Sustainable investment Sustainable growth Sustainable governance Sustainability information Supply chain
12. 2019	COM(2019) 640 final The European Green Deal	79	10	Sustainable growth Sustainable resource management Sustainable products Sustainable finance Sustainable investment Sustainable value chain
11. 2019	Regulation (EU) 2019/2088 on sustainability-related disclosures in the financial services sector	23	82	Sustainability information Sustainability risks Sustainable investment Negative impact on sustainability Sustainability factors Sustainability indices
06. 2020	Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment (Taxonomy)	142	44	Sustainability criteria Degree of environmental sustainability Sustainability indicators Sustainable investment Sustainability information Sustainability reporting standards
12.2022	Directive (EU) 2022/2464 as regards corporate sustainability reporting	41	684	Sustainability information Sustainable investment Sustainable finance Sustainable growth Sustainable economic and financial system Value chain (frequency = 22) Sustainability reporting standards
02.2022	Proposal for a Directive of the European Parliament and of the Council on corporate sustainability due diligence	51	50	Sustainability due diligence Sustainability information Sustainability factors Sustainability indicators Sustainability of governance systems Value chain sustainability (syntagm frequency = 54)

Source: The authors

¹ Except for expressions commonly used in all areas: sustainable development, sustainable economy, sustainable future, sustainable strategies, sustainable management, sustainable policies.

According to the elements presented in **Table no. 1**, it can be seen that in the older directives, the 2013 Accounting Directive and the 2014 Non-Financial Reporting Directive, the words 'sustainable' and 'sustainability' are very little used. Since 2018 and especially after the crises associated with the Covid 19 pandemic, the two terms have become the reference point of legal devices, as an expression of awareness of the gravity and urgency of finding solutions to environmental and social problems facing human society. Thus, for example, the word 'sustainability' is used 684 times in the recent Directive (EU) 2022/2464 and only three times in Directive (EU) 2014/95. Also, gradually the syntagms that include these terms increase their frequency or new syntagms such as 'sustainability factors', 'sustainability criteria', 'sustainability of the value chain', 'sustainability vigilance' appear, with an information load of major conceptual and empirical interest.

2.4. A change of syntagm in line with the new European legal framework

Table no. 1 (column 4) summarizes the main syntagms that appear in European regulations on sustainable development, such as: sustainable growth, sustainable finance, sustainable investments, sustainability of governance systems, sustainable value chains, sustainability factors, sustainability indicators, sustainability due diligence, etc. Beyond the formal, natural coherence of 'sustainability information' with the other terms that make up the European conceptual framework on sustainability, there is also consistency in terms of content.

Thus, in March 2018, the European Commission stressed in its communication on *the Action Plan for Financing Sustainable Growth*¹, the need for urgent action to adapt public policies to current realities, marked by the negative effects of climate change and resource depletion. The Commission rightly started from the idea that the financial sector has a key role to play in promoting the ecological transition, which it can assume thanks to its position as an intermediary between users and capital providers. The

three objectives of the plan² were broken down into ten flagship measures³, which were subsequently implemented in a significant number of directives, regulations and delegated acts. Directive (EU) 2022/2464 gives concrete expression to the 9th measure adopted in this plan, the implementation of which must enable "investors and stakeholders to assess companies' long-term value creation and their sustainability risk exposure"⁴. The definition of 'sustainable finance' in the *Action Plan: Financing Sustainable Growth*, as "the process of taking due account of environmental and social considerations in investment decision-making"⁵, is conceptually fundamental. This process must respond to two priorities: improving the contribution of the financial system to sustainable and inclusive growth by financing society's long-term needs, and strengthening financial stability by integrating environmental, social and governance (ESG) factors into investment decision-making.

At operational level, channeling capital towards sustainable investments is essential for the success of European commitments, as access to finance is a major barrier to sustainable investment by companies, especially small and medium sized entities (SMEs). According to a survey conducted by the European Investment Bank,

² *Idem*, p. 3: "1. reorient capital flows towards sustainable investment in order to achieve sustainable and inclusive growth; 2. manage financial risks stemming from climate change, resource depletion, environmental degradation and social issues; and 3. foster transparency and long-termism in financial and economic activity."

³ *Idem*, p. 18-20:

- i. establishing an EU classification system for sustainable activities;
- ii. create standards and labels for green financial products;
- iii. fostering investment in sustainable projects;
- iv. incorporating sustainability when providing financial advice;
- v. developing sustainability benchmarks;
- vi. better integrating sustainability in ratings and market research;
- vii. clarifying institutional investors' and asset managers' duties;
- viii. incorporating sustainability in prudential requirements;
- ix. strengthening sustainability disclosure and accounting rule-making;
- x. fostering sustainable corporate governance and attenuating short-termism in capital markets.

⁴ *Idem*, p. 12.

⁵ *Idem*, p. 3

¹ COM(2018) 97 final, Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, to the European Economic and Social Committee and the Committee of the Regions: *Action Plan: Financing Sustainable Growth*.

28.3% of SMEs in the EU face such difficulties, as well as 31.7% of small and micro enterprises.¹

According to the European Commission, "[a] lack of clarity among investors regarding what constitutes a sustainable investment is a contributing factor behind this investment gap and also an obstacle to financing the social infrastructure that is needed to address inequality and inclusiveness issues"². Despite this warning, this Communication does not provide the definition of sustainable investment. It will be developed a little later, in relation to other key concepts (sustainability factors, sustainability risk), in Regulation (EU) 2019/2088, which requires disclosure of specific sustainability-related information by companies active in the financial services sector. The purpose of this regulation is to lay down "harmonized rules for financial market participants and financial advisers on transparency with regard to the integration of sustainability risks and the consideration of adverse sustainability impacts in their processes and the provision of sustainability-related information with respect to financial products."³

Thus, "'sustainable investment' means an investment in an economic activity that contributes to an environmental objective (...) or (...) a social objective (...) provided that such investments do not significantly harm any of those objectives and that the investee companies follow good governance practices"⁴. Environmental objectives must be measurable through the use of key indicators relating to resource efficiency (energy, raw materials, water, land), waste production and greenhouse gas emissions, or impacts on biodiversity and the circular economy. As regards social objectives, the regulation aims to combat inequalities, strengthen social cohesion, social integration and industrial relations, invest in human capital or economically or socially disadvantaged communities. The value of the investment shall be addressed in relation to

sustainability risk, defined as "an environmental, social or governance event or condition that, if it occurs, could cause an actual or a potential material negative impact on the value of the investment."⁵

The implementation of the mechanisms mentioned above and the orientation of capital flows towards sustainable investments also required the definition and a common understanding of the concept of 'sustainable', i.e., the criteria for classifying and identifying sustainable activities. It was at the heart of the most important and urgent actions in the Action Plan to finance sustainable growth. The clarification on the above issues was provided by Regulation (EU) 2020/852, known as the 'Taxonomy' Regulation, which "establishes the criteria for determining whether an economic activity qualifies as environmentally sustainable for the purposes of establishing the degree to which an investment is environmentally sustainable."⁶ It contains basic definitions for 'environmental sustainability' in the EU and sets out harmonized criteria for qualifying an activity as 'sustainable'. The Taxonomy Regulation also amends the reporting requirements for companies, which must report, by means of measurable and verifiable indicators, how and to what extent their activities are environmentally sustainable.

The legislator returns to the definition of environmentally sustainable investment, specifying that 'environmentally sustainable investment' is an investment in one or more economic activities that can be considered environmentally sustainable.⁷ Therefore, the sustainability of the investment is conditional on the sustainability of the economic activity in which it is invested. According to the Taxonomy Regulation, "an economic activity shall qualify as environmentally sustainable where that economic activity (...) contributes substantially to one or more of the environmental objectives (...) does not significantly harm any of the environmental objectives"⁸ and is carried out in

¹ Commission Européenne (2022), *Annual Report on European SMEs 2021/22, SMEs and environmental sustainability, SME Performance Review 2021/2022*, p. 79-90

² COM (2018) 97 final, Communication from the Commission to the European Parliament, the European Council, the Council, the Council, the European Central Bank, to the European Economic and Social Committee and the Committee of the Regions: Action Plan: Financing Sustainable Growth, p. 4

³ Regulation (EU) 2019/2088 of the European Parliament and of the Council on sustainability-related disclosures in the financial services sector, Art. 1.

⁴ *Idem*, Art. 2 (§ 17)

⁵ *Idem*, Art. 2 (§ 22)

⁶ Taxonomy Regulation, Art. 1.

⁷ *Idem*, Art. 2 (§1)

⁸ See Article 9 of the Taxonomy Regulation: "For the purposes of this Regulation, the following shall be environmental objectives: (a) climate change mitigation; (b) climate change adaptation; (c) the sustainable use and protection of water and marine resources; (d) the transition to a circular economy; (e) pollution prevention and control; (f) the protection and

compliance with the minimum human and fundamental rights safeguards¹. Of the six environmental objectives, only the first two, climate change mitigation and adaptation, are subject to a delegated regulation² specifying the content of information to be published by different financial and non-financial actors. As we have seen, in this regulation 'sustainability' is limited to environmental matters, while in Regulation (EU) 2019/2088, sustainability is addressed in a broader vision, that is "environmental, social and employee matters, respect for human rights, anti-corruption and anti-bribery matters."³

Given the concepts circulated and the magnitude of the implications of these legislative devices, changing the syntagm 'non-financial information' to 'sustainability information' gives coherence to the European conceptual framework, making the interconnections between different European legal acts clearer and more operational.

2.5. A change of syntagm in line with the UN 2030 Agenda

The change is also conceptually coherent with the international declarations on sustainable development⁴ and international commitments under the 2030 Agenda adopted by the UN General Assembly in 2015. The

restoration of biodiversity and ecosystems." See also Art. 2 (§5), (§6).

¹ *Idem*, Art. 3 and Article 18

² Commission delegated regulation (EU) 2021/2178 of 6 July 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and presentation of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive 2013/34/EU concerning environmentally sustainable economic activities, and specifying the methodology to comply with that disclosure obligation. Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.

³ Regulation (EU) 2019/2088, Art. 2 (24)

⁴ UN, Resolution of 25 September 2015 "Transforming our world: the 2030 Agenda for Sustainable Development"; The United Nations Framework Convention on Climate Change of 12 December 2015 (Paris Agreement), etc.

publication by certain categories of companies of relevant, comparable and reliable sustainability information ensures better monitoring and transparency of progress made at the European and international level towards achieving the proposed objectives. The obligation for companies to extend the scope of disclosure and the proposal for new instruments for measuring and assessing sustainability will lead to the achievement of certain objectives, in particular targets 5, 10, 12, 13⁵. The Commission's top proposal on classifying activities according to their potential to contribute to environmental objectives (i.e., the 'Taxonomy') makes it possible to position companies' activities on the path of sustainable transition and orient financial flows towards priorities defined by the European and international community.

3. New relationship between rules of law and social reality created by Directive (EU) 2022/2464

The relationship between the legal system and the social reality in which it operates can be approached from three perspectives: legality, legitimacy and effectiveness⁶.

In the spirit of the Enlightenment, 'legality' is associated with freedom, rationality, and the role of the state in ensuring security, freedom and equality between people. In European law, where "there is no law in the sense of expressing the will of the sovereign people, European legality is therefore essentially jurisdictional legality (...) which is explained by the competence (mainly economic) and the sui generis institutional architecture of the European Community⁷. European legality "operates by respecting, under the supervision of a court, a network, an archipelago of principles".⁸ It is measured by compliance with the substantive principles and values that guide actions.

⁵ Gender equality, Reducing inequalities, Sustainable consumption and production, Climate action.

⁶ Mincké, Ch. (1998), "Effets, effectivité, efficacité et efficacité du droit: le pôle réaliste de la validité", *Revue interdisciplinaire d'études juridiques*, Vol. 40, p. 115-151

⁷ Slingemeyer, T. & Vogliotti M. (2019), *The New Paths of Legality. Au-delà de la modernité juridique*, Brussels, Presses de l'Université Saint-Louis, p. 275-281.

⁸ *Ibid.*

As for 'legitimacy', it is generally associated "with that which conforms, not only to laws, but also to morality, reason."¹ Etymologically, legitimacy is "the characteristic of what is grounded in law and/or justice". It therefore refers only to "those things which may be the subject of debate from the point of view of law or justice, namely, essentially, human actions, insofar as they take place in a social context defining acceptable and unacceptable, conforming and non-conforming, convenient and inconvenient norms"².

'Effectiveness' refers to the effects of the law "determined by itself and by the way in which it is implemented"³, regardless of whether these materialize through changes in the actors' practices or their representations. The effectiveness of the law also refers to the effectiveness and efficiency of rules and regulations, since, once identified, their effects must be assessed. The shift from non-financial to sustainability information implies new relationships between legal rules and social reality, both at the level of actors' representation and the modification of their practices and effectiveness, as we will see below.

3.1. Pillars of the new sustainability legal framework

Economic and social reality is a complex and dynamic set of interconnected facts and values. Interferences between legal norms and the functioning of the economy and society in general have always existed, because the law directs economic and social actors towards a certain type of action, generating at the same time certain constraints in their choices. The constraints have multiplied recently, in the context of the globalization of the economy, the increasing diversification of legal sources, the emergence of new environmental challenges and resource depletion, the widening of disparities and social problems, the diversification of the types of actors and often conflicting interest categories they represent. Therefore, the perimeter of the 'confrontation' between social reality and law has expanded considerably, aiming at: coherence between legal norms, social values and economic and social laws; the relationship between the objectives pursued by a legal text and the mobilized/mobilizable means to achieve them; the relationship between legal instruments and social needs to which these instruments

should respond, etc.⁴ This is also the perspective from which we analyze below the relationship between the rules of law and social reality, created by Directive (EU) 2022/2464 on sustainability reporting by companies. Such an approach opens the way to reflection and indirectly to innovative practices, since "law constitutes not only the armor of society, providing certainty to citizens (...), but also an instrument of progress: legislation not only ratifies morals, in many respects it arouses them".⁵

3.1.1. Axiological pillar

3.1.1.1. Compatibility with the fundamental values of the European Union

The provisions of Directive (EU) 2022/2464 are drafted in the spirit of respect for European principles and values with a universal purpose, respect for human rights, fundamental freedoms and democratic standards stemming from, in particular, the International Charter of Human Rights, the International Labour Organization Declaration on Fundamental Rights at Work, the European Social Charter, the Charter of Fundamental Rights of the European Union, etc.

It also gives concrete expression to the Commission's commitments under the *European Green Deal* to review the provisions of the Accounting Directive (EU) 2013/34 as amended by Directive (EU) 2014/95 on disclosure of non-financial information. This revision contributes to achieving the objectives of the *European Green Deal* of "building an economy that works for people and strengthening the Union's social market economy (...) and transforming the Union into a modern, resource-efficient and competitive economy with no net emissions of greenhouse gases (...) by 2050"⁶. Its implementation should increase companies' awareness of fundamental human rights and climate issues, motivate them to direct capital flows to those activities that comply with sustainability requirements, influence them in defining management and corporate governance priorities in decision-making, and lead to changing the behavior of all actors in the value chain.

¹ *Ibid.*

² Laufer, R., Burlaud, A. (2022), *Legitimité*, in Encyclopédie du management public, Open Edition Books, pp. 419 – 423

³ Mincké, Ch. *op. cit.* pp. 115-151.

⁴ Niculescu, M., Galabov, A. (2023), "The interpretation of the law of social economy: economic and sociological perspective", *Honorem, Brândușa Ștefănescu*, Bucharest, Ed. Hamangiu,

⁵ Legeais, R. (1973), *Clefs pour le droit*, Paris, Seghers, 1973, p. 143.

⁶ Directive (EU) 2022/2464, Whereas 1

The directive is drafted in accordance with classical European principles, particularly those of subsidiarity and proportionality. Thus, consistency of sustainability disclosure rules with other Union legislation can only be ensured by the Union. Also, compliance with the principle of proportionality allows determining the categories of companies subject to information obligations and the field of information to be disclosed, depending on the resources, capacities and complexity of their activities. Sustainability information must meet users' needs without imposing a disproportionate burden on companies covered by the Directive or indirectly affected as part of their value chain¹. Thus, SMEs benefit from simplified sustainability reporting obligations as well as longer deadlines for publishing the first sustainability report (2027, with the possibility to postpone to 2029), non-Union companies only have to provide information on their social and environmental impacts, not on their risks and opportunities, etc. This directive also promotes specific technical principles.

3.1.1.2. Double materiality principle

Directive (EU) 2022/2464 explicitly introduces the 'double materiality perspective' into corporate sustainability reporting obligations. That expression has been translated in the French version of the directive as "*double importance relative*" and in the Romanian language version as "*dubla perspectivă a pragului de semnificație*". The word "materiality" has in this context the same semantic connotation as: 'meaning', 'importance', 'relevance'.

In accounting, 'materiality' corresponds to the relevance of accounting information, to the fact that it is material². Article 2 (§16) of the Accounting Directive, in the Romanian version, implicitly defines the term 'semnificație', within the respective syntagm "prag de semnificație", as "*statutul informațiilor în cazul în care se poate anticipa în mod rezonabil că omiterea sau prezentarea eronată a acestora influențează deciziile pe care utilizatorii le adoptă pe baza situațiilor financiare ale întreprinderii (...)*"³. The French version uses the word 'significatif', similarly defined as "*le statut d'une information dont on peut raisonnablement penser que*

l'omission ou l'inexactitude risque d'influencer les décisions que prennent les utilisateurs sur la base des états financiers de l'entreprise".

Double materiality is a complex concept, the definition of which combines two perspectives to considering sustainability information in decision-making:

an 'outside-in' perspective, according to which only information on the positive and negative impact of the (economic, social, natural) environment **on the entity** is relevant and therefore must be taken into account. It is a perspective that considers the opportunities (positive impacts) and risks (negative impacts) of the company ("*financial materiality*") an 'inside-out' perspective, according to which information about the company's negative and positive impact **on the** (economic, social, natural) **environment** is also material ("*impact materiality*").

This approach is based on the theory of 'externalities', according to which externality (positive or negative) is by definition a gain or loss that one economic agent (individual or company) imposes on another (or others) outside the market, thus excluding compensation⁴. In this sense, externality refers to the notion of impact. For EFRAG (European Financial Reporting Advisory Group), the body entrusted by the European Commission with developing technical sustainability rules, 'materiality' should be understood as a criterion for including information in companies' management reports. This criterion reflects:

- the importance of the information in relation to the phenomenon it is supposed to describe or explain;
- the ability of information to meet the needs and expectations of stakeholders and the enterprise itself, enabling sound decision-making;
- and, more generally, the needs for transparency in the public interest⁵.

⁴ Perman, R., Ma, Y., McGilvray, J., & Common, M. (2003). *Natural resource and environmental economics* (3rd ed.). Pearson Education, citat de Rimbaud, A. et al. (2022) in *Papier de recherche: Mesure et définition d'impacts extra-financiers des investissements: retour des théories et pratiques de l'Impact Investing et apports possibles de la comptabilité*, ANC, Paris

⁵ EFRAG (2022), [Draft] *European Sustainability Reporting Guidelines 1 Double materiality conceptual guidelines for standard-setting*, p. 4 (<https://www.efrag.org/>, Accessed February 2022)

¹ *Idem*, Whereas 46

² Edgley, C. (2014), "A genealogy of accounting materiality". *Critical Perspectives on Accounting*, 25(3), p. 255-271.

³ Accounting Directive (EU) 2013/34, art. 2 (§16)

Therefore, the dual meaning is, in the sense given by EFRAG, a concept that provides criteria for determining whether or not a subject/theme or sustainability information should be included in the company's sustainability report. Double materiality must be understood as a combination, a symbiosis of the two forms of materiality (financial materiality and impact materiality). A sustainability topic or information fulfils the dual materiality criterion if it is significant in financial terms or in terms of its impact or both at the same time¹. This dual approach is of interest in decision-making, both for the reporting company and for all other stakeholders.

The perspective of the enterprise becomes visible in financial materiality, being an 'outside-in' perspective. An information is material (financial materiality) if it *"triggers financial effects on undertakings, i.e., generates risks or opportunities that influence or are likely to influence the future cash flows and therefore the enterprise value of the undertaking in the short, medium or long term but are not captured by financial reporting at the reporting date"*². Impact materiality is the perspective of other stakeholders, i.e., an 'inside-out' perspective. Sustainability information is material from an impact perspective *"if the undertaking is connected to actual or potential significant impacts on people or the environment"*.³

These meanings given by EFRAG are found in Directive (EU) 2464/2022, which requires companies to *"report both on the impacts of the activities of the undertaking on people and the environment, and on how sustainability matters affect the undertaking. That is referred to as the double materiality perspective"*.⁴ The same recital specifies the reporting obligation for situations where sustainability issues are significant from only one of two perspectives: *"It is therefore necessary to clarify that undertakings should consider each materiality perspective in its own right, and should disclose information that is material from both perspectives as well as information that is material from only one perspective."*⁵

The definition of financial materiality adopted by the European legislator is very similar to that proposed by EFRAG. Thus, an aspect of sustainable development is considered financially material if it triggers or is likely to

trigger significant financial effects on the development of the enterprise, including its cash flow and financial condition. In terms of impact materiality, the directive refers to *"actual or potential, positive or negative significant impacts of the company on humans or the environment in the short, medium or long term"*. These include both *"impacts directly caused by the undertaking"* or *"to which the undertaking contributes"* or *"are otherwise linked to the undertaking's value chain"* and commercial relationships. *Commercial relationships include the upstream and downstream value chain of the company and are not limited to direct contractual relationships*.⁶

Assessments of materiality of impact and financial materiality are interdependent and companies need to take them into account in their sustainability reporting. The application of this principle allows companies to identify from all impacts, risks and opportunities, those that are material and therefore need to be included in their sustainability reports. However, the provisions of the Directive do not clarify how to apply the principle of double materiality. Such clarifications are expected from the sustainability rules currently being developed by EFRAG.

3.1.1.3. Information on value creation: a new perspective of European regulations

Taking inspiration from the *UN Guiding Principles on Business and Human Rights*⁷, the new European directives create obligations for companies to report and due diligence on value creation. This orientation of corporate reporting towards value creation was developed and recommended by the International Integrated Reporting Council (IIRC)⁸ in the *International Integrated Reporting Framework*. Without defining value, IIRC focuses on the value creation process and advocates *"an approach that draws on diverse sources of information to reflect the full range of factors that have a significant impact on the organization's ability to create short, medium and long-term value for itself, stakeholders and society as a whole."*⁹

⁶ Directive (EU) 2022/2464, Whereas 31

⁷ www.ohchr.org, accessed March 2023

⁸ IIRC (International Integrated Reporting Council) is a global coalition of companies, investors, regulators, standards bodies, representatives of the accounting profession and NGOs promoting integrated reporting.

⁹ IIRC, *International Integrated Reporting Framework*, https://ceccar.ro/ro/wp-content/uploads/2021/09/3103_IIRC_framework_doc_8a-RO-FINAL.pdf, Accessed March, 2023

¹ *Idem*, p. 5

² *Idem*, p. 6

³ *Idem*, p. 5

⁴ Directive (EU) 2022/2464, Whereas 29

⁵ *Ibid.*

The European legislator takes the same approach, evoking value creation from two angles: that of the contribution of intangible resources to value creation and that of the value chain¹. Thus, Directive (EU) 2464/2022 introduces an obligation for undertakings to provide information on 'key intangible resources'² generated internally, in order to allow information users to better understand the undertakings' development, performance and position, as well as the growing gap between their book value and their market value. Information on the skills, competencies and experience of employees, loyalty to the company and the desire to improve processes, goods and services, as well as information on the quality of relations between the company and stakeholders are considered inseparable from development issues³. The Directive underlines the importance of information on research and development and the obligation for companies to base the information provided in their sustainability reports on scientific evidence.

The obligation to disclose information on sustainability matters as well as sustainability due diligence concerns not only the activities of the undertaking but also the entire value chain. Moreover, as can be seen from Table 1, there has been a gradual replacement of the term supply chain by that of value chain, cited 24 times in Directive (EU) 2464/2022⁴ and 54 times in the draft of the Directive on corporate sustainability due diligence⁵. This concept introduced in managerial theory by Michel Porter designates the set of activities located upstream or downstream of the enterprise (basic activities: internal and external logistics, production, marketing/sales, services and, respectively, support activities: infrastructure, human resources, research and development, purchasing) that influence its competitive advantage⁶.

The draft of the Directive on corporate sustainability due diligence defines a 'value chain' as: "*activities related to the production of goods or the provision of services by a*

company, including the development of the product or the service and the use and disposal of the product as well as the related activities of upstream and downstream established business relationships of the company"⁷.

Although the first part of the definition has a managerial connotation, it gradually moves away from it by including requirements covering the entire product cycle, from design to disposal, as well as adding requirements for including well-established business relationships of the company within the value chain. The legislator defines an 'established business relationship' as "*business relationship, whether direct or indirect, which is, or which is expected to be lasting, in view of its intensity or duration and which does not represent a negligible or merely ancillary part of the value chain*"⁸, without specifying thresholds for assessing the duration, intensity or non-negligibility of the relationship. These require the use of professional judgement⁹.

The new regulations obliging companies to inform about the value creation process and monitor their value chain from the point of view of human rights, environmental protection and labor standards are new in European legislation. There is no doubt that further clarification is needed on the concept and configuration of value chains, i.e., established business relationships, but also on the understanding and interpretation of companies' legal obligations.¹⁰ They are opening up new avenues for reflection for academia and research.

3.1.2. Teleological pillar

The main objective of Directive (EU) 2464/2022 is to harmonize and improve the availability and quality of information on the sustainability of undertakings. This objective is part of the concerns to reduce information asymmetry from the perspective of different stakeholders, to reduce power gaps and also the risks associated with them¹¹.

Disclosing quality, comparable, relevant and reliable sustainability information is beneficial for the reporting company as well as for all stakeholders: those with whom it does business, civil society organizations, citizens and society as a whole. Thus:

¹ Directive (EU) 2022/2464, whereas 31

² 'Essential intangible resources' are resources devoid of physical substance on which the company's business model fundamentally depends and which constitute a source of value creation for society, Directive (EU) 2022/2464, Article 1, point (1); (§19).

³ Directive (EU) 2022/2464, whereas 32

⁴ *Ibid.*

⁵ COM(2022) 71 final 2022/0051 (COD) Proposal for a Directive of the European Parliament and of the Council on corporate sustainability due diligence and amending Directive (EU) 2019/1937.

⁶ Porter, M. (1980), *Competitive strategy: techniques for analyzing industries and competitors*, New York, The Free Press; Porter, M. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*. New York, The Free Press.

⁷ COM(2022) 71 final 2022/0051, Art. 3, g.

⁸ *Idem*, Art. 3, f.

⁹ Burlaud & Niculescu: "An accountant right that appeals to professional reasoning: a threat or an opportunity for the accounting profession?" *Financial Audit* no. 144, December 2016, Bucharest, pp. 1267-1276.

¹⁰ Beckers A. (2021), "Chaînes de valeur mondiales: théorie et dogme des obligations de l'entreprise", *Revue internationale de droit économique*, vol. 4, t. XXXV.

¹¹ Hill, C.W. et Jones, T.M. (1992). "Stakeholder agency theory", *Journal of Management Studies*, vol. 29, pp. 131-134.

- investors, including asset managers, will be able to maintain and ensure, based on available information, increased financial flows towards activities qualified as sustainable;
- companies' business partners will be able to use this information to understand sustainability risks and impacts within their value chains;
- trade unions and employees' representatives will be better informed and more appropriately involved in social dialogue;
- civil society actors will be better aware of the impact of business activities on people and the environment;
- environmental agencies will be better able to monitor social and environmental trends;
- individuals and investors will have useful information to invest in line with their beliefs on sustainable development.

Such information will also be useful to policy makers in designing and implementing public policies, respectively in substantiating their economic, social and environmental decisions. These mechanisms for publishing, disseminating and using sustainability information should contribute to the evolution of social economic realities towards a stable, sustainable and inclusive system that benefits all.

3.1.3. Accountability¹ pillar

New European regulations increase companies' responsibilities for their impact on the environment and fundamental rights, as well as those for sustainability due diligence. Do companies need to disclose a variety of sustainability information beyond the obligations laid down in Directive (EU) 2014/95, being responsible for their content and obligated to be accountable to interested parties for their decisions and actions. Their responsibility is substantively increased, but also in terms of scope, nature and content of information, as well as its clarity, quality and presentation form.

Companies falling within the scope of Directive (EU) 2022/2464 must include in their management report information in accordance with European sustainability reporting standards, which will be adopted by the Commission by June 30, 2023, and June 30, 2024, respectively, for SMEs and third-country companies.² The reporting obligation covers quantitative and qualitative,

prospective and retrospective information, including, where appropriate, short, medium and long-term horizons. Companies shall be required to publish the sustainability report as an integral part of the management report within a reasonable period not exceeding twelve months from the balance sheet date. This ensures that sustainability information is linked with financial information, facilitating correlations and analyses useful for decisions. In terms of various actors' representation, the integration of sustainability information into the management report can have a positive significance as it is considered to have the same relevance for reporting companies. Companies must comply with the requirement to publish in a single electronic format, which will allow for more efficient exploitation of information but also lower costs for all stakeholders. Directive (EU) 2022/2464 introduces new responsibilities for ensuring annual and consolidated sustainability information (see paragraph 4). Management and governance bodies have a collective responsibility to ensure that the company has published sustainability information in line with European standards and in the required digital format³. In addition, the sustainability report should include a description of the role of administrative, management and supervisory bodies with regard to sustainability issues and a description of their expertise and skills in exercising their role, or the opportunities to acquire such expertise or skills⁴.

3.1.4. 'Substantive' pillar⁵

In order to meet the information needs of all stakeholders, sustainability reporting, based, as seen above, on the principle of double materiality and the conceptual approach of EFRAG, can be structured three-dimensionally, as illustrated by **Figure no. 1**:

- level of information: cross-sector information (sector agnostic⁶), sector-specific information, company-specific information;

³ *Idem*, Whereas 59.

⁴ *Idem*, Whereas 50.

⁵ The term 'substantive' ('*substantiel*'; Fr.), of Latin origin, '*substantialis*', means "*rich in content, consistent, full of substance, abundant*". Source: Larousse.

⁶ The word 'agnostic' used in the EFRAG standards has a particular, contextual meaning denoting 'all sectors'. According to the dictionary of the French Academy, 'agnostic' means: "a philosophical doctrine or attitude which considers illegitimate any metaphysical doctrine and declares inaccessible to knowledge any reality that cannot be perceived by the senses." By extension, it means "indifference in religious matters".

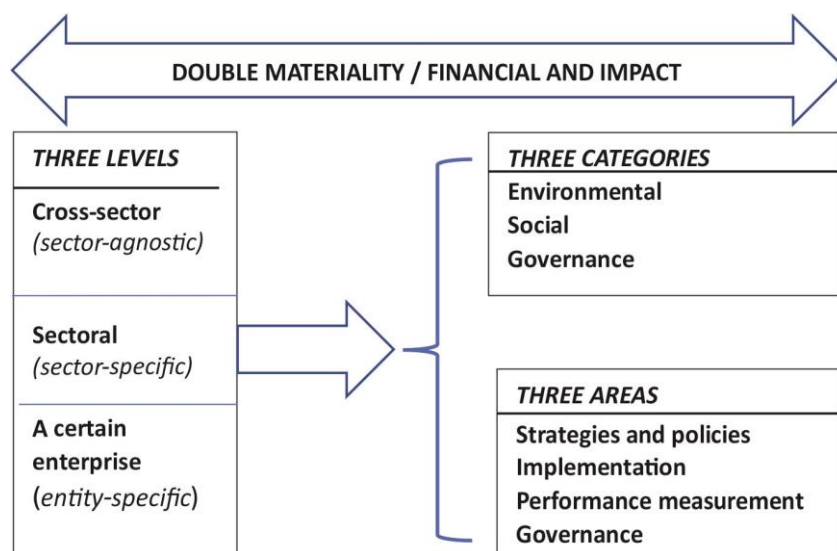
¹ The term 'accountability' ('*redevabilité*'; Fr.) means that enterprises, through their representative bodies, must be accountable for their decisions and actions.

² Directive (EU) 2022/2464, § 4.

- ii. Sustainability matters/Information topics: environmental, social, governance;
- iii. Information areas: strategy and policies, implementation, performance measurement.

This approach anticipates the multidimensional substance of information, in line with the expectations and needs of different users and an increasingly complex and dynamic reality.

Figure no. 1. Sustainability reporting architecture



Source: Authors, inspired by ESRS presentation – Outreach France

3.2. The social reality covered by the new European legal framework

Compared to voluntary or non-financial reporting, Directive (EU) 2022/2464 contains additional information requirements to represent the complex reality of undertakings operating in a socially and environmentally binding context.

The reality envisaged by this directive can be approached from two points of view:

- the perimeter of entities subject to this obligation;
- the content of the information, matters considered significant from the point of view of sustainability.

3.2.1. The scope/perimeter of sustainability reporting

The perimeter of sustainability reporting means, in this context, outline of the scope of the obligations imposed by

Directive (EU) 2022/2464. It depends both on the reporting entities directly subjected to disclosure obligation (for financial reporting purposes), and on the risks, opportunities and outcomes related to other stakeholders concerning sustainability issues. Directive (EU) 2022/2464 contains radical changes to the reporting perimeter compared to the Non-Financial Information Directive. As shown in Annex 1, sustainability reporting obligations cover:

- i. *All large companies*, regardless of whether they are listed on a European regulated market or not, given their significant impact on sustainability factors, both directly and along their value chains. According to estimates², only 20% of large enterprises currently apply the standards in this area, and only 30% of them require some form of audit assurance. This

¹ ESRS Presentation – Outreach France, June 2, 2022, EFRAG, <https://www.efrag.org/> (accessed September 2022)

² Proposal for a Directive of the European Parliament and of the Council amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC and Regulation (EU) No 537/2014, as regards corporate sustainability reporting. Explanatory memorandum, p. 10.

change will lead to an important increase in the scope/perimeter of sustainability reporting: from currently 11,600 companies (or 47% of the turnover of all listed companies), to approximately 49,000 companies (representing 75% of the same turnover).¹

- ii. *All companies, European and non-European, listed on a regulated market in the Union (both large undertakings and SMEs), except for micro-enterprises.* The inclusion of listed SMEs is justified, firstly, by their high proportion in the total European companies and, in this case, in the total listed ones. According to the Commission's latest report² on SMEs (enterprises with less than 250 employees), SMEs accounted for 99.8% of all non-financial enterprises in the EU-27 in 2021. They employed 83 million people, equivalent to 64% of total employment, and generated 52% of the total value added produced by the non-financial business sector. Micro-enterprises (enterprises with less than 10 employees) accounted for more than 90% of all SMEs. This requirement to disclose sustainability information will provide financial market participants with the necessary information for their own approach to sustainability, while opening up new avenues for access to finance for the SMEs concerned.
- iii. *Credit institutions, investment firms and insurance and reinsurance undertakings, including cooperatives and mutual societies* that meet certain size criteria, given their key role in the transition to a fully viable and inclusive economic and financial system.³
- iv. *Third-country undertakings* with significant activity and which have a subsidiary or a branch within the Union. This obligation makes third-country companies responsible for their impact on humans and the environment, while ensuring a level playing field for companies operating in the internal market.

¹ According to Eurostat, in 2021, the number of large enterprises in Romania was 1,540 and that of SMEs was 530,050. In France, there are 4,723 large enterprises and 2,939,143 entities SMEs; <https://ec.europa.eu/eurostat/>, accessed May 2023.

² European Commission (2022), Annual Report on European SMEs 2021/2022. SMEs and environmental Sustainability. *SME Performance Review 2021/2022*, p. 9.

³ Directive (EU) 2022/2464, Whereas 27.

The extended reporting perimeter is a prerequisite for providing stakeholders with better access to comparable, relevant and reliable sustainability information

3.2.2. Content of sustainability information

The transition from non-financial to sustainability information takes the administrative form of replacing the *non-financial statement* required by Directive (EU) 95/2014 with *sustainability reporting* required by Directive (EU) 2022/2464.

The deadlines for publishing the first sustainability report differ depending on the categories of entity and their origin⁴. According to Directive 2022/2464, *the list of sustainability matters*⁵ on which undertakings are required to disclose information should be consistent with the definition of 'sustainability factors'⁶, to prevent any inconsistencies between the information required by users and information published by companies, and should also correspond to the needs and expectations of users and companies.

The information to be published reflects the interaction between the company, on the one hand, and the impact, risks and opportunities related to sustainable development, on the other. They must enable an understanding of the impact of the undertaking's activities on sustainability matters and how they influence the development, performance and position of the undertaking beyond what is already reflected in the financial statements.

⁴ **2025** for the financial year beginning January 1, 2024 for undertakings already subject to Directive (EU) 2014/95; **2026** for the financial year beginning January 1, 2025 for large undertakings not currently subject to Directive (EU) 2014/95; **2027** for the financial year beginning on January 1, 2026 for listed SMEs, with the possibility of delay until 2029; **2029**, for the financial year ending January 1, 2028, for third-country undertakings with a net turnover exceeding EUR 150 million in the EU. Source: Directive (EU) 2022/2464, art.5.

⁵ 'Sustainability matters' refer to environmental, social and human rights, and governance factors, and also incorporate the definition of the term 'sustainability factors' as defined in point (24) of Article 2 of Regulation (EU) 2019/2088 (Source: Directive (EU) 2022/2464, Whereas 28).

⁶ 'Sustainability factors' means "environmental, social and employee matters, respect for human rights, anti-corruption and anti-bribery matters" (Source: Regulation (EU) 2019/2088, Article 2 (§24)).

In order to define sustainability information requirements, topics/themes are divided into sub-topics/themes (and, if necessary, sub-sub-topics), leading, step-by-step, to a coherent set of information, following the logic shown in **Figure no. 1**. **Annex 2** summarizes the relevant information to be reported, through a comparative presentation of the requirements of the two directives, in order to better highlight the progress envisaged by Directive (EU) 2022/2464, but also the obligations incumbent on businesses.

Without proposing to develop all the matters mentioned in **Annex 2**, we will mention only some significant differences between the two directives, grouped according to the case, by reporting areas or matters (see **Figure no. 1**). Thus, in accordance with the principle of double materiality, the information to be reported under Directive (EU) 2022/2464 relates, on the one hand, to the impact of the undertaking's activities on sustainability matters and, on the other hand, to how sustainability matters affect the development, performance and position of the undertaking. They are further analyzed from three angles: opportunities, risks and impacts related to sustainability matters.

The recent Directive requires information not only to be provided on the business model, but also on the *company's sustainability strategy*. The classic approach of developing a strategy needs to be reviewed, as companies are forced to integrate new variables on opportunities related to sustainability factors, associated risks, resilience of their business model and to disclose the arguments for their strategic choices. They must also report on how to integrate sustainability considerations into business plans, both operating and financial. Another innovative aspect relates to the obligation to inform on how to include essential intangible resources in the strategic options, beyond the matters reported in the financial statements, as well as on the level of dependence on this type of resources: intellectual, human, social and relational capital, research and development resources.

The formulation of objectives related to sustainability matters must meet the classical requirements of management science, in terms of measurability and deadlines for achievement. Added to this are additional requirements, as targets must be set in line with European environmental commitments¹ and taking into account the

objectives undertaken by the European institutions and the international community under the UN 2030 Agenda. A novelty that should increase the relevance of objectives, especially those related to environmental factors, but also the responsibility of companies, relates to the obligation to report information based on conclusive scientific evidence². In addition, undertakings are obligated to provide a statement as to whether objectives related to environmental factors are based on such scientific evidence.

Information on the business model and strategy should also include elements on the quality of the relationship between the company and stakeholders, including customers, suppliers and communities affected by its activities, and on how they are involved in developing and implementing the strategy. Integrating risk³ into an enterprise's strategy is normal. It acquires new dimensions in the context of sustainable development as the company must take into account and provide information on: its financial risks arising from sustainability matters; risks and impacts arising from business activities (impact directly caused by the undertaking, impacts to which the undertaking contributes and impacts otherwise linked to the company's value chain); resilience of the company to sustainability risks.

The company must provide information on the *implementation of the sustainability strategy*, action plans, concrete actions taken, financial and associated investments. The information should also cover sustainability due diligence understood as *"the process that undertakings carry out to identify, monitor, prevent, mitigate, remediate or bring an end to the principal actual and potential adverse impacts connected with their activities and identifies how undertakings address those adverse impacts"*⁴. Sustainable development due diligence is an ongoing practice that responds to changes in company strategy, business model and relationships, operation, sourcing and sales conditions.

In line with the management principle, *'what cannot be measured cannot be controlled'*, European provisions on sustainability, in particular the Taxonomy Regulation and delegated regulations

¹ COM(2019) 640 final: The European Green Deal; Taxonomy Regulation, art. 9.

² True statements obtained by applying rigorous scientific methods.

³ Defined by ISO 31000 Risk Management-Guidelines, as "The effect of uncertainty on objectives".

⁴ Directive (EU) 2022/2464, Whereas 31.

mentioned above, but also Directive (EU) 2464/2022 pay particular attention to the measurability of objectives, progress made and results achieved. These documents contain precise, scientifically based technical criteria for classifying companies' activities in terms of sustainability, as well as techniques for measuring their environmental performance.

For example, to measure environmental sustainability, non-financial undertakings must disclose the following indicators:¹

- the proportion of their turnover/sales from products or services associated with economic activities which can be considered environmentally sustainable (...);
- the part of their capital expenditure and the part of their operating expenditure linked to assets or processes associated with economic activities that can be considered environmentally sustainable (...).

Indicators relevant to social and governance issues largely relate to the issues mentioned in Annex 2, which we do not intend to develop in this article.

The provision of this information associated with its assurance by an auditor is a guarantee of compatibility of the strategy, business model and overall activities of the enterprise with the requirements of the transition to a sustainable economy.

4. New challenges for financial analysts and auditors

The new European regulations on sustainability reporting raise many concerns among theorists and practitioners, either from accounting and financial professions (accountants, asset managers, analysts, auditors) or other professions involved in the management and governance of companies. They all face new challenges, which are gradually taking shape and of which magnitude will be clearer with the adoption by the Commission of delegated acts supplementing Directive (EU) 2022/2464 with sustainability reporting standards ².

¹ Taxonomy Regulation, Art. 8.

² The Commission will adopt all delegated acts supplementing EU Directive 2022/2464 defining reporting standards no later than June 30, 2024 (according to points 8 and 14 of the directive).

4.1. New challenges for financial analysts

The accounting professions have evolved over time under the impetus of financial paradigms, which naturally expanded from finance to accounting and financial analysis. Spremann identified two major financial paradigms that synthesize this evolution: the 'traditional' paradigm and the 'neoclassical' paradigm³. According to the traditional paradigm, finance is simply a means to bring money into the real economy, to allocate savings to households and businesses with the expectation of a gain. Financial analysis focuses in this case on the efficient management of available funds and the ability to repay them (analysis of financial structure, analysis of liquidity and solvency, analysis of resources and profit, etc.). The neoclassical paradigm that has dominated economic life since the second half of the twentieth century is based on the assumption of an efficient, fully competitive financial market, capable of producing an equilibrium price representing the intrinsic economic value of financial assets. 'Finance' is no longer primarily focused on financing companies, but on creating value for shareholders. Financial analysis focuses in particular on the financial performance of the company, in terms of maximizing dividends and market value of the enterprise, respectively on reducing risks for shareholders.

Despite the obvious differences between the two paradigms, neither responds to today's demands and priorities because it ignores the challenges of sustainable development. The theory of sustainable finance is gaining ground, being transposed at accounting level by the CARE model (*Comprehensive Accounting in Respect of Ecology*)⁴, with extension in the field of analysis. This model represents a conceptual step forward, proposing the integration of a new function of capital used for value creation, the prevention function, alongside the traditional operating function. This approach is based on an expansion of the traditional accounting paradigm, in line with sustainability requirements and allowing for a reorientation of funds towards sustainable activities. In this context, analysts

³ Spremann, K. (2010). "Old and New Financial Paradigms". In G. Eilenberger, S. Haghani, A. Kötzle, K. Reding, & K. Spremann (Eds.), *Current Challenges for Corporate Finance: A Strategic Perspective*, (p. 7–26).

⁴ Rambaud, A. *et al.* (2022), "Mesure et définition d'impacts extra-financiers des investissements : retour des théories et pratiques de l'Impact Investing et apports possibles de la comptabilité", Paris, ANC, p. 41.

face new challenges, some of which are highlighted below.

4.1.1. Acknowledging the need to change the analyst's profession

Beyond the societal challenges faced by all professions, analysts face technical challenges as expanding reporting obligations profoundly changes the core of the profession. Far from being a simple profession, it is nevertheless facilitated by a number of elements:

- virtually all data is expressed in the same unit of measurement, the monetary unit, which facilitates processing; everything is calculable, measurable, reducible to the same monetary unit;
- the priority of figures over literary expression allows for a strong standardization of content, increased verifiability, giving a sense of scientificity, and therefore of truthfulness;
- the basic ideology is simple: the function of the company is to maximize its profit, provided that a positive cash flow is ensured.

This simplicity is relative. If we consider the case of TotalEnergies, its universal registration document for the financial year 2022, filed on the website of the Autorité des marchés financiers (AMF), contains 672 pages! The consolidated accounts number 130 pages and the social accounts 28 pages. In total, the financial part represents 1/4 of the volume of the annual report. But 300 pages are devoted to risk control, governance and extra financial performance. In these 300 pages, there is, of course, data that can be verified by linking them to financial information, but most of it consists of text, which allows for a holistic approach, a global diagnosis, with infinitely greater freedom of interpretation, which explains why independent third parties auditing this information are allowed to give only limited assurance.

Addressing societal issues, sustainability information, although often qualitative in nature, can be more relevant than financial information. Indeed, ensuring high profitability in the short term can lead to a medium- or long-term catastrophe, which the financial statements will not disclose. In addition, some human or social values cannot be measured. The abolition of the death penalty or slavery was not the result of an accounting or financial calculation, but of the prevalence of a certain idea about the human being. Similarly, maintaining natural or human capital is a political choice, but one to which analysts can

contribute by giving a different perspective to their job. All these aspects are examples of the evolution of the profession and of the need for change by enriching skills and quickly mastering the core of knowledge that is reconfiguring before our eyes.

4.1.2. Making financial analysis a tool for sustainable transition

European sustainability regulations make it mandatory for the accounting profession in general and financial analysts in particular to include new topics and benchmarks in their field and professional judgement. This is primarily about *broadening the scope of the analysis* in line with the new reporting requirements. Basically, the perimeter of the analysis should be extended to the sustainability matters and areas retained in **Annex 2** (column 2). Enlargement should not be understood as a quantitative accumulation of new themes, but as a way of a systemic approach, capable of connecting sustainability and financial matters. The analysis is no longer limited to matters under the control of the enterprise, but includes significant activities, risks and opportunities attributable to business relationships with other stakeholders beyond the scope of financial reporting. *The value chain*, which is currently given more or less attention, depending on the author, must become a transversal axis of analysis, being indispensable in formulating professional reasoning and bridging the gap between traditional financial analysis and sustainability analysis.

Traditional analysis oriented towards enterprise results and market values in terms of 'outputs' must naturally be complemented by analysis in terms of 'outcomes' and long-term impact. The methodological tools will be enriched with new grids for analyzing resources, activities and products, but also expenses and revenues. For example, resource analysis can be complemented by including matters of access to natural and social resources, sustainability of access and access conditions, opportunities and associated risks. The analysis of intangible resources, beyond purely financial considerations, must be complemented by the approach imposed by the new rules of the game.

An area that will gain a special magnitude is that of analyzing the position of the enterprise on the trajectory of sustainable transition, according to the requirements of the Taxonomy Regulation. Deepening the analysis by categories of activities: analysis of eligible activities in terms of taxonomy, analysis of the alignment of eligible activities and analysis of

the contribution of aligned activities to the overall activity of the enterprise (based on the indicators: share of turnover/sales of eligible and/or aligned activities; share of capital expenditure related to eligible and/or aligned activities; share of operating expenses related to eligibles and/or aligned activities) are already part of the practice of consulting firms and large groups.

The European Green Deal underlines that sustainable and inclusive growth “will require massive public investment and increased efforts to direct private capital towards climate and environmental action”¹. This allocation of resources relies heavily on the work of analysts who connect businesses and investors and can steer capital, as “[t]he private sector will be key to financing the green transition”². By giving their profession such a direction, analysts can help focus investments on sustainable activities and gradually transform financial analysis and the financial system in general into a tool to support the sustainable transition.

4.1.3. Reducing complexity through the use of credit rating agencies

Management reports, which sometimes contain hundreds of pages, exceed, by their level of technicality, the complexity of the meanings given to different concepts, the accounting, legal and financial skills of almost all investors. This has caused financial rating agencies to fill the gap and compensate for such difficulties by providing a rating, a grade, which alone sums up the whole. It does not concern itself with nuances. One company = one note!³ Resulting from an algorithm that is unknown, the credibility of this grade, which measures the entity's ability to repay its debts, is based on the agency's reputation. On the same model, ESG rating agencies were established. One of the largest in France, created in 2002 to promote socially responsible investment (SRI), is Vigeo, which has now become a subsidiary of the US rating agency Moody's.

One can, of course, criticize the value of these ratings. Their method of calculation is a well-kept 'kitchen secret'. Credit rating agencies are not a model of transparency, but they legitimately do not want their trade secrets to fall into the public domain. However, it seems that large groups have realized the demands of their social and

environmental responsibility and have contributed to a very strong increase in the amount of capital managed from socially responsible funds. Even if they do not know such internal secrets closely, financial analysts must be able to make sense of these ratings, interpret them, and channel such 'complexity reduction' into fueling their professional reasoning. The recent proposal of the European Parliament and the Council regarding the transparency and integrity of ESG rating activities will undoubtedly generate radical changes in the field⁴.

4.2. New challenges for auditors

Directive (EU) 2022/2464 regarding corporate sustainability reporting also amends Regulation (EU) 537/2014 regarding statutory audit of public-interest entities⁵ and Directive 2006/43/EC on statutory audit of annual and consolidated accounts⁶. An important change concerns the obligation of auditors to ensure that sustainability information is credible and therefore performative. The change in the title of Chapter 8 of the Accounting Directive from 'Auditing' to 'Auditing and assurance of sustainability reporting' is significant. Experience gained since 1978, when the first Statutory Audit Directive was published, has been fully used to address statutory audit with regard to sustainability. This innovation brings new responsibilities and opportunities for auditors, the most significant of which we highlight below.

4.2.1. Extension of audit' scope and auditors' responsibilities

In line with the requirements of Directive (EU) 2022/2464, statutory auditors and audit firms (licensed to carry out

¹ COM(2019) 640 final: The European Green Deal, p. 2.

² *Idem*, p. 16.

³ Burlaud A. (2022), *Comptabilités. L'empire des nombres*. EMS, p. 173.

⁴ Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, of 13. 06.2023, on the transparency and integrity of Environmental, Social and Governance (ESG) rating activities {SEC(2023) 241 final} – {SWD(2023) 204 final} – {SWD(2023) 207 final}

⁵ Regulation (EU) 537/2014 of the European Parliament and of the Council of 16 April 2014 on specific requirements regarding statutory audit of public-interest entities and repealing Commission Decision 2005/909/EC.

⁶ Directive 2006/43/EC of the European Parliament and of the Council of 17 May 2006 on statutory audits of annual accounts and consolidated accounts and amending Council Directives 78/660/EEC and 83/349/EEC and repealing Council Directive 84/253/EEC.

statutory audits) have, beyond their traditional duties¹, a new task to certify annual and consolidated sustainability reportings. They must give an opinion on whether sustainability information complies with European Union requirements².

Specifically, this is an opinion concerning:

- compliance of sustainability information with the requirements of this Directive;
- compliance of the sustainability reporting with EU sustainability reporting standards;
- the process carried out by the undertaking to identify information reported in accordance with sustainability disclosure standards;
- compliance with the obligation to mark sustainability information in accordance with the electronic information format;
- compliance with the information requirements set out in Article 8 of the Taxonomy Regulation³.

4.2.2. How the auditors express their opinion

As stated in the Directive (Whereas 60), “the assurance profession distinguishes between limited assurance engagements and reasonable assurance engagements”. In relation to the sustainability report, the auditor is required to express his opinion in a limited assurance engagement. In such engagements, the conclusion is usually expressed in a negative form, whereby the practitioner informs that he or she has not identified any issues leading him or her to conclude that the object has been materially misstated. In such an engagement, “the auditor performs fewer tests than in a reasonable assurance engagement. The amount of work for a limited assurance engagement is therefore less than for a

reasonable assurance engagement. (...)”⁴. This opinion may be issued by a statutory auditor (‘commissaires aux comptes’ in France, ‘auditori financiari’ in Romania) or by an audit firm other than the auditor(s) carrying out the statutory audit of the entities’ financial statements.

The legislator provides for a gradual increase of the level of assurance by moving from limited to reasonable insurance. This prudence is due, at least in part, to the absence at this time of a set of sustainability assurance standards, be they of the International Federation of Accountants (IFAC), the International Sustainability Standards Board (ISSB) or EFRAG. In practice, the transition to a reasonable assurance engagement on compliance of sustainability reporting with EU requirements will be possible when the Commission adopts the assurance standards for reasonable assurance of sustainability reporting by means of delegated acts by October 1, 2028 at the latest⁵.

4.2.3. Increasing professional skills requirements

Whether certifying financial statements or sustainability information, the auditors belong to a regulated profession because they serve the public interest. Therefore, the professional must be licensed by an independent authority. It can then audit the annual accounts and/or sustainability report.

The licensing process requires regulated training, the auditor being able to practice: “only after having attained university entrance (...), then completed a course of theoretical instruction, undergone practical training and passed an examination of professional competence of university final or equivalent examination level.” The professional competence exam or the final exam is a complex one, which guarantees theoretical knowledge in areas relevant from a sustainability perspective, such as: standards for the preparation of annual and consolidated sustainability reporting; sustainability analysis; sustainability due diligence; legal requirements and assurance standards for sustainability reporting. Practical training of at least three years needs to be completed, of which at least 2/3 with a statutory auditor. A special possibility is offered to

¹ In accordance with Article 34 of the Accounting Directive, the statutory auditor or the audit firm shall express an opinion on: (i) the consistency of the management report with the financial statements; (ii) preparing the management report in accordance with applicable legal requirements.

² Directive (EU) 2022/2464, Article 3 and Whereas 60.

³ “Any undertaking which is subject to an obligation to publish non-financial information pursuant to Article 19a or Article 29a of Directive 2013/34/EU shall include in its non-financial statement or consolidated non-financial statement information on how and to what extent the undertaking’s activities are associated with economic activities that qualify as environmentally sustainable under Articles 3 and 9 of this Regulation.”

⁴ Directive (EU) 2022/2464, Whereas 60

⁵ *Ibid.*

professionals who have worked for at least 15 years or those who are approved in another EU Member State¹.

EU Member States are required to establish a quality assurance system for statutory auditors through public supervision, such as ASPAAS in Romania (Autoritatea pentru Supravegherea Publică a Activității de Audit Statutar/Authority for Public Oversight of Statutory Audit) or H3C in France (Haut conseil du commissariat aux comptes).

4.2.4. Increasing complexity of audit missions

The auditor shall express his opinion on the information produced and presented in accordance with European standards. This information, the content of which has been further developed in point 3.2.2. are of great complexity. The sustainability report is not a promotional, greenwashing, communication document of a company, but a technical document drafted according to well-defined, binding technical rules.

4.2.5. Ethics requirements

As with statutory audit, the auditor is bound by “professional ethics, independence, objectivity, confidentiality and professional secrecy”. As regards independence, the Directive states that “fees for statutory audits and the assurance of sustainability reporting:

- are not influenced or determined by the provision of additional services to the entity (...);
- cannot be based on any form of contingency².”

In case of infringements, effective, proportionate and dissuasive penalties are required.

The Accounting Directive entrusts management bodies (board of directors, supervisory board, management board) with ensuring, as part of their collective responsibility commitment, that financial statements have been prepared in accordance with legal requirements. Directive (EU) 2022/2464 extends this responsibility to sustainability reporting. In addition, if it is a public-interest entity, it must have an audit committee. Therefore, the principle of separating preparation from control of information must be respected in both cases.³

The difficulty of developing and auditing complex, multidimensional and multidisciplinary information like those described above is obvious. Many professions are outside their comfort zone. It will probably take many years to stabilize the device whose stake is fundamental to society.

Conclusions

Issues related to the sustainability of financial, human and natural capital have now become societal problems, too complex to be the subject of research based on checking the causal links between several measurable variables. International governmental organizations (UN and OECD) or non-governmental organizations (ISSB, IFAC, GRI, etc.), aware of the threats affecting the world, try to propose tools capable of leading a change in society, even civilization. For our part, we have essentially confined ourselves to studying the recent European regulations accompanying the transition from a market economy to a 'sustainable' civilization. Their political approach has been studied from the point of view of business law and, in particular, the publication of information by and about companies. Our goal was to clarify and make sense of conceptual innovations.

The basic premise is that of the performativity of information published by companies. In other words, the sustainability objective of the three types of capital can be achieved by informing stakeholders about the impact of sustainability matters on the company and the impact of the company's activities on the environment and society as a whole (the concept of 'double materiality').

European regulations have evolved in the last ten years also by introducing conceptual changes, loaded with meaning and promoting new values, which have given rise to legal innovations. Thus, the term '*non-financial information*' used in the Accounting Directive (2013/34/EU) was gradually deleted in order to eventually retain the term 'sustainability information' in Directive (EU) 2022/2464. Integrated into sustainability reporting, which becomes a component of the management's annual report, sustainability information has a complex content, able to bridge the gap between the information required by stakeholders and those provided by companies. The increasing complexity of the information to be reported was accompanied by the expansion of the perimeter of the actors covered by this obligation. Sustainability information is connected to the financial statements and

¹ Directive (EU) 2022/2464, Article 3(4)

² *Idem*, Article 13.

³ Directive (EU) 2013/34, Article 33.

must be audited by certified professionals to be credible. Another major innovation is related to the emphasis placed on value creation, respectively to the introduction of the concept of 'value chain', which leads to an extension of the liability of the legal person (or even of the consolidated group) beyond the acts for which it is directly responsible. Thus, it becomes liable for certain actions of its suppliers, subcontractors, customers, etc.

These fundamental changes are still in their infancy. We need to wait for implementing texts and case-law for their integration into economic practice to become effective. However, they will have a considerable impact on the accounting profession, professional judgements and interpretation and control models of financial analysts and

auditors. Analysis and certification of management reports will require multidisciplinary expertise. Thus, for example, engineers, physicists, chemists or biologists will be called to the table to decide on the indicators belonging to their disciplines, to feed the argument, primarily financial until now.

Finally, university curricula and continuing education of professionals will need to be rethought to enable a holistic approach to performance, which will evolve from *financial performance* towards a *societal performance of the company's value chain*. This is an extremely vast 'construction site' that concerns all countries and all professions. The environment has no borders.

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Annex 1: Non-financial and sustainability reporting perimeter. Comparative approach	
Directive (EU) 2014/95	Directive (EU) 2022/2464
Non-financial statement	Sustainability reporting
Large undertakings which are European public-interest entities within the meaning of Article 1(a)(1)¹ of the Accounting Directive, governed by the law of a Member State and whose securities are admitted to trading on a regulated market in the Union, having: - more than 500 employees during the financial year; - turnover > EUR 40 million, and/or - balance sheet total > EUR 20 million.	Large UE and non-UE companies listed on a European regulated market that meet at least two of the following criteria: - more than 250 employees during the financial year; - turnover > EUR 40 million, and/or - balance sheet total > EUR 20 million.
	Other major UE companies All other large European companies meeting at least two of the following criteria: - more than 250 employees during the financial year; - turnover > EUR 40 million, and/or - balance sheet total > EUR 20 million
	Other large companies outside UE Non-European companies with a turnover in the Union exceeding EUR 150 million and at least one subsidiary or branch in the Union²
	SMEs listed on a European regulated market All EU and non-EU SMEs included in an EU regulated market, except microenterprises

Source: Processing after Directive (EU) 2014/95 and Directive (EU) 2022/2464

Annex 2: Content of information to be reported. Comparative approach	
Directive (EU) 2014/95	Directive (EU) 2022/2464
Non-financial information	Sustainability information
I. Information about the company's development, performance, position and impact A brief description of the company's business model	I. Information on sustainability matters and information areas A brief description of the company's business model and strategy - the resilience of the company's business model and strategy - opportunities related to sustainability issues; - company plans, including implementation actions and related financial and investment plans (...); - how the company's business model and strategy take into account the interests of stakeholders and the company's impact on sustainability issues; - how the company implemented its strategy with regards to sustainability issues. Information on essential intangible resources and how the company's business model fundamentally depends on these resources. Sustainability targets and their deadlines (...). A description of progress towards the objectives. A statement that the environmental objectives are based on conclusive scientific evidence. A description of the role of administrative, management and supervisory bodies with regard to sustainability issues and a description of their expertise and competences.
Directive (EU) 2014/95	Directive (EU) 2022/2464

¹ "societate pe acțiuni, societate cu răspundere limitată, societate în comandită pe acțiuni" in Romania, respectively: "la société anonyme, la société en commandite par actions, la société à responsabilité limitée, la société par actions simplifiée" in France.

² Directive (EU) 2022/2464, Whereas 20.

Non-financial information	Sustainability information
A description of the company's policies on these matters and the due diligence procedures implemented. Results of these policies	A description of the company's policies on sustainability issues. Information on the existence of incentive schemes related to sustainability matters offered to members of administrative, management and supervisory bodies. A description of: - the due diligence process implemented (...); - the main negative impact, actual or potential, related to the company's own activities and value chain (...); - any measures taken by the undertaking to prevent, mitigate, correct or eliminate actual or potential adverse effects and the result achieved in this regard.
Main risks related to these matters	A description of the main risks for the company related to: - the company's own shares; - its value chain. Risk indicators.
II. Environmental information The current and foreseeable impact of the company's operations on the: - environment; - health and safety; - use of renewable and/or non-renewable energy; - greenhouse gas emissions; - water use; - air pollution.	II. Information on the following environmental factors: (i) mitigation of climate change, including greenhouse gas emissions (...); (ii) climate change adaptation; (iii) aquatic and marine resources; (iv) resource use and circular economy; (v) pollution; (vi) biodiversity and ecosystems.
III. Social and employee matters concerning: - measures taken to ensure gender equality; - implementation of fundamental conventions of the International Labour Organisation (ILO); - working conditions; - social dialogue; - respect for the right of workers to be informed and consulted; - respect for trade union rights; - health and safety at work; - dialogue with local communities and measures taken to ensure the protection and development of these communities; - prevention of corruption; - prevention of human rights violations.	III. Information on social and human rights factors: (i) equal treatment and equal opportunities for all, including gender equality and equal pay for work of equal value, development of training and skills, employment and inclusion of persons with disabilities, measures to combat violence and harassment at work and diversity; (ii) working conditions, including job security, working time, decent wages, social dialogue, freedom of association, existence of works councils, collective bargaining, including the proportion of workers covered by collective agreements, workers' rights to information, consultation and participation, work-life balance; health and safety; (iii) respect for human rights, fundamental freedoms, democratic principles and standards as set out in International Human Rights Law and other fundamental conventions of the United Nations (...).
It refers to the Corporate Governance Statement, according to Article 20 of the Accounting Directive.	IV. Information on governance factors: (i) the role of the undertaking's administrative, management and supervisory bodies with regard to sustainability issues, their composition and their expertise and powers (...); ii) the main characteristics of the company's internal control and risk management systems, in relation to (...) sustainability; (iii) corporate ethics and culture, including the fight against corruption, whistleblower protection and animal welfare; (iv) the undertaking's activities and commitments relating to the exercise of its political influence, including its interest representation activities; (v) the management and quality of relations with customers, suppliers and groups affected by the company's activities, including payment practices, in particular with regard to late payments to small and medium-sized enterprises.

Source: Processing after Directive (EU) 2014/95 and Directive (EU) 2022/2464



Empirical Study on the Analysis of the Financial Auditor's Concern in Ensuring the Transparency and Sustainable Performance of BSE Listed Companies

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Abstract

Sustainable development of the company implies achieving a balance in terms of economic, social and environmental activities with the aim of making optimal use of the entity's resources without harming the environment and through an active involvement of the company in society. To this end, an important role is played by the financial auditor, the guarantor of transparency in financial reporting and an active player in enforcing discipline in sustainable reporting. Through the audit report, including the opinion expressed, the auditor contributes to the credibility of the audited financial statements and inspires confidence in all users. The purpose of this study is to test the influence of the audit opinion and the auditor's membership of the Big4 group of companies on key indicators of financial position and performance, as well as on the use of performance management operations. The study also tested the influence of the audit opinion, in conjunction with the influence of key financial indicators, on the probability of reporting Key Audit Matters (KAM) related to earnings management operations or going concern. The study was conducted at the level of Romanian companies listed on the Bucharest Stock Exchange (BSE) – Regulated Market, in the period 2012-2022. Using advanced statistical methods of data analysis, the main results of the study indicate the existence of a significant influence of the previous year's audit opinion expressed by a particular type of auditor on key indicators of financial position and performance, as well as on discretionary accruals. At the same time, the prior year audit opinion as well as the current year values of the key financial indicators analysed have a significant influence on the probability of reporting on Key Audit Matters (KAM) related to earnings management operations or going concern.

Key words: financial auditor; financial transparency; sustainable performance; audit opinion; key audit matters; Bucharest Stock Exchange;

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1. Introduction

The harmonious combination of social, economic and environmental factors contributes to the sustainable development of companies. Ensuring transparency in the communication of information required by stakeholders makes a significant contribution to the sustainable performance of organisations. In order to ensure transparency, the information presented in both annual financial statements and audit reports must meet a number of characteristics, including: accuracy, completeness and neutrality. In recent years, in order to increase transparency in financial auditing, the audit report has been improved by adding a separate Key Audit Matters (KAM) section. What are Key Audit Matters? These are those matters which, based on the auditor's professional judgement, are of most importance to the audit of the financial statements for a period and are selected from those matters discussed with those charged with governance (IAASB, 2021).

The auditor is interested in identifying as accurately as possible the problems that the audited companies might have in their business. In the relevant literature, this behaviour is put down to the reputational and litigation risks that auditors would assume if they fail to detect errors that may lead to the reported result (Lennox & Kausar, 2017). Results proposed by Kaplan & Williams (2013) show that auditors use the possibility of expressing a Going Concern Opinion (GCO) as a preventive action in limiting the risks of being involved in litigation with users of financial statements affected by the audited firms' following difficulties. The quality of the audit, as assessed by the competence and independence of the auditor, also affects the probability that a firm with financial problems will receive a GCO (Ruiz-Barbadillo et al., 2004).

Although financial markets are increasingly connected, differences between countries can lead to different manifestations of firms, managers or auditors, depending on the geographical context under analysis. Bao & Lewellyn (2017) advance the idea that audit, through its ability to constrain firms' earnings management practices, is dependent on both the characteristics of the firm and the specifics of the country in which it operates. Specifically, these factors act differently depending on the category into which countries fall: developed or emerging. The vast majority of the studies relate to the situation of listed (and sometimes unlisted) North American firms or

firms in other developed countries. However, there is relevant literature applying original methodologies or replicating established methodologies, which aim to show the particularities of emerging countries in different parts of the world, individually or in groups. Cultural elements are also determinant in the auditor's reaction to the information proposed by the audited companies. Chen et al. (2016) find that in countries characterised by a culture of secrecy, auditors are more likely to express modified opinions (including in multinational companies), a tendency limited by the degree of investor protection.

The developments that we can see and try between audit and sustainability are steps towards bringing a topic that was, some time ago, outside the usual research area in audit and accounting into the audit sphere. Andon et al. (2015) argue that the interest in efficiency and sustainability demonstrates that what is outside of auditing at one point in time can become the central theme of the discipline.

This study primarily aims to test the influence of audit opinion type and auditor membership (*Big4/Non-Big4*) on financial position and performance on the one hand and on earnings management practices on the other. Then, by correlating the type of audit opinion with the influence of financial indicators, the influence of these indicators on the probability that the auditor includes key matters relating to earnings management practices or affecting going concern in the audit report is tested. The results show that these influences are generally significant: key indicators of financial position and performance and discretionary accruals depend on both the type of audit opinion and the type of auditor; the probability of reporting key audit matters relating to earnings management operations or going concern depends on the type of audit opinion but also on the values of the key financial indicators analysed.

The study is further structured in sections. Section 2 is devoted to reviewing the literature focused, on the one hand, on the factors influencing reporting transparency and sustainable performance of companies from a financial auditing perspective and, on the other hand, on developing the research hypotheses by summarizing the variables of interest, their source, the methodology used and the results obtained. Section 3 focuses on the research methodology, broken down into: the study population and the sample analysed, the variables analysed, the source of the data and the models proposed for testing. Section 4 deals with the results obtained from

the processing carried out and their interpretation. The final part of the study is for conclusions.

2. Reviewing the literature and formulating research hypotheses

The quality of companies' financial and non-financial reporting is also assessed by stakeholders in terms of the transparency of reporting by those responsible for preparing financial statements and by the guarantors of their credibility, i.e. financial auditors. Increasing the communicative value of the audit report to support stakeholders by ensuring greater transparency in audit reporting is also supported by the introduction of KAM in the content of the report (Köhler et al., 2020).

2.1. Improving transparency in reporting through financial auditing

It is well known that financial statements are used by users as one of the sources of information needed to make financial decisions. The quality of financial reporting is a constant concern for both the producers of these reports and the auditors who review them and, most importantly, for users, including regulators. A commonly used indicator to measure the quality of reporting is earnings management, either based on accruals earnings management (AEM) or real earnings management (REM) (Beneish, 2001; Roychowdhury, 2006). This type of manipulation of information reported in financial statements can be mitigated by the intervention of financial auditors, who thus contribute to better and more transparent information for users and, by doing so, to creating and maintaining the necessary framework for companies to develop sustainably. Of course, we expect a quality audit to limit the levels of earnings management (Alzoubi, 2016) and significantly reduce the level of errors and reporting inaccuracies (Cardinaels & Jia, 2016), but also to discourage earnings management by increasing firm focus and honest and systematic communication with the board (Buchanan et al., 2021). The usefulness of financial statements to investors thus depends on the quality of this reporting, but also on the quality of the related financial audit (Chen, et al., 2019).

Increasing audit quality is a natural concern for the regulator, professional organisations and individual

auditors. The mandatory inclusion in audit reports of key audit matters identified during the engagement was an important step in improving audit quality in the form of better communication and greater transparency, leading to lower agency costs (Barghathi et al., 2021). Of course, auditor efforts in detecting and reporting potential nonconformities must be matched by efforts on the part of users to understand the messages being conveyed by auditors. It is possible that the inclination of some users (especially institutional users) to privilege exogenous irrelevant information may lead to a decrease in audit quality, a decrease in the probability of an GCO, and a decrease in the probability of the auditor reporting internal control weaknesses (Chan et al., 2021). Not including adverse information in annual reports is in the interest of management to convey positive messages and may affect the comprehensibility of the annual report. In such a situation, Blanco et al. (2021) find that audit risks increase, leading to longer periods for conducting audit engagements and thus higher fees. Analysing the readability of key audit matters (KAM) included in the audit report, Hussin et al. (2023) note a significant impact of female auditors on the development and transparency of this section for a sample of Malaysian firms.

The unqualified audit opinion provides users with assurance that the financial statements comply with applicable standards. If the opinion is modified, the auditor warns users that the level of transparency of the financial statements does not meet the standards. A link between firm transparency and audit effort is made by Asante-Appiah (2020) who finds that auditors need to make extra efforts – materialised in several days dedicated to the engagement – if the firm does not have a good reputation on how it addresses sustainable development objectives (Environmental-Social-Governance – ESG).

Transparency in bringing audit opinions to the attention of users is not limited to making the audit report public. Khan et al. (2017) analyze the effects of publishing GCOs as press announcements and as announcements on stock exchange websites as a result of obligations imposed by the financial market regulator and find that this information significantly influences investor reaction. Transparency of financial information – including what is proposed by the audit report – should not be selective: all users, internal or external, should benefit from specific information at the same time. Arif et al. (2022) warn that insiders who become aware of the audit report (when it contains a modified opinion) prior to its publication may take

advantage of it by engaging in abnormally frequent trading in the firm's securities.

Users of financial statements should also consider the tone in which the annual report is written, especially the financial part. Hossain et al. (2020) find that an abnormally positive tone in reporting is associated with a higher probability of receiving a GCO. Communication skills of both the firm and the auditor significantly influence the transparency of financial statements by increasing the credibility of reports and confidence in the value of auditing (Akther & Xu, 2021) as a governance tool. Financial analysts, with a key role in collecting, interpreting and disseminating information also depend on the quality of the audit and financial reporting environment (Cheong & Zurbrugg, 2016).

Improvements in the quality of financial reporting are also expected from the introduction of mandatory auditor changeover rules. Lin & Yen (2022) prove that this auditor rotation can influence the quality of financial reporting only under certain circumstances, i.e. when the new auditor comes with a different risk assessment, which may influence their audit plan and audit process.

2.2. The auditor's confirmation of the entity's going concern as a premise for sustainable performance

The auditor's detection of events and evidence that may affect the entity's ability to perform as a going concern is an important event in financial reporting. The auditor's application of specific standards may not be sufficient in identifying risks to going concern. Baza & di Trana (2019) assess that ISA 570 (Italian version), while suggesting a list of items that could be signals of uncertainty about the firm's ability to perform a going concern, does not establish a hierarchy of their importance. In the literature review they present in their study, Baza & di Trana (2019) find many studies that focus on financial analysis indicators, but also studies that propose and introduce as variables non-financial indicators (related to the market, strategic initiatives or governance characteristics), indicators on the role of management plans, customer characteristics, but also auditor characteristics. Carson et al. (2016) identify the use of the following indicators:

- Liquidity indicators: current assets/current liabilities, interest expense/EBIT, cash flow/current liabilities, WC/total liabilities, operating cash flow/total liabilities;
- Profitability indicators: net result/total assets (ROA), reserves and retained earnings/total assets; EBIT/total

assets, gross income/sales; current or recurrent losses;

- Leverage indicators: market to book ratio, equity/debt; total debt/total assets.

Reporting a Going Concern Opinion (GCO) is especially likely for firms in serious financial distress and has come to be seen as a proxy for audit quality (Aguilar et al., 2018, although Chu et al., 2022, and Guo et al., 2020, demonstrate that this option is risky) or evidence of auditor independence (Ruiz-Barbadillo et al., 2004; DeFond & Zhang, 2014). Financial difficulties can also arise when the firm is highly dependent on a client; indeed, this type of dependence sometimes appears in the justification of qualified opinions or observations in the audit report (Istrate et al., 2020, Dhaliwal et al., 2020). The prudence of the auditor (including reputational risks) may lead him, in the case of firms in difficulty, to express a GCO, at the risk of being overruled by following developments in the firm's situation (Type I error), rather than not expressing a GCO, at the risk of the firm becoming insolvent later (Abbot et al., 2022). However, these reputational risks – often identified in the literature – do not seem to affect the situation of the auditor involved very much: Berglund (2020) finds that auditors involved in such cases (Type II errors) are not very strongly affected, even though for audited firms, bankruptcy is less predictable than in the case of a GCO. The issuance of a GCO is a signal not only for the firm involved or for the auditor; Casterella et al. (2020) analyse the extent to which not issuing a GCO for bankrupt firms influences stock market prices for firms similar to the bankrupt firm; the effect is a significant decrease in these prices compared to the situation where bankruptcy was preceded by a GCO.

Analyzing more than 30,000 observations from 20 emerging countries, Viana Jr. & Lourenço (2022) predictably identify attempts at increasing earnings manipulation by financially distressed firms (using accruals), tempered by the presence of *Big4* auditors.

The emergence and manifestation of various crises (financial, health, political, energy, military) are events that can make auditors more careful in identifying audit evidence and expressing opinions. The increased conservatism of auditors in times of crisis may lead them to be more careful than usual, especially when they are in the position of expressing a GCO based on the predictors of such an opinion (Beams & Yan, 2015). However, there are statistics showing that a significant proportion of firms that enter bankruptcy have not received GCO prior to this

event (Feldman & Read, 2010). Some crises – such as the global financial crisis that began in 2008 – have also had the effect of changing regulations as well as auditor procedures and behaviours, such that auditors have become more inclined to express GCOs post-crisis for both *Big4* and *Non-Big4* firms in financial difficulties (Geiger et al., 2014). However, after a period of increase in this type of opinion, pre-crisis weights returned to pre-crisis levels in 2006 (Read & Yezegel, 2018).

As for the management characteristics of firms that might receive GCO, there are several variables that can influence the auditor's decision. Berglund et al. (2018) find that managerial ability is negatively associated with the GCO, regardless of how the firm later performs; at the same time, this managerial ability is associated, by Gul et al. (2018), with lower accrual quality in firms with financial problems, but also with higher audit fees. Managerial behavior can lead to pressure on auditors not to express GCO when managers – as insiders – sell out of shares held in the firm (Chen et al., 2013). As a general rule, managers are optimistic about going concern, even if the company is experiencing visible difficulties; this optimism is also reflected in their forecasts of the evolution of financial indicators. However, auditors have to be circumspect and, in the case of firms with difficulties, they do not take much account of managers' estimates (Feng & Li, 2014), and even become more inclined to express a GCO, especially when managers are very confident and less skillful (Kim M., 2021). Often, however, the optimism of managers is also transferred to auditors in the sense that they do not report going concern problems: Mareque et al. (2017) identify more than half of the Spanish firms analysed that went bankrupt in 2010 as not having received GCO in previous years.

Performing non-audit services by auditors may affect their inclination to express GCO (Geiger et al. 2022). However, the profession asserts (and some studies confirm) that non-audit services provided to a firm can lead to a better auditor's knowledge of that firm and thus a more well-founded audit opinion (DeSimone et al., 2015).

2.3. Gender differences and transparency in auditing

The composition of the audit team can have significant effects on the quality of the audit. Cameran et al. (2018) find that such influence

undergoes changes throughout the audit engagement. One of the characteristics of audit teams is the presence of women as partners or managers; Cameran et al. (2018) find that, in Italy, a higher proportion of women in such positions leads to an increase in audit quality as measured by accruals; the same direction of decreasing abnormal accruals is found by Ittonen et al. (2013) for Finland and Swedish firms. Hardies et al. (2016) identify, on the example of Belgian firms, a greater propensity of female auditors to provide CGOs to firms in financial distress and that women produce better audit quality, mainly because they are more independent and risk averse. Also, in other Finland firms, female auditors are characterized by greater discretion in reporting results, being more conservative than male auditors (Niskanen et al, 2011); under these circumstances, gender diversity in audit teams is considered to improve the overall quality of financial reporting. Kung et al. (2019) show us that if the head of the audit team is female, then the dimensions of results management through accruals are more limited in the case of Taiwanese firms (where joint audits are practiced), but that this is also true for male audit teams with expertise in the industry in which the audited firm operates. Ittonen & Peni (2012), based on the observation that audit fees are higher when the audit partner is female, propose an explanation – which they shy away from generalising – that gender differences in the planning, preparation, diligence of such a partner can explain the differences in fees. I have mentioned the geographical context in the above-mentioned studies, because differences may arise from the specific features of a country or region. In China, for example, Yang et al. (2018) find that differences in audit quality between female and male auditors are insignificant when firms try to manipulate earnings to increase earnings; on the contrary, differences occur when firms use accruals to decrease earnings, and these differences suggest better audit quality by men. The same study finds that the gender gap is significantly reduced when the age considered exceeds 45. Gender research has also been carried out on the number of KAMs reported by female versus male auditors: Bepari et al. (2022) conclude that female auditors perceive more risks

in their audit work and therefore report more KAMs in order to minimize these risks and reduce their exposure to getting involved in user disputes.

Of course, research on women's participation in audit engagements does not all converge on better quality provided by women. There are also studies that find, in certain geographical contexts and on certain financial coordinates, that the quality of audit performed by women does not always match the quality of audit performed by men: Yang et al. (2018) provide us with a list of studies with such findings.

The presence of women in the audit engagement is not limited to their membership of audit teams. It is also interesting to see what influence the presence of women as members of the boards of directors or audit committees of audited companies may have on audit variables. The imposition by some countries (Norway, France, etc.) of minimum quotas for women on various company committees has been an important source of gender research. Nekhili et al. (2019) find that the appointment of women to boards, as independent directors and also as members of audit committees, leads to a decrease in perceived auditor risk and, consequently, a decrease in audit fees.

2.4. Developing research hypotheses

The introduction of the requirement for the auditor to provide an extensive report, including KAM, was intended to increase the information content and usefulness of the audit opinion in order to increase the ability of users to monitor management, but also auditors, through better communication between users of financial reporting and auditors (Minutti-Meza, 2021; Moroney et al., 2021). However, this informational boost is not free: reporting some KAMs leads to increased financial reporting costs (Bentley et al., 2021); Chen et al. (2019) show that auditors' efforts in increasing audit report quality are only covered in the case of low-quality financial reporting.

The number of KAMs reported by auditors depends on a multitude of factors (Bepari et al., 2022) related to accounting rules (rules applied

and various accounting options), auditor characteristics (size, audit fees, non-audit services provided to the firm, auditor experience and specialisation, auditor gender, auditor training), and entity characteristics (size, life cycle phase, business complexity, litigation risks, profitability, information asymmetry).

Users' perception of the firm may be influenced by the presence of KAM in the audit report. Moroney et al. (2021) find that investors perceive the audit as more valuable and credible when the report includes KAM, but that this conclusion is particularly true for *Non-Big4* auditors; for *Big4*, audit reports with or without KAM are perceived as equally useful. It appears that *Big4* auditors are perceived as providing a quality audit regardless of whether or not KAM is presented. However, it is a bit of a stretch to consider *Big4* as a homogeneous group. Honkamäki et al. (2022) find differences between the *Big4*'s audit procedures and strategies, differences embodied in different ways of reporting KAM, although the quality of the audit provided by the *Big4* remains high.

Overall, audit quality has increased significantly after the introduction of KAM mandatory reporting rules (Zeng et al., 2021). In contrast, in another geographical context, Gutierrez et al. (2018) find evidence that the new audit report format (which includes KAM) comes with very little additional information for investors and has insignificant effects on audit quality and audit fees.

The literature proposes quite obvious meanings of the influence of some variables on GCO. Averio (2021) – proposing hypotheses in line with the relevant literature – confirms the positive correlation between leverage and GCO, but also negative correlations between audit quality, profitability and liquidity, on the one hand, and GCO, on the other; at the same time, for the Indonesian firms analysed, Averio (2021) finds no correlations between GCO and firm size or *audit report lag*.

Table no. 1 includes the variables identified in the literature of interest for this study, their source, the models applied and the results obtained, which will support the hypotheses formulated and the processing made in the part dedicated to the research methodology.

Table no. 1. Variables of interest, their source, models applied and results obtained

Variable	Source	Methodology	Results
Audit opinion type: unqualified/qualified (AO)	(Blanco et al., 2021)	Linear regression models	Manipulation of information by management → Unqualified audit opinion → Increased audit risk
	(Arif et al., 2022)	Regression models on panel data	Qualified audit opinion → Market reaction
	(Dhaliwal et al., 2020)	Logistic regression models	Dependence on a customer → Qualified audit opinion
	(Grosu, V. et. al, 2020)	QATMT Model (Quick audit test for readjustment of materiality threshold)	Doubtful quality of reporting → Qualified audit opinion
	(Grosu, M. et al., 2021)	Regression Models and Multivariate Data Analysis Methods	EM (+) → Qualified audit opinion
Auditor type: Big4/Non-Big4 (AT)	(Viana Jr. & Lourenço, 2022)	Multivariate Data Analysis Methods	Big4 Auditors → EM(-)
	(Geiger et al., 2014)	Logistic regression models	Big4 Auditors and Non-Big4 → GCO for firms in financial difficulty
	(Moroney et al., 2021)	Regression models on panel data	KAM Reporting by Non-Big4 → Quality Audit
ROA, ROE, FL	(Hardies et al., 2016)	Linear regression models	Women auditors → GCO for firms in financial difficulty
	(Geiger et al., 2014)	Logistic regression models	Big4 Auditors and Non-Big4 → GCO for firms in financial difficulty
	(Kothari et al., 2005)	Jones Model and Modified Jones Model	ROA → EM(+/-)
	(Averio, 2021)	Logistic regression models	High debt → GCO High profitability → Non-GCO
	(Grosu, M., 2023)	Multivariate data analysis methods and regression models	Negative equity and going concern opinion → Qualified audit opinion
Earnings Management (EM)	(Campa, 2019)	Altman Z-score, Jones Model (1991), Kothari Model (2005)	Presence of financial problems → EM(+)
	(Durana, et. al., 2021)	A hierarchical mixed model with a random effect of time and industry	Entities in recession → EM(+)
	(Alzoubi, 2016)	Modified Jones model (cross-sectional)	Quality audit through transparency → EM(-)
	(Buchanan et al., 2021)	Perceptual discouragement theory and regression models	Quality audit through transparency → EM(-)
	(Ittonen et al, 2013; Cameran et al., 2018; Kung et al., 2019)	Linear regression models, Models for measuring discretionary accruals	Women auditors → EM(-)
	(Alhadab, 2018)	Regression models	Additional auditors' fees → EM(-)
Going Concern Opinion (GCO)	(Chan et al., 2021)	Regression models on panel data	Manipulation of information by management → Decrease likelihood of issuing GCOs
	(Blay et al., 2011; Khan et al., 2017; Rodgers et al., 2019)	Regression Models, Score Functions, Throughput Model	Publication of GCO → Market reaction
	(Aguilar et al., 2018)	Multivariate analysis methods	Financial constraints → GCO
	(Casterella et al., 2020; Hossain et al., 2020)	Regression models	Non-GCOs for bankrupt entities → Significant decrease in share price
	(Chen et al., 2013)	Regression models	Management constraints → Non-GCO
	(Robu et al., 2012)	Regression and Correlation Models and Principal Component Analysis	Non-compliance with the presumption of going concern in the preparation of annual financial statements → GCO
Key Audit Matters (KAM)	(Barghathi et al., 2021)	Semi-structured survey	KAM reporting → Transparency and decrease agency costs
	(Hussin et al., 2023)	Regression models on panel data, Flesch reading ease score and Coleman-Liau index	Auditor gender → Audit transparency through KAM
	(Bepari et al., 2022)	Regression models	Women auditors, increased risks, decreased profitability → more KAMs

Source: own processing based on the literature studied

Note: EM(+) is the manifestation of earnings management practices; EM(-) is the decline in earnings management practices; KAM is Key Audit Matters; GCO is Going Concern Opinion; ROA is Return On Assets; ROE is Return On Equity; FL is Financial Leverage.

Based on the literature reviewed and, in particular, the patterns noted in the papers mentioned in **Table no. 1**, the following research hypotheses are formulated:

- H1:** *In the case of Romanian BSE listed companies, the audit opinion of the previous financial year has a significant influence on the financial performance, leverage ratio and the level of operations management of the current financial year's earnings.;*
- H2:** *In the case of Romanian BSE listed companies, the audit opinion in the previous financial year, as well as the financial performance, the level of leverage and the level of earnings management operations in the current financial year have a significant influence on the probability of formulating a key audit matter on earnings management operations or on-going concern (including observations on compliance with the use of this principle in financial reporting) in the current financial year.*

The testing of the formulated research hypotheses is made in the research methodology part, after the choice of the sample and the relevant models, and comments on their validation are included in the results and discussion part.

3. Research methodology

Based on the research hypotheses proposed for testing and validation, as mentioned in the introductory part, the objectives of the study are, on the one hand, to test the influence of the prior year audit opinion on financial performance, leverage and the level of current year earnings management operations by auditor type (*Big4* and *Non-Big4*) and, on the other hand, to test the influence of the prior year audit opinion, as well as financial performance, leverage, and level of current year earnings management operations, on the probability of making a key audit matter on earnings management operations or going concern (including observations on compliance with the use of this principle in financial reporting) in the current year, by auditor type (*Big4* and *Non-Big4*).

The following is a description of the variables (generally qualitative) identified in the literature for which data were collected and processed in the models analysed below. The key audit matters (KAMs) on the operations of the management of the result concerned the auditor's

observations in the audit report on: aggressive recognition of provisions or reserves, overstatement of research and development expenses, but also of those related to restructuring, understatement of provisions associated with doubtful or highly doubtful debts, recognition of unrealised income, recording of fictitious sales, inadequate recording of stocktaking results (Toumeh & Yahya, 2019).

Key audit matters (KAM) on going concern (including observations on compliance with the use of this principle in financial reporting) are intended to cover cases where: there is a separate paragraph in accordance with ISA 700 (revised), or a number of key audit matters are highlighted in the audit report flagging a number of items that may affect going concern in accordance with ISA 701 (CAFR, 2022). Indicators that may signal potential going concern opinion may include: high leverage, withdrawal of creditor support, negative cash flows from operations, low liquidity, unfavourable returns and profitability, creditor default, as per ISA 570 (revised) (CAFR, 2022).

The study follows a statistical approach to test and validate the proposed research hypotheses (Jaba, 2002). Thus, a representative sample of the identified study population is selected for data collection and analysis using advanced statistical data analysis methods (Robu, I.B., 2012; Robu, 2021).

3.1. Study population and sample analysed

In order to test and validate the proposed research hypotheses, the study population is represented by all companies listed on the Bucharest Stock Exchange (BSE-www.bvb.ro) – *Regulated Market*. Also, these firms fall under the scope of Law no. 162/2017, being subject to statutory audit. As of 2023, there were 84 listed companies on the BSE – *Regulated Market*, of which 29 in the *Premium* category, 52 in the *Standard* category and 3 in the *Int'l* category.

From the 84 companies listed on the BSE, those representing financial intermediaries, banks, insurance and reinsurance institutions, as well as companies for which not all the information required for the analysis at the 2012-2022 level was found were eliminated. This resulted in a balanced sample of 37 listed companies, analysed over 11 financial years, providing a total of 407 observations. The sample is quite limited, which affects the generalizability of the results, but there are other

studies in the literature analyzing emerging financial markets, where the number of listed firms does not create very large populations; Averio (2021), uses a sample of 33 firms listed on the Indonesia Stock Exchange over a 5-year period. Similarly, Alves (2013), analyses 33 Portuguese firms, over 7 years, in terms of the correlation between audit committee, external auditor and earnings management.

3.2. Models analysed and source of data

To achieve the research objectives, the study proposes the use of linear regression analysis and logistic regression analysis respectively (Robu, 2021).

The general econometric model proposed for testing the influence of prior year audit opinion on financial performance, leverage, and the level of current year earnings management operations by auditor type (*Big4* and *Non-Big4*) will be as follows:

$$Y_t = \beta_0 + \beta_1 \cdot \text{Audit Opinion}_{t-1} + \beta_2 \cdot \text{Auditor Type}_{t-1} + \beta_3 \cdot \text{Audit Opinion}_{t-1} \cdot \text{Auditor Type}_{t-1} + \varepsilon \quad (1)$$

where,

$\beta_{0,1,2,3}$ are the parameters of the regression model,
Y is the dependent variable, with $Y \in \{FL, ROE, ROA, \text{Abs}(DAC)\}$,

and

$\varepsilon \sim N(0,1)$, a random variable, the error.

The proposed econometric model for testing the influence of the prior year audit opinion, as well as financial performance, leverage, and level of earnings management operations in the current year, on the probability of making a key audit matter on earnings management operations or going concern (including observations on compliance with the use of this principle in financial reporting) in the current year by auditor type (*Big4* and *Non-Big4*) will be as follows:

$$\ln(p_t/1-p_t) = \gamma_0 + \gamma_1 \cdot \text{Audit Opinion}_{t-1} + \gamma_2 \cdot \text{ROA}_t + \gamma_3 \cdot \text{ROE}_t + \gamma_4 \cdot \text{FL}_t + \gamma_5 \cdot \text{Abs}(DAC)_t + \gamma_6 \cdot \text{Auditor Type}_t + \varepsilon \quad (2)$$

where,

$\gamma_{0,1,2,3,4,5,6}$ are the parameters of the regression model,

p is the probability that the auditor will make a key audit matter regarding the existence of earnings management operations or a going concern opinion (including observations on compliance with the use of this principle in financial reporting),

and,

$\varepsilon \sim N(0,1)$, a random variable, the error.

A description of the variables used in the proposed econometric models is presented in **Table no. 2**, from which it can be seen that of the eight variables identified, four variables are qualitative (audit opinion, auditor type, key audit matters on earnings management operations, key audit matters on going concern) and four variables are quantitative, namely ROA, ROE, FL and Abs(DAC).

Table no. 2. Description of the variables used in the proposed econometric models

Variable	Categories	Explanation/Description
Audit Opinion	UO = 1	Unqualified Opinion
	MO = 0	Modified Opinion (Qualified Opinion, Adverse Opinion, Disclaimer of Opinion)
Auditor Type	B4 = 1	Big 4
	NB4 = 0	Non Big 4
ROA	-	Return on Assets (Operating Income/Total Assets - 100)
ROE	-	Return on Equity (Net Income/Equity - 100)
FL	-	Financial Leverage (Total Debt/Equity)
Abs(DAC) (Absolute value of the discretionary accruals)	-	The working methodology proposed in Grosu M. et al. (2022) was used to calculate Abs(DAC), scaled by the operating income.
KAM EM	Yes EM = 1	Existence of key audit matters relating to earnings management operations (1 = Yes; 0 = No)
	No EM = 0	
KAM GC	Yes GC = 1	Existence of observations/key audit matters on going concern (1 = Yes; 0 = No)
	No GC = 0	

Source: own processing

For the sampled firms, data were collected manually from annual financial statements and published audit reports and analysed using SPSS 25.0. The audit report may refer to going concern matters both in the justification of the audit opinion and in the emphasis of matters paragraph. Mareque et al. (2017) find that, for the sample of unlisted Spanish firms they deal with, at the beginning of the 2008 crisis they find references to going concern rather in the amended opinion justification, while in 2010 these references appear in the observations paragraph.

4. Results and discussions

In the study, the main results obtained from the analysis of the data collected at the level of the

analysed sample are: the presentation of descriptive statistics related to the financial indicators included in the econometric models, the presentation of the distribution over time of audit opinions and key audit matters on earnings management operations and on going concern by category, the presentation of the distribution of key audit matters on earnings management operations and on going concern by category of auditors and the estimation of the parameters of the econometric models related to the two proposed research objectives.

Table no. 3 presents the main descriptive statistics (mean and standard deviation) for the financial indicators included in the analysis.

Table no. 3. Descriptive statistics on the financial indicators analysed

Variable		FL		ROA		ROE		Abs(DAC)	
Year	N	Average	Dev.std.	Average	Dev.std.	Average	Dev.std.	Average	Dev.std.
2012	37	-,537358	7,2816533	,019233	,0676005	,212267	,9573236	,303312	1,4153896
2013	37	,349383	4,4259509	,002596	,0896631	,097369	,5446346	,551656	2,9377615
2014	37	,132383	4,6003774	,026797	,0593324	,047637	,3963880	,082294	,0496726
2015	37	4,479103	22,8732338	,017888	,0816438	-,391145	2,3076811	,070049	,0156623
2016	37	-1,586236	9,9637806	-,012559	,2071052	,312837	1,8428436	,069462	,0082477
2017	37	-1,394382	5,5200200	,068239	,3587033	-,142317	2,9196109	,064740	,0161862
2018	37	-,615443	5,0220592	,020362	,1634999	,257062	,6952861	,074359	,0253667
2019	37	-,071418	3,0482240	,025127	,0948267	,070205	,1641720	,073572	,0299017
2020	37	2,001253	11,9679015	,017962	,0836426	,002017	,2849413	,075583	,0232407
2021	37	-10,787300	82,0787127	,068636	,2097909	,948910	5,7348759	,116189	,1824271
2022	37	1,389601	13,4700188	,026735	,0774347	,067494	,5386849	,077761	,0351428
Total	407	-,603674	26,6178626	,025547	,1612091	,134758	2,1784678	,141725	,9836555

Source: own processing in SPSS 25.0

From the data presented in **Table no. 3** it can be seen that at the level of the sample analysed for BSE listed firms, in the period 2012-2022, they show, on average, leverage ratio values, calculated on the basis of financial leverage (FL) of -0.603674. This value indicates, on the one hand, negative equity values due to losses carried forward and, on the other hand, the tendency of firms to finance their activity on debt. At the same time, high values of indebtedness were recorded in the years 2015, 2020 and 2021, with overunity values of FL, which indicates that the firms analysed are mainly financed by foreign resources and less by own resources. Also, high but negative FL values were recorded in the financial

years 2016, 2017 and 2021, indicating very high values of losses reported in relation to debt.

In terms of the return on assets (ROA), it can be seen that the average ROA of a firm in the sample analysed is 0.0255477, which implies that for every 100 monetary units of assets used in operating activity, they will generate 2.55477 monetary units in the form of future economic benefits. Negative values of this indicator, recorded in the 2016 financial year, describe the recording of losses by firms in operating activity.

For the return on equity (ROE), it can be seen that at the level of the sample analysed, a BSE-listed company has

an average ROE of 0.134758. This implies that for every 100 monetary units of capital provided by shareholders, they will be remunerated on the basis of dividends (as part of the net result) with 13.4758 monetary units. Negative values of this indicator for the financial years 2015 and 2017 reflect the recording of net losses.

For the indicator measuring the level of discretionary accruals, in absolute value, in relation to the operating income – *Abs(DAC)*, at the level of the sample analysed, it can be observed that, on average, a BSE listed company records values of this indicator of 0.141725. This value indicates on average a low value of discretionary accruals

in relation to the value of the operating income. The highest values, overunity, were recorded in 2012 and 2013 (when the value of discretionary accruals represents approximately 30% and 55% of the operating income, respectively), immediately after the transition to IFRS, and their level will decrease significantly over time.

Table no. 4 shows the distributions over time of the number of audit opinions by the two categories (modified – *MO* and unqualified – *UO*) as well as the number of key audit matters by the two main groups, namely those on the existence of earnings management operations – *EM* and those on going concern – *GC*.

Table no. 4. Distribution over time of audit opinions and key audit matters on earnings management operations and going concern by category

Year	No Observations / %	Audit Opinion		Total	KAM EM		Total	KAM GC		Total
		MO	UO		No EM	Yes EM		No GC	Yes GC	
2012	No cases	14	23	37	37	0	37	37	0	37
	% pe an	37,8%	62,2%	100,0%	100,0%	0,0%	100,0%	100,0%	0,0%	100,0%
2013	No cases	12	25	37	37	0	37	37	0	37
	% pe an	32,4%	67,6%	100,0%	100,0%	0,0%	100,0%	100,0%	0,0%	100,0%
2014	No cases	12	25	37	37	0	37	37	0	37
	% pe an	32,4%	67,6%	100,0%	100,0%	0,0%	100,0%	100,0%	0,0%	100,0%
2015	No cases	13	24	37	37	0	37	37	0	37
	% pe an	35,1%	64,9%	100,0%	100,0%	0,0%	100,0%	100,0%	0,0%	100,0%
2016	No cases	8	29	37	17	20	37	31	6	37
	% pe an	21,6%	78,4%	100,0%	45,9%	54,1%	100,0%	83,8%	16,2%	100,0%
2017	No cases	11	26	37	8	29	37	28	9	37
	% pe an	29,7%	70,3%	100,0%	21,6%	78,4%	100,0%	75,7%	24,3%	100,0%
2018	No cases	8	29	37	10	27	37	30	7	37
	% pe an	21,6%	78,4%	100,0%	27,0%	73,0%	100,0%	81,1%	18,9%	100,0%
2019	No cases	11	26	37	9	28	37	32	5	37
	% pe an	29,7%	70,3%	100,0%	24,3%	75,7%	100,0%	86,5%	13,5%	100,0%
2020	No cases	7	30	37	12	25	37	31	6	37
	% pe an	18,9%	81,1%	100,0%	32,4%	67,6%	100,0%	83,8%	16,2%	100,0%
2021	No cases	5	32	37	35	2	37	29	8	37
	% pe an	13,5%	86,5%	100,0%	94,6%	5,4%	100,0%	78,4%	21,6%	100,0%
2022	No cases	5	32	37	36	1	37	28	9	37
	% pe an	13,5%	86,5%	100,0%	97,3%	2,7%	100,0%	75,7%	24,3%	100,0%
Total	No cases	106	301	407	275	132	407	357	50	407
	% per year	26,0%	74,0%	100,0%	67,6%	32,4%	100,0%	87,7%	12,3%	100,0%

Source: own processing in SPSS 25.0

From the data presented in **Table no. 4**, for the categorical variable Audit opinion, the following can be observed: at the level of the sample analysed, for the period 2012-2022, unqualified audit opinions represented 74.0% of the total opinions expressed, and the remaining 26% were modified opinions (qualified opinion, adverse opinion, disclaimer of opinion). In terms of year

distribution, the data analysed show a higher percentage of modified opinions immediately after IFRS adoption (2012) and until 2020 (pandemic period), with percentages of more than 18%, and a significant decrease in the share of modified opinions post-pandemic.

With regard to key audit matters signaling the existence of KAM EMs, it can be seen from the data

analysed that immediately after the transition to IFRS and up to and including 2015, no such matters were reported for any of the companies analysed, as they were not required to be disclosed. With the financial year 2016 and up to 2020 (post-pandemic) such key audit matters were reported. For the key audit matters relating to compliance with the going concern principle (KAM GC), it can be seen from the data analysed that no continuity matters were mentioned by the auditor in the audit report in the period 2012 (with the transition to IFRS) and up to and including 2015, nor was it mandatory to present these matters as key audit matters (mentions in this respect could, however, be made). From the 2016 financial year onwards and especially during the

pandemic period and immediately afterwards, key audit matters relating to going concern were reported in more than 13-16% of cases.

In the analysis of the sample of firms we are dealing with, there is some carryover of KAMs submitted by the same auditor for the same firm from one year to the next. Lin & Yen (2022) studied this issue, on the case of Taiwanese firms, seeking to identify whether auditor change (rotation) influences this remanence; they found confirmation of the KAM change hypothesis, which proves a new perspective of the new auditor.

In terms of the number of key audit matters on earnings management operations and going concern, by auditor category, their distributions are shown in **Table no. 5**.

Table no. 5. Distribution of key audit matters on earnings management and going concern operations by auditor category

Auditor	No Observations / %	KAM EM		Total	KAM GC		Total
		No EM	Yes EM		No GC	Yes GC	
B4	No cases	46	19	65	65	0	65
	% per auditor	70,8%	29,2%	100,0%	100,0%	0,0%	100,0%
NB4	No cases	229	113	342	292	50	342
	% per auditor	67,0%	33,0%	100,0%	85,4%	14,6%	100,0%
Total	No cases	275	132	407	357	50	407
	% per auditor	67,6%	32,4%	100,0%	87,7%	12,3%	100,0%

Source: own processing in SPSS 25.0

From the data presented in **Table no. 5**, it can be seen that in the sample analysed, for 32.4% of the cases, key audit matters related to the existence of earnings management operations were reported and for 12.3% of the cases, matters related to going concern were reported. Of these, for those relating to earnings management operations, most cases were reported by *Non-Big4* auditors (113 cases), and for those relating to compliance with the going concern principle, all cases were also reported by *Non-Big4* auditors. Thus, a higher degree of professional skepticism can be observed for *Non-Big4* auditors than for *Big4* auditors.

In order to test and validate Hypothesis 1 and achieve the proposed research objective, the parameter estimates of the regression models related to Equation (1) are presented in **Table no. 6** (1).

Table no. 6 presents the parameter estimates of the regression models testing the influence of the previous year's auditor's audit opinion on the financial position and performance indicators (*FL*, *ROE*, *ROA*), including the one

on the existence of earnings management operations, i.e. *Abs(DAC)*.

At the level of the sample analysed, it can be observed that for BSE listed companies in the period 2012-2022, the auditor's audit opinion in the previous financial year does not have a significant influence on the leverage financial (*LF*) nor on the return on equity (*ROE*) in the current financial year, their values being independent of the type of opinion as well as of the auditor's membership in the *Big4* group of companies (at least for the year following the formulation of the audit opinion).

As regards the Return on Assets (*ROA*), from the data presented in **Table no. 6** it can be seen that the audit opinion from the previous financial year and the type of auditor have a significant influence on it. Thus, for firms to which modified opinions were given in previous financial years, the *ROA* values are 0.124 lower than for firms to which unqualified opinions were given. At the same time, firms audited in the past by *Non-Big4* auditors and for which modified opinions were given have *ROA* values

0.075 lower than firms for which unqualified opinions were given in the past but by auditors belonging to the *Big4* group. It can be concluded that the type of opinion

previously given and the auditor's membership of the *Big4* group of firms have a significant influence on the ROA in the current financial year.

Table no. 6. Parameter estimates of regression models related to Equation (1)

Model	Dependent Variable: FL		Dependent Variable: ROE		Dependent Variable: ROA		Dependent Variable: Abs(DAC)	
Parameter	B	Std. Error	B	Std. Error	B	Std. Error	B	Std. Error
Intercept	,666	4,041	,042	,330	,053*	,024	,509	,149
[Opinion _{t-1} =0]	-2,865	7,300	,309	,597	-,124*	,044	-,440**	,270
[Opinion _{t-1} =1]	0 ^a	.	0 ^a	.	0 ^a	.	0 ^a	.
[Auditor _{t-1} =0]	1,283	4,409	-,139	,360	-,009	,026	-,433*	,163
[Auditor _{t-1} =1]	0 ^a	.	0 ^a	.	0 ^a	.	0 ^a	.
[Auditor _{t-1} =0] * [Opinion _{t-1} =0]	-4,738	7,893	,362	,645	,075**	,047	,509**	,291
[Auditor _{t-1} =0] * [Opinion _{t-1} =1]	0 ^a	.	0 ^a	.	0 ^a	.	0 ^a	.
[Auditor _{t-1} =1] * [Opinion _{t-1} =0]	0 ^a	.	0 ^a	.	0 ^a	.	0 ^a	.
[Auditor _{t-1} =1] * [Opinion _{t-1} =1]	0 ^a	.	0 ^a	.	0 ^a	.	0 ^a	.
	R squared = 0,016		R squared = 0,019		R squared = 0,038		R squared = 0,018	

* significant values for a risk of 5%; ** significant values for a risk of 10%

Source: own processing in SPSS 25.0

With respect to the absolute discretionary accruals, from the data presented in **Table no. 6**, the following can be observed: both the prior year audit opinion and the auditor's membership in the *Big4* group of firms, and the cumulative effect of these, have a significant influence on the level of absolute discretionary accruals in the current year, similar to other studies (Alzoubi, 2016; Campa, 2019; Buchanan et al., 2021; Viana Jr. & Lourenço, 2022). Thus, firms for which a modified opinion was given in the previous financial year tend to reduce their level of discretionary accruals by 0.440 in the next financial year. Firms audited in the past by auditors not belonging to the *Big4* group of companies also have a 0.433 decrease in discretionary accruals in the next financial year. However, firms audited in the past by *Non-Big4* auditors and

for which modified opinions have been given in the past have increases in discretionary accruals in the next period, implying a deterioration in transparency in financial reporting.

In order to test and validate Hypothesis 2 and achieve the related research objective, **Table no. 7** presents the parameter estimates of the regression models related to Equation (2). Thus, it is proposed to apply logistic regression analysis for the case of econometric models assessing the influence of the prior period audit opinion as well as the proposed financial indicators on the probability that the financial auditor will report in the current period a number of key audit matters regarding the existence of earnings management operations or those regarding going concern.

Table no. 7. Parameter estimates of regression models related to Equation (2)

Model	Dependent Variable: ln(pKAM EMt/1-pKAM EMt)		Dependent Variable: ln(pKAM Gct/1-pKAM Gct)	
Parameter	B	S.E.	B	S.E.
Opinion _{t-1} =1	-,709*	,247	,272	,352
ROA	1,054**	,805	-1,898**	1,155
ROE	,067	,115	,237	,201
FL	,014	,013	,041*	,020
Abs_DAC	-2,078	2,701	-10,421	7,790
Auditor(1)	,150	,302	-1,431	,601
Constant	-,524	,352	,272	,352
	Nagelkerke R Square = 0,056		Nagelkerke R Square = 0,124	

* significant values for a risk of 5%

** significant values for a risk of 10%

Source: own processing in SPSS 25.0

Table no. 7 presents the parameter estimates of the logistic regression models testing the influence of the previous year's audit opinion, financial position and performance indicators (*FL*, *ROE*, *ROA*), including the existence of earnings management operations, i.e. *Abs(DAC)*, and the auditor's membership of the *Big4* group of firms on the probability of reporting key audit matters on the existence of earnings management operations or going concern.

In terms of the probability of reporting key audit matters on the existence of earnings management transactions, it can be seen that by giving an unqualified audit opinion in the previous financial year, the probability of reporting a key audit matter on EM in the next financial year will decrease, in line with the results of other studies (Alzoubi, 2016; Buchanan et al., 2021). This helps to strengthen discipline in financial reporting, as well as increasing transparency in financial reporting following the giving of the audit opinion. Moreover, high *ROA* values in the current year may be red flags of possible earnings management operations under the action of opportunity factors, as per *ISA 240-Auditor's responsibility to consider fraud in an audit of financial statements*, as demonstrated by other authors in their studies (Kothari et al., 2005).

For key audit matters of going concern (KAM GC), the probability of their signature by the auditor in the current financial year is significantly influenced by the level of *ROA* and *FL* as pressure factors, as per *ISA 240-Auditor's responsibility to consider fraud in an audit of financial statements*. Thus, these signal indicators may indicate possible malfunctions in the operating activity, such that negative *ROA* values will lead to an increased probability of reporting a key audit matter on going concern. At the same time, the increase in leverage will also lead to an increase in the probability of reporting key audit matters related to going concern in the current period, similar to the results reached by other researchers (Aguilar et al., 2018).

5. Conclusions

This research aimed to show the role of the financial auditor in improving transparency in reporting and as an active player in enforcing a sustainable reporting discipline. It is well known that the audit opinion given by the financial auditor should provide a high degree of credibility for companies' financial reporting (there is also the option to move to a reasonable assurance

engagement for non-financial information as well, but at a later stage – Ernst & Young, 2022). Given the reputational risks, it is in the auditor's best interest to identify and assess as accurately as possible the risks to audited companies.

The study had two objectives translated into research hypotheses:

1. to test the influence of audit opinion type and auditor membership (*Big4/Non-Big4*) on financial position and performance and earnings management practices;
2. to test the influence of the audit opinion in conjunction with the influence of important financial indicators on the probability that the auditor will include in the audit report key matters relating to earnings management practices or affecting the going concern principle.

The results show that these influences are generally significant.

In order to test the influence of the auditor's audit opinion of the previous financial year on the indicators of financial position and performance, including that of the existence of earnings management operations, at the level of the sample analysed, it could be found that, for BSE listed companies in the period 2012-2022, the auditor's audit opinion of the previous financial year as well as its type (*Big4/Non-Big4*) have a significant influence on the return on assets (*ROA*) of the current financial year. Specifically, firms to which modified opinions were given in previous financial years have lower *ROA* values than firms to which unqualified opinions were given, and firms audited in the past by *Non-Big4* auditors and for which modified opinions were given have lower *ROA* values than firms for which unqualified opinions were given in the past but by *Big4* auditors. In terms of discretionary accruals, both the prior year audit opinion and the auditor's membership of the *Big4* group of firms, and the cumulative effect of these, have a significant influence on the level of discretionary accruals in the current year. The deterioration of transparency in financial reporting, through an increase the discretionary engagements occurs against the background of auditors not belonging to the *Big4* group and having given modified opinions in the previous period.

Testing the influence of the prior period audit opinion as well as the financial indicators considered on the probability of the financial auditor reporting a number of key audit matters on the existence of *EM* in the current period evidences that the giving of an unqualified audit opinion in the prior financial year decreases the probability

of reporting a key audit matter on *EM* in the next financial year. While this contributes to improved discipline and transparency in financial reporting, the high *ROA* values in the current year may signal the existence of possible earnings management operations under the action of opportunity factors. Testing the influence of the financial indicators considered on the likelihood that the financial auditor will report in the current period on a number of key audit matters related to going concern shows that both *ROA* and *FL* have a significant influence and are considered as pressure factors. In other words, the increased probability of reporting a key audit matter on

going concern may be influenced by inadequate return on assets and leverage.

The additional knowledge that this study brings, in addition to developing the audit-sustainability relationship, also aims to consider some key audit matters as variables included in the category of earnings management operations, and the results obtained may be useful both to accounting professionals in their audit assignments and to other researchers for the development of future studies. Certainly, the study carried out also has limitations, as the sample analysed is quite small, which affects the generalizability of the results, but it could be extended in a future research.

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Corporate Reporting Quality in Light of the New Sustainability Standards.

Content Analysis based on Environmental, Social, and Governance Factors

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Abstract

In recent decades, more and more researchers and practitioners have expressed their interest in sustainable development and sustainability. Since it was introduced in 1987, the concept of sustainable development has been treated by the United Nations in various ways, which are of reference not only to countries but also to companies. However, a clear understanding of how organizations should address sustainability is still missing, despite all efforts to encourage companies to improve their triple balance sheet. Today, sustainability reporting has become a common practice among the world's leading companies as individuals are increasingly taking environmental, social, and governance (ESG) factors into account in their investment decisions. Nevertheless, adapting to a business environment where responsible investment becomes the rule poses several challenges to organizations. Even though transparency and non-financial reporting are gradually gaining ground and receiving more and more attention in Europe, there is still considerable emphasis on financial reporting in the eastern part of the continent. Consequently, in this paper, the authors are looking to identify how several selected companies listed on BVB (Bucharest Stock Exchange) (from different industries) take into account ESG values. They achieved their goal by conducting a content benchmark analysis, which emphasized the similarities and differences between the reports of the companies included in the analysis, issued over different periods. Last but not least, there were highlighted the standards and the non-financial reporting tools considered in the analysis carried out.

Key words: sustainability; corporate reporting; non-financial reporting; Bucharest Stock Exchange;

JEL Classification: G30, Q01, R11

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1. Introduction

Sustainability is one of the greatest challenges of the present time. Issues such as poverty, climate change, and excessive use of resources are of interest to an increasing number of individuals, governments, and organizations. As a result, companies began to feel pressured to report their performance in this regard to all stakeholders.

In the business environment, sustainability is the integration of strategies and activities that allow to meet the current needs of the company and its stakeholders, without prejudice in the future to the natural and human capital that the company needs (IISD et al., 1992). Stakeholders, therefore, expect better products and services with a minimal negative impact on society and the environment. Such requirements apply not only to all branches of business but also to business partners.

2. Relevant literature

Sustainability reporting has been increasingly adopted by corporations around the world given the demand from stakeholders for greater transparency on both environmental and social issues. The popularity of such reporting is proved by the development of a range of tools over the past two decades, such as the Global Reporting Initiative (GRI), AA1000, and the Carbon Disclosure Project (CDP), among others. These tools, collectively referred to as Corporate Sustainability Reporting Tools (SRTs), are important as they serve to inform corporations' progress toward reaching sustainability goals (Renard, 2015). At the European level, more and more importance is being attached to the legislation governing sustainability and sustainable development issues. In this regard, the European Parliament adopted in 2022 the new sustainability directive amending the current non-financial reporting directive, the scope of which is considerably expanded in response to the accelerated environmental degradation (Bunget et. al., 2022). On the other hand, however, for the implemented sustainability practices to be successful, they must be part of the organizational culture and not be used only to improve the image in the market (Kam and Kim, 2022).

In an ideal world, analysts and individuals, in general, would always have access to financial reports based on sound financial reporting standards, such as those from the International Accounting Standards Board (IASB) and

the Financial Accounting Standards Board (FASB). But, in practice, the quality of financial reports may vary considerably. **High-quality financial reporting** provides information that is useful in evaluating a company's performance and prospects. On the other hand, low-quality financial reporting contains inaccurate, misleading or incomplete information (CFA Institute, 2022).

Shortcomings in the quality of financial reporting have given rise to large-scale **scandals** that have led not only to investor losses but also to a decrease in confidence in the financial system. In this case, those who were able to accurately assess the quality of financial reporting were better positioned to avoid losses. Such shortcomings illustrate the challenges facing analysts (but not only), as well as the potential costs of not recognizing practices that lead to misleading or inaccurate financial reports. Examples of misreporting can provide insight into various signals that may indicate poor financial reports. Let us recall the Enron case, where James Chanos was the one who had admitted the errors within the company as early as November 2000 (CFA Institute, 2022) – more than a year before Enron filed for bankruptcy protection (in December 2001).

On the opposite end, high-quality reporting provides information that is useful for decision-making, is relevant, and represents the economic reality of the company's activities during the reporting period, as well as the company's financial situation at the end of the financial year.

The quality of financial reporting can be considered as a **continuum**, which ranges from the highest quality (containing relevant, accurate, complete, and unbiased information) to the lowest quality (containing information that is not only biased or incomplete, but can also be fabricated).

One aspect of the quality of financial reporting is the degree to which accounting choices are conservative or aggressive. The term "aggressive choices" refers to those choices that aim to improve the reported performance and financial position of the company by exacerbating the revenues, earnings, and/or operational cash flows reported during that period, or by decreasing the expenses related to the period and/or the amount of liabilities reported in the balance sheet.

The motivations behind issuing low-quality financial reports include hiding low performance, increasing/maintaining stock prices, or increasing personal compensation.

Mechanisms that discipline the quality of financial reporting include the free market and the incentives offered to companies to minimize auditor costs, or provisions/policies that are specifically tailored to avoid misreporting.

To support the quality of financial reporting, **institutional efforts** have also been made, through the International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB). In Romania, a growing number of companies are adopting the International Financial Reporting Standards (IFRS), either as a basis for accounting or as parallel reporting – voluntarily or as a result of legal requirements (KPMG, 2022). The benefits of IFRS include increased comparability, as well as better transparency of financial reporting.

3. Sustainability and non-financial reporting

For companies, sustainable development and sustainability mean adopting activities and strategies that meet the needs of the company and its stakeholders, protecting the human and natural capital needed for the company in the future (IISD et al., 1992). Since 2000, the United Nations (UN) has encouraged companies around the world to adopt sustainable practices and policies and to report their results following their implementation. This was made possible by the United Nations Global Compact. A few years later, in 2016, the UN set up the SDG Business Forum that addressed the Sustainable Development Goals (SDGs) to better understand the links between social values and the efforts of enterprises to enhance the quality of life in their respective communities and beyond. Moreover, the UN has even developed an indicative guiding tool for companies, aimed at providing support in implementing the SDGs (United Nations, 2015). The guide aims to assist companies in aligning their strategies to sustainable development and to help them measure and manage their results. It also addresses five steps as follows: (1) understanding the SDGs, (2) defining and setting priorities, (3) setting targets, (4) integrating SDGs and (5) reporting results.

As global sustainability is based on sustainable development at the micro level, organizations are increasingly expected to contribute to SDGs, regardless of their size. Technological progress and innovation are indeed necessary to harness sustainable development,

but they are not enough to change the course of organizations toward sustainable development (Anadon et al., 2016). As a result, there is a need to find and develop new business solutions (that are both competitive and integrative).

Currently, several active organizations are working to help companies with sustainable development. The World Business Council for Sustainable Development (WBCSD) is one of them, operating internationally and bringing together more than 200 leading companies from around the world and across multiple sectors. WBCSD aims to collaborate with businesses on sustainable development issues and also seeks to create solutions that impact business in this regard. Such efforts also come from the Global Reporting Initiative (GRI), which is another international organization focused on understanding and communicating the impact of enterprises on sustainable development through the GRI standards. These standards provide how companies can understand their triple balance sheet and measure it by universal standards (GRI 101, GRI 102, GRI 103) or specific standards (GRI 200, GRI 300, GRI 400). The GRI standards are considered public goods free of charge and are used in over 90 countries by thousands of entities (Global Reporting Initiative, 2019).

Furthermore, working with the WBCSD and the United Nations Global Compact, GRI has issued a reporting guidance tool called SDG Compass, which assists in addressing the SDGs. SDG Compass aims to help organizations align their strategies to sustainable development and understand and measure their contribution thereto.

In today's business environment, more and more leaders adhere to the principles of sustainable development (Bonini, 2012), while many companies refer to sustainable development as a strategic component of their business. A McKinsey study of $n = 2,904$ (2014) revealed that 43% of companies seek to align their mission, values, and goals with those of sustainable development.

Corporate responsibility reporting has become a common practice for the world's largest companies, and their actions toward sustainability seem to be a good predictor of company practices in the industry in general. According to KPMG (2017), about three-quarters of the companies included in a study ($n = 4900$) issue corporate responsibility reports. Other results indicated that, in 2017, each sector in the industry reached a reporting rate that exceeded 60%. The reporting rate of the top 250

companies in the Fortune 500 in 2016 has remained stable since 2011 when it reached a historic peak at 95% (KPMG, 2017).

In Europe, despite a growing reporting trend, there are notable differences between Western and Eastern Europe. Many companies in Eastern Europe are still focused on achieving satisfactory financial results, at the expense of the triple balance sheet (KPMG, 2017). In Romania, an increase of six percentage points was recorded in the 2017 reporting compared to the one in 2015, which can be explained by the transparency levels of multinational companies operating in the country. However, Romania is among the countries that recorded a corporate responsibility reporting rate above the global average, of 68% in 2015, and 75% in 2017 (KPMG, 2017).

Although analysts encourage the flexibility granted by the directive to governments in adopting corporate reporting regulations, they believe that the business environment should move toward an international model that ensures consistency between reports (KPMG, 2017). Of the 250 companies included in the KPMG study, 89% use a guide and model for reporting. The GRI model is found in most companies (75% of respondents said they apply the GRI standards). Moreover, the UN-proposed SDGs have strongly resonated with companies, given that this happened less than two years after they were launched (KPMG, 2017). As a result, four out of ten reports included in the study relate to SDGs, suggesting the importance that SDGs will gain in the years to come.

Since 2004, after UN Secretary-General Kofi Annan called on businesses to implement universal principles, investors have started turning their attention to measuring performance in areas such as environmental, social, and governance (ESG). Today, ESG has become an important criterion for investors, being increasingly integrated into organizations' practices. In 2017, ESG investments reached USD 23 billion, representing a 25% increase from 2015 levels and accounting for a quarter of global investments (Bloomberg, 2017).

The growth was also supported by the leaders' interest in responsible investment. Currently, an increasing number of investors are following ESG data, in addition to the financial performance of companies (KPMG, 2019). In addition, studies indicate that the implementation of ESG policies does not only translate into efficiency but also into better financial results. Therefore, companies that actively engage in sustainable practices achieve better results than those that do not integrate the ESG aspects into their

operations. According to a study conducted by Morgan Stanley (2019), out of a total of 1000 investors surveyed, 75% expressed an interest in investing in sustainability, while 71% felt that companies that focus on social and environmental objectives were achieving better results.

The increasing impact of ESG on the business environment is taking place as the legislative environment improves, which imposes increasing demands on aspects relating to ESG and reporting transparency. However, industry leaders understand that these demands only act as a starting point of the trend and that, to deliver satisfactory long-term results, they must maintain a proactive attitude so that they go further than just conforming to an ESG model (KPMG, 2019).

4. BVB non-financial reporting. Content analysis based on ESG factors

Having presented the theoretical application method in terms of corporate responsibility reporting, we would like to present an analysis of the content of the non-financial reports issued by the top ten companies listed on the Bucharest Stock Exchange (depending on the traded value recorded by these companies in the period 2019 – 2020) on how they incorporate sustainability considerations into their reporting. It is obvious that this top of the first 10 traded companies according to the traded value will change in 2023 (the year of drafting this paper), but the reference of the analysis will be the top companies in the period 2019 to 2020.

The main objective of the analysis is **to identify how these companies listed on BVB take into account the ESG values**, by examining their non-financial reports for 2019 and comparing them with the reports published in 2023 for the previous year.

To have a better understanding of the investment options they have, investors often take into account ESG (environmental, social, governance) data in their decision-making process. The reason for this consideration revolves around material risks and growth opportunities. Today, although ESG values are voluntarily addressed by companies in their mandatory financial reporting (or, separately from it, in the board of directors' reports or supervisory boards' reports), companies have started to use them more and more.

The definition of materiality is still ongoing and notable institutions, such as the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB), are working to clarify how ESG can be incorporated into reporting. Therefore, to date, there is no universally accepted list of ESG examples, especially since these factors are often interconnected. However, a general classification includes the following: (1) Environmental factors, i.e. addressing the preservation of the natural world through variables such as carbon emissions, water/air pollution, deforestation, energy efficiency, or waste, (2) Social factors, involving consideration of people through diversity, community relations, human rights, labour standards or customer satisfaction, (3)

Governance, which refers to standards of enterprise management, such as bribery and corruption, involvement in politics, board of directors composition, or mechanisms for reporting unethical behaviour (Hayat and Orsach, 2015).

5. Research Methodology

The study is based on the methodology of content analysis. The criterion for choosing the top ten companies was based on the total value traded and the period considered was one year, from October 2019 to October 2020 (Table no. 1).

Table no. 1. Top ten companies listed on BVB according to the value traded between October 2019 and October 2020

Company	Value (RON)	Industry
Banca Transilvania S.A.	2,899,164,080.23	Banking
Fondul Proprietatea	1,423,325,765.62	Investment management
S.N.G.N. Romgaz S.A.	1,005,202,015.30	Energy
OMV Petrom S.A.	935,439,064.85	Oil and gas
BRD – Groupe Societe Generale S.A.	930,893,396.18	Banking
Societatea Energetica Electrica S.A.	545,468,079.57	Energy
S.N. Nuclearelectrica S.A.	406,161,807.62	Energy
Erste Group Bank AG	360,850,726.17	Banking
S.N.T.G.N. Transgaz S.A.	285,762,774.00	Energy
C.N.T.E.E. Transelectrica	215,937,802.70	Energy

Source: BVB (2020)

This top of the first 10 companies traded between 2019 and 2020 was updated in 2023 with the migration of investors' interest to other areas that thrive for various reasons over a certain period (e.g.

the energy industry). Therefore, the first 10 companies listed on BVB according to the value traded in the period 2022-2023 are presented in Table no. 2.

Table no. 2. Top ten companies listed on BVB according to the value traded between June 2022 and June 2023

Company	Value (RON)	Industry
OMV Petrom S.A.	2,480,595,910.80	Oil and gas
Fondul Proprietatea	1,993,276,311.45	Investment management
Banca Transilvania S.A.	1,494,806,004.95	Banking
S.N.G.N. Romgaz S.A.	553,354,971.75	Energy
S.N. Nuclearelectrica S.A.	387,788,751.40	Energy

Company	Value (RON)	Industry
BRD – Groupe Societe Generale S.A.	374,343,153.46	Banking
ONE UNITED PROPERTIES	217,527,355.95	Real estate
Evergent Investments S.A.	186,088,313.02	Investment management
Erste Group Bank AG	159,255,033.90	Banking
Med Life S.A.	149,458,569.98	Medical

Source: BVB (2023)

As we can see from the data extracted in the two tables, in 2023, the companies S.N.T.G.N. Transgaz S.A. and C.N.T.E.E. Transelectrica left the top and were replaced by Evergent Investments S.A. and Med Life S.A. At the same time, the banking sector fell in 2023 from the first position; thus, Banca Transilvania has recorded this year a traded value lower by more than 1.4 billion RON. It is also worth noting that, in 2023, investors concentrated their monetary resources in the top 3 companies in different sectors of activity, while in 2020 investments were distributed more homogeneously.

Further in the analysis, we will use as reference the data recorded between 2019 and 2020, although the top of the 10 companies has changed, because we are looking to see if the approach of the ESG factors present in the company reports has any impact on the transactions recorded by these companies.

Due to the partially immeasurable or qualitative content of the analysed elements, we were unable to perform a more detailed statistical analysis of the data. The main purpose of the study is to understand the evolution of non-financial reporting in Romania, without any intention to generalize the obtained results.

6. Analysis results

Starting with **Banca Transilvania** (BT), it is noted that the bank issued a report for 2019 entitled “Non-Financial Environmental, Social and Governance Report”, the content of which was based on the GRI guide (Banca Transilvania, 2019). The environmental factors considered were reforestation actions, noting that the bank was given as an example in financing environmental projects at the Global Climate Forum. However, the report did not accurately indicate which other variables were measured and monitored in this respect. The social factor revealed that the bank reports

aspects such as investments in community projects (RON 25 million), staff turnover (15.6%), employee diversity (85% women in management positions), training and development programs for employees, and internship programs for students.

Regarding the governance factor, it was noted that BT chooses its suppliers and partners according to the way they comply with the bank’s principles, does not tolerate bribery, corruption, influence peddling, and money laundering, and ensures the monitoring of transactions. In 2023, the bank dedicated a well-defined chapter to sustainability in its annual report; thus, the information contained in “Chapter 6 – Sustainability & ESG” (BVB, 2023) is much better structured and presented compared to the 2019 report. Regarding environmental protection, BT brings to the forefront the green loans granted: “In 2022 Banca Transilvania took an important step toward intensifying the efforts of sustainable financing of its clients by setting up the Green and Sustainable Loans Department, specially created to coordinate and mark the sustainable lending activity addressed to companies.” In 2022, 371 green loans were granted by BT, amounting to RON 790 million, with a considerable increase in this type of loans granted to companies. Although, at the level of the banking financial system, the environmental impact is largely indirect, generated by the projects that the Bank chooses to finance, the administrative activity in the day-to-day operations also generates a negative impact on the natural environment, especially through the consumption of materials and generated waste. Proper waste management and a low rate of waste that ends up in landfills or is incinerated without energy recovery contribute to the reduction of the negative impact (BVB, 2023). For this purpose, the consumption of paper, fuel, energy, etc. is presented.

Regarding the social factor in 2023, the bank reports the structure of the team that totals over 12,000 employees and brings to the forefront the specialized training that exceeds 77 hours of training/employee. Regarding the

governance factor, comparing the sustainability reports from the two analysed periods, we cannot notice any new differences or trends from this perspective.

Fondul Proprietatea is one of the analysed companies that does not report its non-financial activity. However, some information on the governance factor has been extracted from the Sole Director's Annual Report (2019). The findings indicate that Fondul Proprietatea fully complies with the BVB Governance Code. It also has in place a transparent decision-making process and clear rules and policies for the prevention of conflicts of interest, insider trading, money laundering, and terrorist financing.

Last but not least, the company has a distinct department for managing its relationship with investors (Fondul Proprietatea, 2019). In 2023, Fondul Proprietatea has not published any report on non-financial activity, but in the annual report (of 2023) aspects related to the EU regulation on the establishment of a framework to facilitate sustainable investment are dealt with superficially under Chapter 7 "Environment, Social and Governance". Although these EU regulations in force are mentioned, in the report we find that Fondul Proprietatea does not take into account EU criteria: "Investments undertaken by Fondul Proprietatea do not take into account EU criteria for environmentally sustainable economic activities, including facilitation or transition activities, within the meaning of the Taxonomy Regulation" (Fondul Proprietatea, 2023).

For **Romgaz**, the Sustainability Report issued for 2019 is the third such report. The company has implemented the Environmental Management System ISO 14001: 2015, as well as the Energy Management System ISO 50001: 2011. The total consumption of gas from renewable sources increased compared to the previous year, while the total consumption from conventional sources decreased (Romgaz, 2019). As mentioned in the report, Romgaz is concerned with biodiversity management (however, how it is concerned is not quite clear). As regards other variables relevant to the environmental factor, Romgaz monitors its activity and reports information on water management (lower consumption levels in 2019 compared to 2018), greenhouse gas emissions (lower direct emissions, but higher indirect emissions compared to 2018), and waste disposal (higher volumes of waste in 2019 compared to 2018), for which it also has in place a prevention policy (reuse/preparation for re-use/recycling). As a disadvantage, Romgaz has no approach to managing climate change risks, according to the report.

Regarding the social factor, Romgaz implemented the health and safety at work management system ISO 45001: 2018, and, in 2019, its health and safety targets were achieved at a rate of 100% (mainly involving legal requirements). Moreover, accidents and occupational diseases, sick leave, and absenteeism rates fell in 2019 compared to the previous year. The company has made progress in closing the gap between men's and women's pay levels, which are now slightly disproportionate in favour of men; the company also offers a higher minimum wage level compared to the amounts granted in the sector. 75% of the persons employed in senior management positions come from the local community, but out of a total of 5738 employees, 85% are men.

The company provides training and development programs for its employees and does not tolerate discrimination based on age, sex, disability, ethnicity, race, sexual orientation, political or religious opinions, or trade union affiliation. For the local community, Romgaz has shown its support by financing projects in the fields of health, education, sport, culture, or environment (with a budget of over RON 19 million). In terms of governance, Romgaz reports on the compliance with and application of its Code of Ethics adopted in 2018 and promotes values and principles regarding conflicts of interest, trading, compliance with competition law, corruption, and fraud prevention. It also requires suppliers to have minimum environmental criteria.

In structuring its non-financial report, Romgaz referred to the GRI and SASB standards.

The sustainability report published in 2023 is similar and comprehensive. We can easily see that, during the analysed period, the company has achieved its social environment and governance objectives. Therefore, the social factor represents an important matter for Romgaz; as a result, there were no increases in the number of accidents at work, and sponsorship expenses exceeded RON 24 million in 2023, most of these amounts being redirected to the medical and educational field (education, schooling, social and sports). As expected, the environmental targets are to reduce greenhouse gas emissions from current operations (a decrease of up to 10% by 2030 compared to 2020 is estimated). Regarding the use of water in the current activity, the company states that the volume of water recycled and reused increased 8 times from 2019 to 2022 (over 80 million m³ of water recycled for reuse in 2022). At the end of the 2023 sustainability report, all indicators of the GRI 2022 standards are presented as being met.

OMV Petrom has the most comprehensive non-financial reports in the analysed period. For 2019 it published a sustainability report that followed the SDGs and the GRI standards. It also developed a sustainability strategy for 2019-2025, with measurable targets in the following areas: (1) Health, Safety, Security, and Environment (HSSE), (2) Efficient CO₂ Emission Management, (3) Innovation, (4) Employees and (5) Business Principles and Social Responsibility (OMV Petrom, 2019).

In 2023, OMV Petrom is included in the list of ESG companies with the best rates of 2023, established by Sustainalytics. For the environmental factor, the company reports its CO₂ emissions (which have fallen by 22% since 2010), energy consumption (consumption levels lower than in 2018), environmental spending (higher than in 2018), water management (consumption volumes lower than in 2018), number and volume of substance leakage (lower than in 2018), waste management (higher amount generated than in 2018). OMV Petrom has implemented the Environmental Management System ISO 14001: 2015 and the Energy Management System ISO 50001: 2011. According to the report, its environmental spending was directed to energy efficiency in Romania (EUR 4 million), the implementation of innovative technologies (EUR 65 million), and the company's operational infrastructure (EUR 50 million). Regarding biodiversity, OMV Petrom manages its activities to generate minimal impact on the flora and fauna of protected areas and even developed an application that helps identify protected species in its operational areas. In terms of the social factor, OMV Petrom has developed the 2021+ People Strategy, which includes five principles (team spirit, responsibility, passion, pioneering, and performance). The company promotes diversity and inclusion (68.23% Gen X employees; 20.47% Baby Boomers; 10.68% Gen Y; 0.62% Gen Z; 26.3% women in managerial positions). Approximately 11,000 employees received more than 272,403 hours of training in professional development, ethics, or human rights in 2019. More than 25,443 medical examinations of employees were carried out, while the rate of work-related incidents fell since 2018.

The company has focused on providing community support, that reached 170,000 beneficiaries (EUR 13 million); it also supports the vocational training system in Romania through educational programs, scholarships, internships, and more. Moreover, in 2019, OMV Petrom settled 809 of a total of 906 complaints (mainly related to environmental protection). Regarding the governance

factor, the company complies with most of the requirements of the BVB Governance Code. It also complies with its code of business ethics through zero tolerance for corruption, rules on conflicts of interest, or compliance with competition laws. To enable reporting of non-ethical conduct, it has established an anonymous reporting mechanism. Its suppliers must also address sustainability principles (e.g. reduce associated risks along the value chain in terms of forced labour, human trafficking, or corruption), while strategic suppliers are assessed based on ESG values. Finally, to identify the main sustainability topics addressed in the reporting, OMV Petrom worked with internal and external stakeholders.

BRD, the company occupying the fifth position in the top (in 2020), reported its non-financial activity through a statement included in the annex to its annual report both in 2020 and in 2023, and its content was the most satisfactory among those of the companies in the analysed banking industry, especially because of how it reported progress through a variety of indicators. BRD is committed to aligning its financial portfolio with climate change issues, in line with the International Energy Agency (IEA).

In 2019, it launched two environmental initiatives: (1) the BRD Forest Fund, through the financing of forest protection in Romania, and (2) an educational and ecological program for schools in urban areas that aims to transform their outdoor spaces into green spaces (BRD, 2019). Moreover, in 2017 it committed to raise EUR 100 billion for the energy transition between 2016 and 2020, for which it achieved 69% of the target by 2020. Moving to the current year, BRD aims to accompany its customers in the energy transition toward a more sustainable future, and, following the achievement in advance of its targets, in 2022, Societe Generale strengthened its commitments to contribute EUR 300 billion to sustainable financing by 2025. As part of this commitment, BRD aims to contribute to this collective effort with sustainable financing transactions worth EUR 1 billion, which will be concluded by the same date, under its Horizon 2025 program. The company's results for 2019 show that it succeeded (compared to 2018) to reduce its CO₂ emissions, reduce the amount of paper used, reduce the amount of gas consumed, but maintained the amount of waste generated, while the levels of electricity used, the amount of non-recycled waste produced, water consumption and the distances of business travel increased. BRD policies include those that seek to exclude oil exploration and

extraction projects in the desert and Arctic areas. It also applies the Equator principles, according to which it assesses environmental and social risks for projects exceeding EUR 10 million. Regarding the social factor, BRD registered a staff turnover rate of 17.4% in 2019, with 68% women in managerial positions. Its employees have benefited from development programs (e.g. on personal development or the company code of conduct) and corporate volunteering (2300 volunteers involved in 50 projects), while the company maintains permanent communication with the trade union. BRD also cooperates with the public education system in Romania, integrating financial courses into the curricula of various institutions. In addition, the company invests in society in areas such as education, technology, culture, sports, solidarity, environment, and communities (over RON 10 million that reached over 50,000 beneficiaries).

Regarding the governance factor, BRD applies the BVB Code of Corporate Governance principles, in addition to its governance code. This code regulates the management of conflicts of interest and ethical and lawful operation. The company seeks to combat corruption through ABC (Anti-Bribery and Corruption) Governance, for which it has trained more than 400 persons, and established dedicated anti-fraud structures, for which it has trained more than 600 persons. Last but not least, BRD aims to maintain a close relationship with shareholders through constant, honest, and fast communication.

The next company in the top is **Electrica**, which since 2015 has issued annual sustainability reports. The report complies with the GRI and European Union (EU) standards and incorporates objectives and strategies for the period 2019-2023 (Electrica, 2019). It follows from its examination that the report has several strengths, such as addressing new concepts. For the environmental factor, Electrica implemented the ISO standard regarding the environmental management system and continued to implement the Lean methodology. The company aligned its operations with the European Green Deal to contribute to the continent's goal of becoming carbon neutral (e.g. investments for distribution and operational efficiency in the modern infrastructure). The company has diversified its service portfolio to help reduce CO2 emissions (based on renewable energy through the inteGRIDy project).

Other investments relate to biodiversity (for example, about RON 3 million for reforestation and isolation of infrastructure harmful to birds). By monitoring its waste

generation activity, Electrica reported that, in terms of hazardous waste, 48% were recycled, 42% were temporarily stored for further recycling (or disposal), 8% were safely stored and less than 2% were incinerated.

The data published in the 2023 report on waste management do not look as good, since only 6.14% were recycled, 0.3% incinerated and almost 90% are landfills. Of the total waste produced during the reporting period, only 0.3% is hazardous waste. As regards the social factor, Electrica has implemented ISO 45001: 2018. Currently, the company follows a human resources strategy that aims to provide qualified personnel. According to the report, there has been a 4% increase in the number of employees since 2018, and currently, 98% of the 8300 employees are trade union members. On December 31, 2022, 7,907 employees were reported, fewer by 1.66% than in 2021. As this sector is generally dominated by men, 28% of Electrica employees are women, however, they hold 35% of the management positions. In 2022, the company offered its employees benefits of over RON 600 million, as well as about 77,000 hours of training (on technical and communication skills and safety and security at work). The "Zero accidents" target of the company saw a reduction by more than 30% in the number of work-related accidents since 2018. Moreover, to combat discrimination in the workplace, the company has implemented an anonymous reporting system. For the progress of the community, Electrica provided financial support (almost doubling its budget to EUR 540,000 in 2019 compared to 2018) in various fields, reaching 25,000 direct beneficiaries.

In terms of the governance factor, the company fully complies with the BVB Corporate Governance Code. To structure its non-financial report, Electrica worked with several stakeholders. Its objectives include obtaining the certification for the anti-corruption management system ISO 37001 and, for this purpose, the company updated its policies on conflicts of interest, money laundering, and corruption.

Nuclearelectrica reported its non-financial activity in the annex to its annual report for the period under review. Among the drawbacks of how it disclosed information is focusing on how it met legal requirements, in addition to the fact that the information is not sufficiently structured and repeated.

Regarding the environmental factor, Nuclearelectrica implemented ISO 14001: 2015 and monitors several indicators such as radioactive waste (78.5% of legally

authorized emissions), workplace radioactivity levels, or radioactive contamination of land surface (Nuclearelectrica, 2019). However, it does not provide any other clear information on other indicators. In terms of the social factor, it is noted that the company implemented ISO 45001 and that it has in place radiation protection programs for employees, aiming to record the levels of controlled radioactivity. The company has a low turnover rate (3.8% in 2019) and provides training for its employees, especially in the field of nuclear safety and risk management. At the same time, Nuclearelectrica developed for its employees a set of principles on equality, health security, and freedom of expression. The company became a UNICEF partner in 2019 and supported humanitarian as well as educational, health, environmental, and cultural projects.

Despite having defined a CSR strategy, the company did not set clear, or SMART, goals. However, as regards the governance factor, Nuclearelectrica implemented the anti-corruption management system ISO 37001: 2016, as well as the BVB Governance Code. Thanks to its integrated management system, the company managed to reduce hazard events to zero.

Surprisingly, **Erste Group Bank** did not report on its non-financial activities in Romania. The last report on corporate social responsibility (which followed the GRI guidelines) was published in 2010. However, we have collected some information from its corporate governance framework and Code of Ethics (Erste Group, 2023). For the environmental factor, no information was disclosed in the documents examined. Regarding the social factor, we have noted a “zero tolerance” policy regarding discrimination and harassment, while diversity is encouraged. Corporate volunteering is encouraged within the company, as well as the employee's proposals for social projects. For the community, the company shows its support by establishing educational and cultural partnerships. At the governance level, it states its “zero tolerance” for corruption and acts against conflicts of interest.

The next company in the analysed ranking is **Transgaz**, which disclosed its non-financial information in a chapter of the Directors' Report (Transgaz, 2023). However, it has shown an interest in sustainability by setting goals in this respect. For the environmental factor, Transgaz implemented ISO 14001: 2015, as well as a supply chain program to procure environmentally friendly materials. The company constantly surveys its compliance with the law,

especially with industry-specific laws, monitoring relevant indicators. It also reports measurements of polluting sources and manages waste (both hazardous and non-hazardous).

For 2019, Transgaz managed to achieve higher levels of energy efficiency compared to the previous year, while reducing its technological consumption, and, on 8 December 2022, it signed the agreement to participate in the Work Program of the European Hydrogen Backbone (EHB) for 2023, thereby continuing the activities launched as part of this initiative. For the social factor, Transgaz operates in accordance with ISO 45001 and reports that, in 2019, it hired more persons than those who left the company. At the same time, 95% of its employees are members of trade unions. The company provided 139 training courses for its personnel, with 1619 participants in 2019, for which the report provides detailed data. The social factor remained equally important for the company in 2022, therefore the organizational structure of SNTGN Transgaz SA includes the Employee Representation Office, which represents the interests of employees in the relationship with the employer, aiming to comply with the legal provisions in the field of labour relations and social protection. In addition, the employees benefited from training and development opportunities: in 2022, 201 vocational training courses were conducted, attended by 2915 employees, and the TransGasDigital project, co-financed from European funds, was completed with the aim to improve the level of knowledge and digital skills of the employees of the company.

Transgaz was also engaged in financing community projects in areas such as health, education, social, and sport (allocating over RON 4 million). In terms of governance, the company operates in accordance with the BVB Corporate Governance Code and its integrity plan for 2016-2020. It, therefore, condemns corruption, manages conflicts of interest, discloses its contracts, and considers the fight against fraud to be a priority. The company also monitors the news published about the company's activity and examines them to check whether they are neutral, positive, or negative.

Last but not least, **Transelectrica** has only issued two sustainability reports since it is listed on BVB, for 2017 and 2018. The company followed the GRI standards (Transelectrica, 2019). Moreover, the company was granted a recognition award from Romania CSR Index for its activity in 2019.

For the environmental factor, the company operates according to ISO 14001: 2015. The company works to identify the environmental aspects and the risks associated with its activity but does not report on them. However, we can see from the report that the company managed its waste 84% more efficiently compared to 2018. Currently, the company is working on various projects to prevent and limit its environmental impact and achieve energy efficiency. However, some indicators have only legal limits as reference limits (e.g. noise pollution or electromagnetic field).

Regarding the social factor, Transelectrica has implemented a policy that promotes equality and women in leadership roles and fights against discrimination (income differences between men and women are decreasing; there are 35.8% more women in senior positions than in 2018; there were no discrimination incidents in 2019). In the reporting year, more persons left the company than those who joined it. Most employees are members of trade unions. Transelectrica has provided

professional training for over 1000 employees in various fields, as well as safety and security training. For 2019, no work-related accidents or occupational diseases were reported. The company encourages employees to practice corporate volunteering and is involved in community projects (for which it has set several goals that are not SMART).

Regarding the governance factor, Transelectrica collaborates with stakeholders in addressing non-financial issues. The company complies with the BVB Corporate Governance Code. At the same time, the company developed in 2019 an integrity plan which mentioned the anti-corruption strategies as well as the behaviour guidelines according to its code of ethics and conduct.

We have compiled below, according to **Table no. 3**, the standards and the non-financial reporting tools considered in the analysis carried out. Their variety once again highlights the need for tools that can be used consistently and easily by the business environment.

Table no. 3. Non-financial reporting standards/tools considered in the analysis carried out

Item no.	Non-financial reporting standard/tool
1.	Global Reporting Initiative (GRI)
2.	Sustainable Development Goals (SDGs)
3.	SDG Compass
4.	ISO (International Standardization Organization) Standards
5.	Sustainability Accounting Standards Board (SASB)
6.	AA1000 (Stakeholder Engagement Standard)
7.	Carbon Disclosure Project (CDP)
8.	BVB Corporate Governance Code
9.	European Green Deal
10.	ABC (Anti-Bribery and Corruption) Governance

Source: Own processing

After examining the non-financial reports of the analysed companies, we compiled a list of the ESG aspects that

were most frequently encountered, as can be seen in **Table no. 4**.

Table no. 4. Common ESG aspects from the non-financial reports of the top ten companies listed on BVB

Environment	% companies	Social	% companies	Governance	% companies
ISO 14001	60%	CSR funding	70%	Anti-corruption policy	70%
Waste	60%	Diversity	60%	BVB Corporate Governance Code	60%
Emissions	60%	Development programs	50%	Communication with stakeholders	30%
Energy	40%	ISO 45001	40%	Partners who adhere to their principles	20%
Water	20%	Corporate volunteering	30%		

Source: Own processing

Most of the ESG aspects addressed by the analysed companies included the ISO 14001 environmental management system, waste, and emissions (which were considered in the analysis only if the reporting provided measurement information for those indicators) for the environmental factor. Regarding the social factor, CSR funding and employee diversity were most often mentioned, while for the governance factor, it was found that anti-corruption was mainly addressed, followed by compliance with the BVB Governance Code.

Conclusions

Although non-financial reporting is still voluntary, it can be considered a common practice among large companies. As seen in the case of the top ten companies listed on BVB (according to the classification in **Table no. 1** – Top ten companies listed on BVB according to the value between October 2019 and October 2020) 40% of them follow the GRI guidance in their reporting. At the same time, 10% mention the SDGs and 10% consider the SASB standards. While SDGs have only recently started to appear in non-financial reporting due to their novelty, we can anticipate that they will gain considerable ground in the future. Following the review, it can be concluded that OMV Petrom had the most comprehensive non-financial report, making commitments to sustainability and setting clear objectives. Moreover, the company complies with the SDGs and the GRI standards, covering a wide range of variables and monitoring their dynamics. From the banking sector, BRD appears to have the clearest report, in particular because it has reported on the progress achieved on the targets set, despite the inclusion of its non-financial statement in the annex section. Regarding Banca Transilvania, although its sustainability report covered all three aspects of ESG and followed the GRI guidelines, it was largely descriptive, without providing a clear picture of how it monitors the relevant indicators. In the energy sector, Electrica and Romgaz have issued reports covering a variety of materiality issues, monitoring performance, and referring to well-known tools such as GRI

(both companies), EU standards (Electrica), and SASB (Romgaz). As for Erste Group Bank and Fondul Proprietatea, investors are most likely eager to have the opportunity to reflect on their non-financial activity. Therefore, although these companies have made progress in reporting on their non-financial activities, there is still a long way to go. There is no doubt that stakeholders are calling for more transparency and, nowadays, one of the challenges facing companies is to determine how and what to measure to contribute to sustainability. However, in this regard, scientific research also needs to progress to provide companies with the right tools, which can further contribute to the development of an appropriate legislative framework on how non-financial reporting (in general) and the ESG aspects (in particular) are to be operationalized.

Limits and future research directions

Any research study has certain limits that can influence the results obtained, and this paper is no exception. However, we believe that these limits can be translated into future research directions. In connection with theoretical research, the limits are determined by the breadth of the literature on the subject being treated and the multitude of empirical research conducted by researchers from all over the world.

This paper provides an overview of corporate reporting criteria and methodology. As we have shown, one of the existing shortcomings in sustainability reporting and the quality of these reports consists of the lack of standardization that makes comparability difficult.

We believe that these companies that resort to the publication of the sustainability report can more easily attract capital from investors and earn their confidence by ranking more easily in the trading tops. On the other hand, companies that do not publish this sustainability report transparently may be suspected to intend to conceal their real practices. These ideas are the subject of future research directions.

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The External Technological Context of Artificial Intelligence in Financial Services

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Abstract

The purpose of this research is to improve the understanding of the external technological context of Artificial Intelligence applied in financial services, together with other technological solutions such as digitization, automation, cloud computing and licensing. The authors studied the external technological context by analyzing the technology providers that are represented by the companies with CAEN code 620 – Service activities in information technology. The purpose of this study was to obtain and analyze answers to six research questions, as follows: what is the role of service providers, what are the other technologies offered by them together with Artificial Intelligence, how can this technology be effectively implemented, what is the involvement users in application development, if there will be specific training and what is the level of implementation of Artificial Intelligence in financial services. The authors found that often the investigated companies use their technology services only for banks, Fintech and large financial companies. Therefore, for small and medium-sized companies, the service providers included in the study are not suitable, and further research should be carried out in this regard. An interesting result emerged from the study of long-term relationships between the technology company and the financial company to improve the solutions and provide the necessary maintenance services until the solutions provide results with close to 100% accuracy.

Key words: technological context; financial sector; AI solutions; digitalization; automation;

JEL Classification: M40, M41, M42, M15

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Introduction

Artificial Intelligence is a technology used with other technological solutions such as digitalization, cloud computing, automation.

Data availability in digital format helps the business to use other technological solutions which have the ability of reducing repetitive tasks. So, the digitalization is the first step a company needs to make before automation or AI solutions implementation (Hamdan et al., 2016).

Digital financial services rely on digital technologies when delivering their services to customers. Fintech refers to digital technologies that are intended to change the way a financial company operates. This term is used to describe digitized financial services: cloud services, web, mobile, digital ID, machine learning, APIs (World Bank Group, 2020).

Cloud computing in format of IaaS (Infrastructure as a service) which refers to the data backup or SaaS (Software as a service) which refers to also applications backup on service providers infrastructure, helps the financial services for which there are high volumes of data to store them on a safety place (Chaimaa et al., 2020).

Automation of repetitive tasks will help the financial specialists to focus more on consultancy and data analysis which will help them improve their work with their clients and to increase profit (ICAEW IT Faculty, 2018).

There are several questions a company must answer when it wants to implement a new technology. In this sense, several studies have been carried out in the field, but none of them has done extensive research on technology providers and their services. Also, most of them are not from recent years, which would lead to the need for new research (Hamdan et al. 2016).

The topics which were of interest for the majority of researchers were: managers involvement if the IT implementation process, involvement of the end users in the development and installation process, the existence of a robust training, the use of a strict planning methodology for applications development, the rate of IT specialist in organizations, the role of vendors and consultants (Hamdan et al., 2016). We have chosen some of these topics and together with topics from other researchers we have developed six research questions for our study.

At the base of this article stands the *The Technology-Organization-Environment Framework (T-O-E)* (Tornatzky et.al., 1990).

Technological context is represented by the existing technology in the company and the existing technology available on the market. The first one is the internal technology readiness and the second one is external technology readiness.

Internal technological readiness is represented by technologies which a firm is currently using (Collins et. al., 1988).

The external technological readiness is represented by the available technologies on the market, that a company can access (Tornatzky et.al., 1990).

This study contains four parts: the first part is a literature review studying the level of AI solutions in accounting and auditing and a SWOT analysis for AI; the second part addresses the description of the research methodology; the third part refers to the results, and the fourth part presents the conclusions of the study.

In this study we wanted to assess the ways in technological companies are offering their services to the financial companies. On this field there are already important studies but the focus is not only on financial sector but on other sectors such as: manufacturing, agriculture, retail (Hamdan et.al., 2016).

In this study we wanted to assess how technology companies impact the services offered to financial companies. In this field there are already important studies, but the focus is not only on the financial sector, but also on other sectors such as: production, agriculture, retail (Hamdan et al., 2016).

Literature review

Artificial intelligence in accounting and audit

According to Gartner (2019) AI in the present is among the fastest growing fields. In accounting and audit services company representatives declare that they found benefits such as faster data analysis, time savings, increased level of accuracy, enhanced client service and more in-depth data into the business processes. AI promises, to the adopting companies, competitive advantages by using mimic cognitive skills together with human judgement (Munoko et. al., 2020).

In case of repetitive activities, even if they are not the most important part of the business, they are important for taking more informed decisions. Audit and assurance relay on updated and comprehensive accounting information (Zemánková, 2019).

Artificial intelligence in audit:

- Analytical review procedures performed for obtaining audit evidence,
- Classification,
- Materiality assessment
- Decisions regarding going concern principle
- Bankruptcy prediction
- Audit process performed for the entire data existing in the company not only for a sample (Baldwin et.al., 2006).

- Business consulting services for clients
- Focus on relevant information for investors
- Reducing the risks generated by digital data security threats
- Development of accounting standards (CECCAR, 2019)

Artificial Intelligence solutions and SWOT Analysis

In order to have a clearer image of the impact of AI in business we have made a SWOT analysis (**Table no. 1**), based on literature review (Hamdan et. al., 2016; ICAEW IT Faculty, 2018; Chaimaa et.al., 2021; Li et al., 2018).

Artificial intelligence in accounting:

- Real time decision making

Table no. 1. SWOT Analysis for AI implementation

Strengths	Weaknesses
Increase turnover and number of clients Increased productivity Improve internal efficiency Improve quality Reduce administrative and operating costs Improve the company's image Reduced time spent on repetitive tasks Opportunities for growth Less errors and more reports for clients Increased consistency in decision making Process huge amount of data Improve business decision making Reduce transaction time	Lack of awareness on the potential of AI Perception of a small value for their business Lack of expertise, knowledge, and technical skills Lack of prepared human resources Lack of financial resources Lack of management planning and budget allocation Managers do not have a good perception of cost/ benefit of AI usage
Opportunities	Threats
An acceptable cost Enough resources on the market Technical support Available trainings Implementation and maintenance from the service providers More time for personalized reports for clients and also business consultancy Hire or contract a dedicated training staff The ability of leading client's growth	Cyber security threats Competitors which are already using AI have the capacity of attracting and serving more clients More valuable services for clients, from the companies which are using AI Hire costs for clients for the new services

Source: Authors' representation, based on Hamdan et. al.(2016), ICAEW IT Faculty, 2018

Research questions:

The questions we asked, also inspired by specialized literature, are presented in

Table no. 2, together with the corresponding concepts.

Table no. 2. Research questions

Research question	Authors	Concepts
RQ1. Which is the role of service providers in financial sector?	Hamdan et.al., 2016	Role
RQ2. Which are the other technologies the service providers are offering for financial sector, together with AI?	Clauberg, 2020	Technologies
RQ3. How can technology be implemented effectively in financial sector?	Berger et.al., 2013	Implementation
RQ4. Which is the involvement of users in the development and installation of AI solutions for financial sector?	Hamdan et.al., 2016	Collaboration
RQ5. Will there be a training?	Hamdan et.al., 2016	Training
RQ6. What is the level of AI implementation in financial services and the long-term vision?	ICAEW IT Faculty, 2018	AI future

Source: Authors' representation, based on literature review

RQ1. Which is the role of service providers in financial sector?

The use of technology is increasing productivity, improve management performance, increase competitive advantage, save operating costs and add value to the provided services. The role of technology was studied in various domains such as: education, healthcare, manufacturing, supply chain, accounting, audit. (Hamdan et.al., 2016) But there is still a need of studying the role of service providers in the technology implementation level in this field. For this paper we are focusing on the role of service providers in the financial sector of activity.

RQ2. Which are the other technologies the service providers are offering for financial sector, together with AI?

AI solutions are used together with other technologies in order to offer the expected results. For a company to start implementing AI solutions that company needs to use digitalization and automation solutions and also cloud computing to save the high volume of data (Clauberg, 2020).

RQ3. How can technology be implemented effectively in financial sector?

For a technology to be effectively implemented the human factor is very important. The agents which are working directly with customers' needs to be prepared to work with technology. Also, the employees which are working with the technological solutions need to be prepared. Governmental regulations are also determining the level of technological implementation. Market conditions represent

another element of the way in which technology is implemented into a company. An undeveloped market will definitely influence the level of technology implementation in a negative way (Berger et.al., 2013).

RQ4. Which is the involvement of users in the development and installation of AI solutions for financial sector?

Employees need to be part of the technology development and implementation process, regardless of industry, because they know exactly what they need and they are the ones who will work with these technologies (Hamdan et al., 2016). For this study we focused only on the financial sector and wanted to see how financial specialists are involved in the development and implementation process.

RQ5. Will there be a training?

After the development of a new solution the technological service providers need to offer training for the employees which are working with that technology (Hamdan et.al., 2016). For this study we wanted to see if the technological companies are presenting these services on their websites as being an important step into a successful technology implementation process.

RQ6. What is the level of AI implementation in financial services and the long-term vision?

On a global online survey carried out by McKinsey in 2020 with 2395 companies from all the industries, almost half of them said that they implemented AI for at least one function.

The long-term vision for the employees working in financial services is to develop a new set of skills: think radically, to be adaptable, exploit powerful technologies, and focus on the purpose (ICAEW IT Faculty, 2018).

Methodology

At a 95% confidence level and 5% margin of error for a population of 19364 Romanian technological companies according to TopFirme.ro, a representative sample is based on 377 companies with CAEN Code 620: CAEN 6201 – Custom software creation activities (customer-oriented software); CAEN 6202 – Consulting activities in information technology; CAEN 6203 – Management activities (management and exploitation) of computing resources; CAEN 6209 – Other service activities regarding information technology (Hajian, 2011).

We have selected these companies from “TopFirme.ro” for Romania, having the following characteristics: over 10 million Ron turnover in 2021, with a website and offering services to financial sector. We have designed a list with: company name, CAEN Code, turnover from “Company list” and we completed from their websites with the other information.

In total we have selected 78 companies out of which we have 65 with globally headquarters, 12 only European headquarters and 76 are also present in Romania. Those 78 companies are in top 100 technological companies in 2021 according to the data from National Trade Registry Office from the Ministry of Public Finance, a ranking made based on annual turnover. These companies have on their portfolio solutions based on AI and they are offering their services to financial sector.

Cited 270 times, a study from Hall, Beecham and Rainer (2002), conducted on 12 IT companies and focusing on: organizational issues, project and product issues and development issues is in line with our research interest. More other studies are conducting literature review on the ways of error correction on technology implementation, or software improvements and maintenance (Ivarsson et.al, 2011; Walia et.al., 2009; Willson et. al., 2005).

No researchers did such an in-depth analysis of technological companies with the scope of understanding the available technological solutions only for financial sector of activity.

The selected sample is considered representative because it takes into consideration the first 200

technology development companies looking at the turnover. These companies need to have a well-developed web site and a blog together with case studies and testimonials from their clients from financial sector. We wanted to focus on the best technology providers for the financial sector because they offer the best services.

After we have analyzed the data from their websites, out of this list we have deleted the companies which does not have services for the financial sector. In the end we had 78 companies included in our study.

In order to study the data, a qualitative content analysis has been made. We reduced the data to concepts which describes the research phenomenon (Elo et. al., 2008). We choose to make a deductive analysis by collecting the data for content analysis, then making sense of the data and the last step selecting the unit for analysis (Neuendorf, 2011; Rourke & Anderson, 2004).

A qualitative approach of the data analysis is more appropriate for this study because in the financial sector there was no research on the external technological readiness and this is a first step. Here we wanted to understand which are the technological factors which are influencing the financial sector to implement new technologies. After this step a quantitative research based on survey will be conducted to study the way of external technology implementation.

We wanted to determine how many companies have in their list of available services the following terms for external technological context: “AI solutions”, “digitalization”, “automation”, “cloud computing”, “application development”, “cyber security”, “licenses”, “process auditing”, “development, installation and maintenance” and for blog, case studies, podcasts we have included them in the “knowledge sharing” category.

After we completed the list for all the companies with the respective key words we made a total and based on the computed scores we categorized the companies into advanced, medium and beginners.

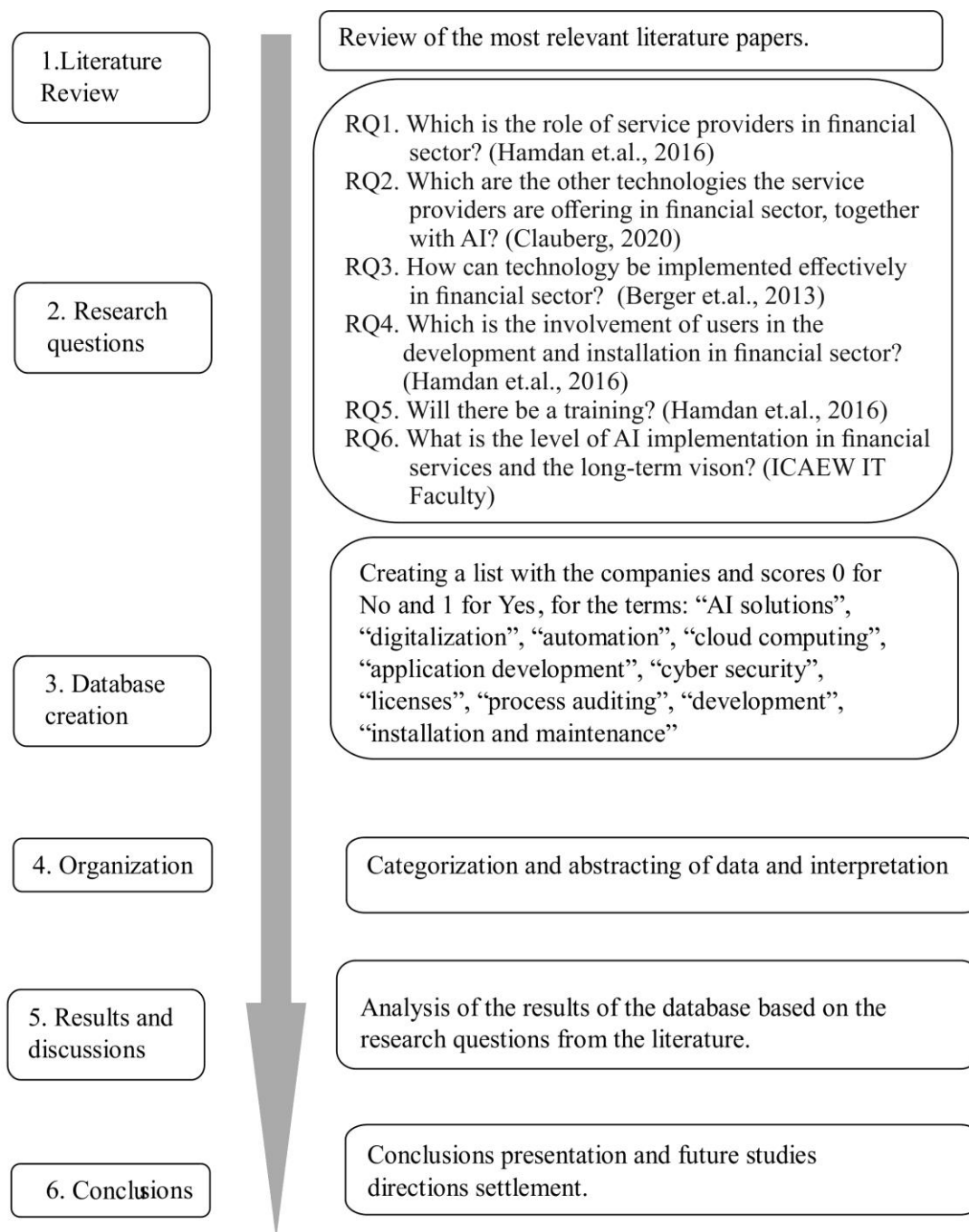
We also wanted to see if worldwide, on Europe and in Romania the companies are offering their services in the same percentage or there are some differences. And we can see that on worldwide level the companies have bigger percentages meaning that they are offering their services on a larger scale worldwide.

Then we answered to our research questions based on the information we found on the company’s websites: if they are offering a training, if they are working closely with

their clients to develop their services, which is the level of AI solutions implementation in financial services.

The specific steps which were followed in this study are presented in **Figure no. 1**.

Figure no.1. Description of the specific steps of the study



Source: Adapted after Kallio et.al., (2016), Massaro et.al. (2016), Stoica et.al. (2022).

Results and discussions

Taking into consideration the research questions adapted from literature and analyzing our Excel manually made database having all the terms on the list, we managed to provide the following answer to the research questions:

RQ1. Which is the role of service providers in financial sector? – Role

The role of service providers is to develop all the necessary technology solutions that a company needs. As we noted in this analysis, even though the technology companies published the service packages on their website with all the necessary details, none of them communicated the prices. Companies have posted a form on their website for companies to fill in with their requirements and after that a process audit will be done by specialists. From here we arrived to the conclusion that there are no standard services for all cases, but companies offer customization of services for each client's needs.

RQ2. Which are the other technologies the service providers are offering for financial sector, together with AI?

AI is an emergent technology which started to replace human tasks, which implies repetitive operations, but AI solutions can also perform complex activities. Before the implementation of AI solutions into a company, there is the need for an already present digital solutions, automatization processes and also cloud computing backup, in order to sustain the high volume of data processed by AI solutions. Beside these services technological providers are also offering: licenses and application development for personalized solutions; audit process at the beginning of collaboration; installation services; maintenance which is needed for possible issues with the programs and also knowledge sharing which is done via blogs, podcasts, case studies, testimonials.

In **Table no. 3** there are mentioned how many companies have made available the listed solutions representing external technological context, on their websites.

Table no. 3. External technological context

Solutions	Acronyms	Worldwide	European	Romanian
Artificial Intelligence for Financial Sector	AIFS	94%	90%	90%
Digitalization services for financial sector	DSF	100%	100%	100%
Automation services for Financial Sector	ASFS	98%	98%	98%
Artificial Intelligence	AI	94%	90%	90%
Cloud computing for Financial Sector	CCFS	81%	79%	80%
Application development for Financial Services	APFS	97%	96%	93%
Cyber security	CS	90%	92%	90%
Licenses for Financial Sector	LFS	96%	96%	96%
Process auditing	PA	100%	100%	100%
Installation and maintenance, trainings	IMT	100%	100%	100%
Knowledge sharing	KS	100%	100%	100%

Source: Authors' representation

We can see that all the companies are offering digitalization services together with: process auditing, installation and maintenance and knowledge sharing via blogs, case studies. Digitalization is closely followed by automation services, licenses and AI services in 94% out of the worldwide companies and 90% for the ones present also in Europe and Romania.

RQ3. How can technology be implemented effectively in financial sector? – Implementation

In order for a technology to be implemented effectively, the IT teams need to work closely with the financial teams, even if they are in the same company or not. The providers of technology do not offer standard products and services for every potential client but

they personalize the services, in order to best serve every client's needs.

In **Appendix A** we have centralized the companies and their scores, 1 is for "Yes", meaning that the company has that technology or service and 0 is for "No", meaning that the company does not have that technology or service. Based on the scores we have splatted the companies into three categories: advanced, medium and beginners. In the

end we added the scores and the ones which have 11 and 10 we considered to be advanced in available technological solutions, 11 being the highest score. The ones with 9 and 8 we considered to be medium and the ones with 7 and 6 we considered to be beginners. As we can see in **Table no. 4**, which was made using the data from **Appendix A**, in 84% of the cases the companies are advanced in available technological solutions.

Table no. 4. The state of technological readiness

Technological state	Scores	Percentage of companies
Advanced	11 – 10	84%
Medium	9 – 8	15%
Beginners	7 – 6	1%

Source: Own representation

RQ4. Which is the involvement of users in the development and installation? – Collaboration

The user's involvement in development and installation is a very important one. Financial specialists need to work closely with the IT team in order to design the perfect solution for their needs. (ICAEW, 2018) On majority of analyzed companies which have case studies and blogs, we found highlighted the role of a closely relationship in between the companies and their clients. Even if these companies have standard services or cloud computing, we were interested on the personalized services and products which needs time to be completely delivered. And in these cases, from the process audit moment which is the first step, to programming, training, testing and implementation and maintenance it takes 1-2 years on which the IT team and financial teams needs to work closely.

RQ5. Will there be a training? – Training

After the technological provided has finished the development and testing part of the AI solutions the potential client decides to buy and use it and there will be a training from the technological providers for all the client's employees which will work with the solution. In all the cases training is available to all employees which will use this solution in the moment the company decides to implement the new solutions.

RQ6. What is the level of AI implementation in financial services and the long-term vision? – AI future

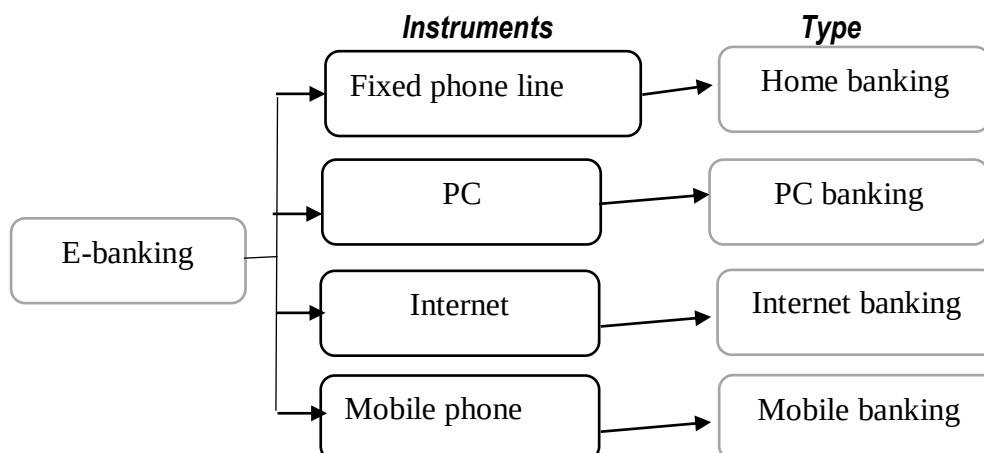
Based on our research, in 87% of the cases technological companies are offering AI solutions for financial services and they have case studies with success examples from banking and Fintech.

Some of the advantages of AI usage in financial services are:

- Faster fraud detection
- Customer experience personalization
- Data-driven decision making
- Data management
- Automated customer service.

Banking – Electronic banking (e-banking) appeared due to globalization, rapid growth of IT systems and competition (Chaimaa et.al., 2021) It is a self-service and help banks to deliver services to its customers via Internet and mobile phone. It was adopted by many banks to increase existing customer satisfaction or to gather new clients. As compared to traditional way, e-banking reduce costs. Using it banks and clients can exchange information, conduct banking business, and buy or sell goods. But the major disadvantage remains cyber-attacks (Bahl et. al., 2012) There are four types of e-banking as it is shown in the **Figure no. 2**.

Figure no. 2. E-banking type



Source: Chaimaa et.al., 2020

Financial Technology (Fintech) is defined as a cross-disciplinary subject, which combines Technology Management, Finance and Innovation Management. Its applications can be categorized into: advisory services, payments, financing and compliance (Leong et.al., 2018).

Success stories

From the analysis of the articles, testimonials and case studies highlighted by the companies' websites we have designed a list with the applications of digitalization, automatization and AI-based solutions, offered by these companies to financial sector (Table no. 5).

Table no. 5. AI based applications

Application	Services	Industry
Paper-free banking loan application	Software development	Banking
Accounting info & payments platform using open banking APIs	Software Development	Fintech
Strategy & Security modules for financial app, Facilitating loan management	Software Architecture Software Development Software Testing	Fintech
AML Compliance reporting platform	Software Development	Big data
Cash management analytics tool, Making e-banking easy	Project Management Software Development Software Testing	E-banking
Data crunch application, powering an AI- Driven FinTech solution	Business Analysis Software Development Software Testing	Fintech

Source: Authors representation based on Fortech company

Other companies offer personalized Banking software development services such as: banking digital transformation, digital retail landing application, customized legacy core banking systems, digital onboarding, anti-money laundering and know-how customer, data engineering and predictive analytics.

Conclusion

Starting from six research questions based on the specific literature, we have provided answers based on the analysis of 78 technological companies in order to see exactly which are the available services on the market. In order to simplify, we allocated to each question a general

concept. The novelty of our research is provided by the terms we included in the study, looking at the technological part with AI and cloud computing for example, but also at the relation creation with clients realized with Knowledge sharing and constant support. There is no distance between suppliers and clients and their close collaboration is the key to success.

For the role of service providers, collaboration between developers and financial specialists and training, there is another research but it is not focused on technological companies which are offering services for financial sector (Hamdan et.al., 2016).

In this study we can see that service providers have all the necessary solutions and labor force and knowhow to serve properly the needs of financial services. We can see these from their success stories on their blogs, testimonials, case studies. Their role is to offer personalized solutions, to work closely with financial teams to understand their needs, to install the programs and to offer maintenance as long as their clients' needs it. They are not offering only AI solutions, but they started with licenses and digitalization, automatization, cloud computing.

In order to be effectively implemented a technology needs to be tested on a relevant amount of data and every time the input data will appear in a new template to improve the program. There is needed a continuous learning and a close relationship between financial and IT teams. Also, the financial teams need to make an audit of the generated data on a continuous way.

The users of AI solutions are closely working with the technology providers for testing, implementation and maintenance of the solution. Before the installation of a specific solution the financial company or team will receive a proper training from the service provider company.

AI solutions implementation will determine the financial

specialists to focus more on purpose, to think radically and to be adaptable. AI solutions are able to work with large volume of data with complex and changing patterns (ICAEW, 2018). In our study we can see that for now the service providers have posted success stories of Banks and other big financial institutions.

Companies using AI which registered a 20% increase of turnover noticed a change of the business in the following directions: better overall performance, better overall leadership and resource commitment to AI. High performers prefer to develop in house AI solutions and for this they need: data engineering, translators, data architects. They have the ability of producing and end-to end AI based solution. The companies with the highest turnover generated by AI solutions tend to invest more on: business strategy, ways of working, talent and leadership, data, models, tools and technology and adoption (McKinsey, 2020).

This article represents a complex study of the most relevant questions from the literature which are important also in practice for the financial companies willing to implement AI solutions. Big companies' representatives can find here a list of the top 78 companies which are offering AI solutions and services for the financial sector.

Study limitations

One important limitation may refer to the sample dimension. This study took into consideration only the top IT companies, working with banks and big financial companies and for this reason this study is not useful for small and medium financial companies. For these, further studies will be conducted.

The scale is not sensitive enough to observe differences between the companies in the first half. This represent a limitation of this paper and will be discussed and addressed in future versions of the paper.

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Appendix A. List of companies and their scores: 1 for Yes, 0 for No

No.	Company	AIFS	DSFS	ASFS	AI	CCFS	ADFS	CS	LFS	PA	IMT	KS	Total
3	IBM ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
4	ENDAVA ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
5	ORACLE ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
6	COGNIZANT TECHNOLOGY SOLUTIONS ROMANIA S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
7	NTT DATA ROMANIA S.A.	1	1	1	1	1	1	1	1	1	1	1	11
8	S & T ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
10	STEFANINI ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
11	FORTECH SRL	1	1	1	1	1	1	1	1	1	1	1	11
12	PENTALOG ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
14	INTRAROM SA	1	1	1	1	1	1	1	1	1	1	1	11
16	CEGEKA ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
18	AROBS TRANSILVANIA SOFTWARE S.A.	1	1	1	1	1	1	1	1	1	1	1	11
20	TREMEND SOFTWARE CONSULTING SRL	1	1	1	1	1	1	1	1	1	1	1	11
24	NESS ROMÂNIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
25	INETUM ROMANIA S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
26	MHP CONSULTING ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
27	K-BUSINESSCOM S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
28	WIPRO TECHNOLOGY SOLUTIONS S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
29	ACCESA IT SYSTEMS SRL	1	1	1	1	1	1	1	1	1	1	1	11
30	TOTAL SOFT S.A.	1	1	1	1	1	1	1	1	1	1	1	11
31	RINF OUTSOURCING SOLUTIONS SRL	1	1	1	1	1	1	1	1	1	1	1	11
32	OSF GLOBAL SERVICES SRL	1	1	1	1	1	1	1	1	1	1	1	11
33	FINASTRA ROMANIA S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
34	HCL TECHNOLOGIES ROMANIA SRL	1	1	1	1	1	1	1	1	1	1	1	11
35	ZITEC COM SRL	1	1	1	1	1	1	1	1	1	1	1	11
37	R SYSTEMS COMPUTARIS EUROPE S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
38	SOFTWARE IMAGINATION & VISION S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
39	SII IT & C SERVICES SRL	1	1	1	1	1	1	1	1	1	1	1	11
40	CRAYON SOFTWARE EXPERTS ROMANIA S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
44	B.B.H.M.M. S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
45	ACCESA IT CONSULTING SRL	1	1	1	1	1	1	1	1	1	1	1	11
46	ORION INNOVATION S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
48	THOUGHTWORKS ROMANIA S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
49	THALES DIS ROMANIA S.R.L.	1	1	1	1	1	1	1	1	1	1	1	11
50	PTC EASTERN EUROPE SRL	1	1	1	1	1	1	1	1	1	1	1	11
51	NTT DATA Romania SA	1	1	1	1	1	1	1	1	1	1	1	11
52	ING IT HUB	1	1	1	1	1	1	1	1	1	1	1	11
54	SS&C Blue Prism	1	1	1	1	1	1	1	1	1	1	1	11
55	Work fusion	1	1	1	1	1	1	1	1	1	1	1	11
56	Cyclone robotics	1	1	1	1	1	1	1	1	1	1	1	11
57	Samsung SDS	1	1	1	1	1	1	1	1	1	1	1	11
59	IBM	1	1	1	1	1	1	1	1	1	1	1	11
60	Liye	1	1	1	1	1	1	1	1	1	1	1	11

No.	Company	AIFS	DSFS	ASFS	AI	CCFS	ADFS	CS	LFS	PA	IMT	KS	Total
61	Pegasystems	1	1	1	1	1	1	1	1	1	1	1	11
63	DXC Technology	1	1	1	1	1	1	1	1	1	1	1	11
66	MSG Systems	1	1	1	1	1	1	1	1	1	1	1	11
67	Metro Digital Romania	1	1	1	1	1	1	1	1	1	1	1	11
68	ACCESSA IT SYSTEMS	1	1	1	1	1	1	1	1	1	1	1	11
70	Intel Software Development	1	1	1	1	1	1	1	1	1	1	1	11
77	Top it consult	1	1	1	1	1	1	1	1	1	1	1	11
2	Microsoft	1	1	1	1	1	0	1	1	1	1	1	10
9	DELOITTE TEHNOLOGIE SRL	1	1	1	1	1	1	0	1	1	1	1	10
17	ACCENTURE INDUSTRIAL SOFTWARE SOLUTIONS S.A.	1	1	1	1	1	1	1	0	1	1	1	10
22	ALTEN SI-TECHNO ROMANIA SRL	1	1	1	1	0	1	1	1	1	1	1	10
23	MICRO FOCUS SOFTWARE ROMANIA S.R.L.	1	1	1	1	0	1	1	1	1	1	1	10
41	SDL LANGUAGE WEAVER S.R.L.	1	1	1	1	0	1	1	1	1	1	1	10
42	NETROM SOFTWARE SRL	1	1	1	1	0	1	1	1	1	1	1	10
43	AXWAY ROMANIA SRL	1	1	1	1	0	1	1	1	1	1	1	10
47	CERTSIGN SA	1	1	1	1	0	1	1	1	1	1	1	10
62	Appian	1	1	1	1	0	1	1	1	1	1	1	10
65	Infosys	1	1	1	1	1	1	0	1	1	1	1	10
71	TRENCADIS	1	1	1	1	0	1	1	1	1	1	1	10
72	Yonder SRL	1	1	1	1	0	1	1	1	1	1	1	10
78	Smart soft power	1	1	1	1	1	1	1	1	1	1	0	10
1	Google	1	1	1	1	1	0	1	0	1	1	1	9
21	3PILLAR GLOBAL SRL	1	1	1	1	0	1	0	1	1	1	1	9
36	DENDRIO SOLUTIONS S.R.L.	0	1	1	0	1	1	1	1	1	1	1	9
53	Automation Anywhere	1	1	1	1	0	1	0	1	1	1	1	9
58	NINTEX	0	1	1	0	1	1	1	1	1	1	1	9
64	KEYSIGHT	0	1	1	0	1	1	1	1	1	1	1	9
69	Printed Group	1	1	1	1	0	1	0	1	1	1	1	9
74	N-able technologies	0	1	1	0	1	1	1	1	1	1	1	9
13	VEEAM SOFTWARE SRL	0	1	1	0	1	1	1	0	1	1	1	8
19	NAGARRO IQUEST TECHNOLOGIES SRL	0	1	1	0	0	1	1	1	1	1	1	8
73	Net Brinell	0	1	1	0	1	0	1	1	1	1	1	8
75	Amtech consulting	0	1	1	1	0	1	0	1	1	1	0	7
76	total expert	0	1	1	0	0	1	0	1	1	1	1	7
15	RASIROM RA	0	1	0	0	0	0	1	1	1	1	1	6
Total		68	74	74	68	61	72	69	71	74	74	73	



Using XBRL for Sustainability Reporting under the European Green Deal

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ABSTRACT

The European Green Deal brings into attention a new strategy to support the transition to a society that will meet the challenges of climate change and environmental degradation, improving the quality of life. Given the multitude of actors involved in the process of collecting, processing and communicating information on the impact of different activities on the environment and citizens, it is necessary to have a legal framework on sustainability reporting as rigorously as possible, in order to ensure the comparability in time and space of the information provided. For this information, reported at the European Union (EU) level, to allow decision-making at the right time, it is necessary to use digital technologies to facilitate the process of collecting, analysing and interpreting information. In this paper the authors tried to offer a practical example on how eXtensible Business Reporting Language (XBRL) works in order to highlight the benefits of this modern language in the context of the Green Deal. In this regard, using Altova MissionKit 2023, the authors designed an XBRL taxonomy which is the basis for the development of an instance in which we find some representative indicators for the circular economy, an environmental objective of the EU taxonomy. The XBRL language simplifies the transfer of information from sustainability reports prepared in different countries to the European Commission, improving and accelerating the decision-making process.

Key words: European Green Deal; sustainability reporting; circular economy; EU taxonomy; digital technologies; XBRL;

JEL Classification: O13, O33, Q56

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1. Introduction

Since its inception, the European Union paid a special attention to the environment and the sustainable development. The European Green Deal is a growth strategy which target is to transform the EU into a "fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use" (European Commission, Brussels, 2019). The implementation of this strategy requires a special attention in identifying sectors and activities with an impact on sustainable growth, while respecting the environment and citizens, so that investment is oriented towards sustainable projects.

Our paper concentrates mainly on the circular economy, as part of the European Green Deal strategy, and try to show, by a practical example, including specific indicators, how to improve the sustainability reporting in the European Union by using a modern language.

In the Communication of the Commission regarding the monitoring framework for the circular economy (European Commission, Strasbourg, 16.01.2018) there are presented ten indicators grouped into four stages and aspects of the circular economy: production and consumption; waste management; secondary raw materials; competitiveness and innovation. This framework, made available online (<https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework>), is subject to a continuous updating process (European Commission, Brussels, 11.03.2020a).

Reviewing the literature on circularity indicators, Corral-Marfil, Arimany-Serrat, Hitchen and Viladecans-Riera capture in their study the classification of indicators into three categories (Corral-Marfil et al., 2021): environmental indicators (energy consumption, water consumption, contaminating emissions and the generation, management and reuse of waste); social indicators (on human capital, social capital and human rights, anticorruption and bribery) and corporate governance indicators (referring to directors, executive board, audit committee, meetings and remuneration of directors, along with gender diversity among directors, corruption and bribery).

Considering the amount of information about sustainable activities collected and analysed at European level, an important role in improving the process of communication can have the use of XBRL.

XBRL can be defined as "an open, platform-independent, international standard for the timely, accurate, efficient, and cost-effective electronic storage, manipulation, repurposing, and communication of financial and business reporting data" (Bergeron, 2003). This language is based on XML, but one major difference is that XBRL expresses meaning while XML articulates only syntax (Hoffman and Watson, 2010). It increases the transparency in reporting in the sense that "it is easier to see the complete detail of all the information provided by the company" without increasing the level of detail and in that "it makes it much easier to find the information the user is seeking" (Eccles and Krzus, 2010) and "has an essential role to play in making the information in an integrated report as accessible and useful to as many stakeholders as possible" (Eccles, cited by Monterio, 2010).

As Monterio asserted (Monterio, 2013), XBRL could bring many opportunities and benefits to integrated reporting because it: makes integrated reporting data easily consumable by software applications, Web browsers, and other tools; ensures data is computer readable; allows data to be reused over and over; virtually eliminates data errors by eliminating rekeying of information and manual calculations; preserves data structure and context; embeds more complex business rules within data; preserves data integrity; enables data to be comparable; and helps build trust in and credibility around data.

XBRL projects ongoing around the world are regarding both public and private organizations, this language adapting to various aspects of reporting (internal financial reporting of organizations; preparation of financial statements required by regulatory bodies in the field of accounting; business reporting to various tax authorities, banks, non-bank financial institutions, statistical institutes and other bodies; credit risk assessment; exchange of information between government departments or other institutions, such as central banks; storage, exchange and analysis of other information on the activities of different organizations etc.).

Now, we can see that XBRL is intensively used in collecting, processing and distributing non-financial information and brings benefits to the preparers and users of information in non-financial reports around the world. Among the recognized European entities that have been involved in the creation of taxonomies for sustainable activities we mention: Carbon Disclosure Project and Climate Disclosure Standards Board, European Banking Authority, European Insurance and Occupational

Pensions Authority, Global Reporting Initiatives, Spanish Accounting and Business Administration Association, Sustainability Accounting Standards Board.

The European Union “has long pursued a leading role in policies to tackle climate change” and the European Commission “is continuing to pursue climate action in a challenging international setting, amidst growing geopolitical tensions, the rise to power of climate change deniers in major emitters, a pandemic and the ensuing economic slowdown” (Siddi, 2020).

The Green Deal (European Commission, Brussels, 2019) concentrates on climate and environmental-related challenges and includes measures such as: increasing the EU’s Climate ambition for 2030 and 2050; supplying clean, affordable and secure energy; mobilising industry for a clean and circular economy; building and renovating in an energy and resource efficient way; accelerating the shift to sustainable and smart mobility; from “Farm to Fork”: a fair, healthy and environmentally friendly food system; preserving and restoring ecosystems and biodiversity; a zero pollution ambition for a toxic-free environment. The European Green Deal also includes elements such as (European Commission, Brussels, 2019): pursuing green finance and investment and ensuring a just transition; mobilising research and fostering innovation.

The European Lab Project Task Force (ELPTF), established by EFRAG in line with the European Commission’s request, published on March 2021 a report integrating proposals for a relevant and dynamic EU sustainability reporting standard-setting (European Financial Reporting Advisory Group, 2021). At the same time, the EFRAG Board president published a report in which proposes the creation within EFRAG of a non-financial reporting pillar alongside the existing financial reporting pillar, to be organized as a public-private partnership (Gauzès, 2021).

In April 2021, the European Commission published the proposal for a European directive on the reporting of sustainability information by companies, considering the recommendations of the PTF-NFRS, the recommendations of the EFRAG president on the changes in the EFRAG’s governance, the information obtained from contracting different consultants (European Commission, Brussels, 2021). This proposal, following the Commission’s commitment in the European Green Deal to revise the Non-Financial Reporting Directive (Directive 2014/95/EU, with subsequent amendments and

completions), aims to build on international sustainability reporting initiatives – such as the Global Reporting Initiative, Sustainability Accounting Standards Board, International Integrated Reporting Council, Climate Disclosure Standards Board and Carbon Disclosure Project – and contribute to them (European Commission, Brussels, 2021).

Particularly relevant it is considered by the Commission the proposal of the IFRS Foundation to create an International Sustainability Standards Board (ISSB) at the request of International Federation of Accountants (IFAC). In fact, IFAC believes that “thanks to its independence, good governance and procedural compliance record, the IFRS Foundation is uniquely placed to establish an independent ISSB”, which “to establish IFRS standards for sustainable development” (<https://www.ifac.org/content/ifac-responds-proposed-amendments-constitution-ifrs-foundation>). The existence of a single set of globally accepted standards would increase the comparability of information reported by entities and simplify the process of interpreting information and making decisions.

A critical role in implementing the Green deal in different sectors have the digital technologies, which allow for distance monitoring of air and water pollution, or for monitoring and optimizing how energy and natural resources are used. Thus, the Commission propose to explore measures to ensure that digital technologies can accelerate and maximize the impact of policies concerning the climate change and the protection of environment (European Commission, Brussels, 2019). European Commission considers that green and digital transformation should be made at the same time (European Commission, February, 2020) and will have impact on every part of the economy, society and industry (European Commission, Brussels, 10.03.2020).

As regards the reporting of sustainability information, the European Commission states that companies should mark-up this information, more precisely, present it in the single electronic reporting format eXtensible HyperText Markup Language (XHTML) (European Commission, Brussels, 2021). Such a requirement for digital mark-up has already been introduced in the European Union in the case of consolidated financial statements presented in accordance with IFRS (Commission Delegated Regulation (EU) 2019/815, with subsequent amendments and completions), the existence of common standards facilitating digitization.

Obviously, digital reporting should not stop at companies, being of particular importance to all entities carrying out activities covered by the Green Deal or collecting information on these activities. By well organizing the data and ensuring its availability almost in real time, it is possible to anticipate major problems and as better as possible manage resources and measures to be taken.

In the Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank, the European Economic and Social Committee and the Committee of the Regions concerning the financing of sustainable growth (European Commission, Brussels, 2018), it is presented an Action Plan which is part of broader efforts to connect finance with the specific needs of the European and global economy for the benefit of the planet and the society. The most important and urgent action of this plan was considered the elaboration of a unified EU classification system – or taxonomy – which to provide clarity on which activities can be considered sustainable, being essential in supporting the orientation of the flow of capital.

The EU's Taxonomy Regulation (Regulation (EU) 2020/852), which came into force in July 2020, creates a legal basis for the EU Taxonomy and presents six environmental objectives (climate change mitigation; climate change adaptation; the sustainable use and protection of water and marine resources; the transition to a circular economy; pollution prevention and control; and the protection and restoration of biodiversity and ecosystems) and four fundamental conditions an activity must meet to qualify as sustainable (contributes substantially to one or more of the environmental objectives; does not significantly harm any of the environmental objectives; is carried out in compliance with the minimum safeguards provided in regulation; complies with technical screening criteria that have been established by the Commission).

As mentioned by the EU Technical Expert Group on Sustainable Finance, "the need for a sustainable Taxonomy pre-dates the Green Deal, but it is an important enabler of the Green Deal's comprehensive sustainable economy reforms" and "the key environmental objectives are consistent between the Taxonomy framework and the economic sectors targeted for policy reform under the Green Deal" (EU Technical Expert Group on Sustainable Finance, March, 2020a).

The taxonomy key users are represented by the financial market participants offering financial products in the EU,

as defined in the Regulation (EU) 2019/2088, the large companies who are already required to provide a non-financial statement under the Non-Financial Reporting Directive (Directive 2014/95/EU, with subsequent amendments and completions), the EU and the member states, when setting public measures, standards or labels for green financial products or green (corporate) bonds.

The European Commission created the taxonomy compass, an information technology tool which facilitates the use of the EU taxonomy, by allowing users to navigate easily through its contents. The information is structured here using NACE (General Industrial Classification of Economic Activities within the European Communities) for industry classification.

As we can see in the Regulation (EC) no 1893/2006, with subsequent amendments and completions, the structure of NACE includes four levels (sections, divisions, groups and classes), covering 21 sectors and 615 classes of economic activities. Thus, NACE is derived from ISIC (International Standard Industrial Classification of All Economic Activities), which means that it has the same items at the highest levels (sections, divisions), but it is more detailed at lower levels (groups and classes).

In order to mark sustainability information, a digital taxonomy of sustainability reporting standards applicable in the European Union will be required. We must not make confusion between the EU Taxonomy, that is based on the Regulation (EU) 2020/852, being just a classification system for sustainable economic activities and the XBRL taxonomy needed, that is a dictionary that store, through labels, information on the names and identifiers of the concepts used in reporting and many other features that describe them, as well as information on the links between different concepts, which makes it easy for both humans and computers to understand the information communicated.

In the structure of the EU taxonomy for sustainable activities we find thirteen of the sectors of the economy (Arts, entertainment and recreation; Construction and real estate activities; Education; Energy; Environmental protection and restoration activities; Financial and insurance activities; Forestry; Human health and social work activities; Information and communication; Manufacturing; Professional, scientific and technical activities; Transport; Water supply, sewerage, waste management and remediation), and the environmental objectives pursued in these sectors aim at biodiversity, climate adaptation, climate mitigation, circular economy,

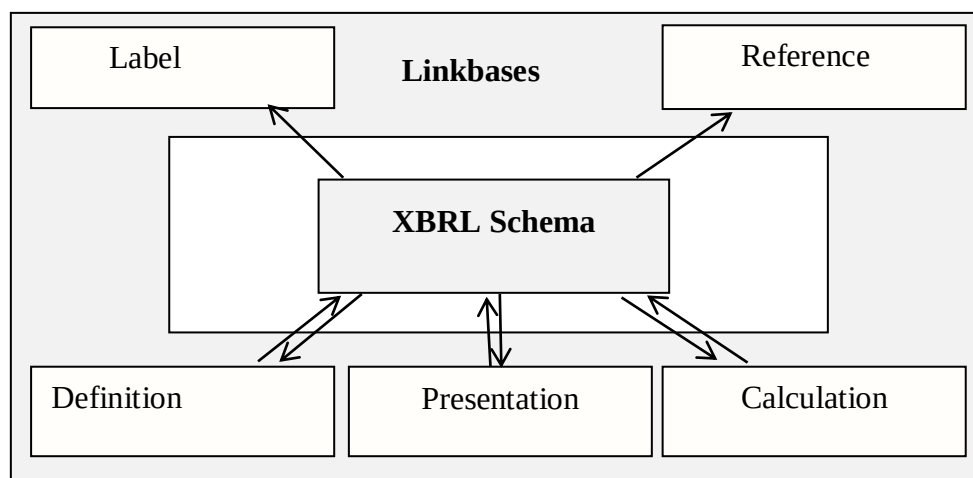
pollution prevention and water. Thus, in order to meet the EU's climate and energy targets for 2030 and reach the objectives of the European Green Deal, it is vital that we direct investments towards sustainable projects and activities (https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en).

The EU Technical Expert Group on Sustainable Finance recognizes that some important activities are not captured by the NACE codes (e.g. urban and regional planning for low carbon development including avoided journeys, support for lower carbon personal choices such as vegetarian diets, and investments to maintain public natural capital such as natural forests and wetlands) and some additions have been made in the taxonomy to the

existing NACE framework (EU Technical Expert Group on Sustainable Finance, March, 2020b).

The XBRL taxonomy is "a body of knowledge for some business domain expressed in a standardized electronic format" (Hoffman and Watson, 2010). It contains an XBRL schema (that stores information about taxonomy concepts), in the forms of an .xsd file, and linkbases, often referred to as layers (calculation, definition and presentation, that manage the relations between taxonomy concepts; label, that associate taxonomy concepts with text labels defined in various languages; reference, that connect concepts with authoritative literature), in form of .xml files (Debreceeny et al., 2009). In **Figure no. 1** we render the main components of an XBRL taxonomy.

Figure no. 1. The content of the XBRL taxonomy



Source: Own projection of the authors

XBRL revolutionized financial and non-financial reporting around the world and will have a huge impact in the European Union, which aims to reach high targets in a relatively short time, including sustainable development, while respecting the environment and citizens. Our paper tries to support the EU efforts in implementing the Green Deal, by providing a practical example on how digital technologies, more precisely, XBRL, can be introduced in the process of collecting information on circular economy from member states and processing it

in order to transform the EU into a society that will face the challenges of climate change, improving the quality of life.

2. Materials and methods

Following the indicative timetable from the roadmap of the key policies and measures needed to achieve the Green Deal (European Commission, Brussels, 11.12.2019), the European Commission adopted in March 2020 a new circular economy action plan.

Our research focuses mainly on the crosscutting actions related to “mainstreaming circular economy objectives in the context of the rules on non-financial reporting, and initiatives on sustainable corporate governance and on environmental accounting”, respectively on monitoring the progress by “updating the Circular Economy Monitoring Framework to reflect new policy priorities and develop further indicators on resource use, including consumption and material footprints” (European Commission, Brussels, 11.03.2020b). We mention that the circular economy objective has already been integrated into the EU's Taxonomy Regulation (Regulation (EU) 2020/852).

This first action under discussion is of particular interest because sustainability standards are essential for the scope of the Green Deal. In this regard, the European Commission has proposed the elaboration of a Corporate Sustainability Reporting Directive (CSRD) that envisages the adoption of EU sustainability reporting standards and requested that the European Financial Reporting Advisory Group (EFRAG) develop the draft standards on sustainability reporting.

For sustainability information to be as easily accessible and processed as financial information, similar classification methods and formats should be considered and this calls for enabling a digital XBRL taxonomy for EU sustainability reporting standards along the standard-setting process (European Lab Project Task Force, February, 2021).

ELPTF (European Lab Project Task Force, February, 2021) brings into attention the fact that the sustainability standards and disclosures are principle-based in nature, therefore the scope and size of the taxonomy should reflect: a) the granular disclosures required by sustainability standards (standardised tags); b) the entity-specific disclosures (extension tags); and c) the most common practice disclosures that are not derived from standards (common practice tags).

Based on EU taxonomy, which is a classification system for sustainable economic activities, and on the international digital sustainability reporting initiatives, we can create an XBRL taxonomy for EU sustainable activities. The taxonomy helps us to generate XBRL instances (reports in XBRL format) which can accelerate the decisional process as a result of the modular representation of the information.

In order to show the effects of using XBRL in reporting non-financial information, we built an XBRL taxonomy taking into consideration one of the environmental objectives in the EU taxonomy, more precisely, circular economy.

The concepts to be included in the main schema of this taxonomy, were identified by analysing different works published by renowned bodies that attempted to support the identification, measurement or quantification and reporting of non-financial information: Key Performance Indicators for Environmental, Social & Governance Issues: A Guideline for the Integration of ESG into Financial Analysis and Corporate Valuation (The European Federation of Financial Analysts Societies, 2009), Sustainability Reporting Guidelines (Global Reporting Initiative, 2011), Environment at a Glance Indicators – Circular economy, waste and materials (Organisation for Economic Co-operation and Development, 9 March 2020). Also, we analysed the content of some taxonomy already released for sustainability reporting around the world (<https://www.sasb.org/structured-reporting-xbrl/>, <https://is.aeca.es/en/xbrl-taxonomy/>, <https://www.cdsb.net/priorities/xbrl/xbrl-project-governance>).

There are currently a multitude of software products that allow working with XBRL taxonomies and instances, made available by companies such (<https://www.xbrl.org/>): Acstone, ADDACTIS Worldwide, Altova, AMANA consulting GmbH, Arkk Consulting Ltd., Batavia XBRL BV, CoreFiling, Ez-XBRL Solutions, Inc., Firesys GmbH, Fujitsu, GPM Systems, Invoke, Oracle, Reporting Standard XBRL, Semansys Technologies, UBPartner, Vizor Software etc. In

our study we chose to use three of the modules of the Altova MissionKit 2023 application (XMLSpy, MapForce and StyleVision) (<https://www.altova.com/>).

3. Results and discussions

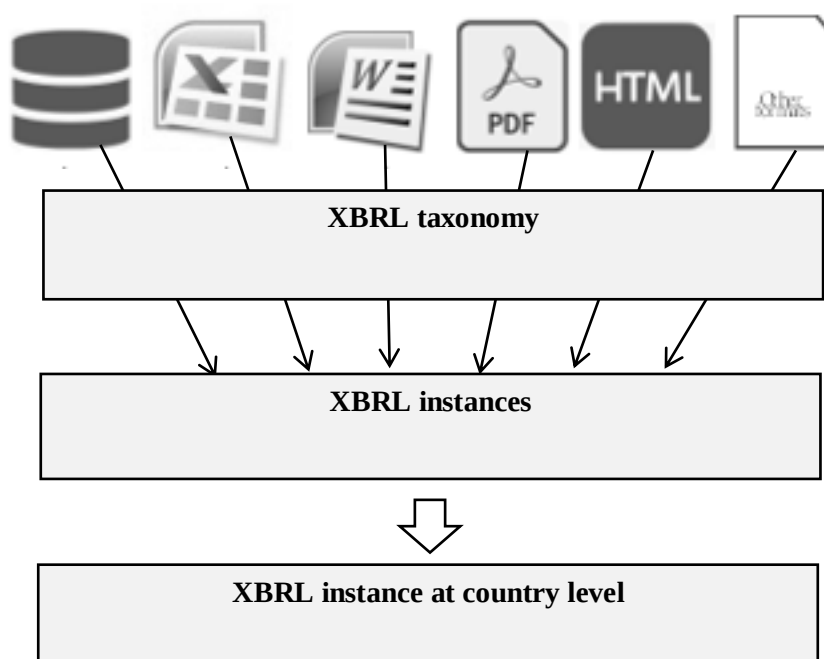
To create the taxonomy and validate its content we used the XMLSpy module (module that received from the XBRL International consortium the status of XBRL certified software). In the content of the taxonomy can be found: a schema file (eudir_20221231.xsd) and three linkbases files (eudir_lab20221231.xml eudir_pre20221231.xml, eudir_cal20221231.xml), where “eudir” represents an abbreviation for the European directives.

The XBRL Schema indicates different objectives of the European Green Deal and the types of

relationships between the elements used in determining various indicators characteristic to the circular economy, also including some declarations of concrete and abstract concepts. The linkbases files created indicate the links between concepts and their readable expressions in a given language (in our example, English), the relationships between concepts in terms of presentation in the sense of indicating their hierarchy and the relationships between concepts in terms of calculating some values.

Every country should make available an XBRL taxonomy for companies and institutions, which have obligations concerning the circular economy, in order to prepare their sustainability reports in this modern format (*Figure no. 2*) and to easily collect the information required by the European Commission.

Figure no. 2. Sustainability information collected at country level



Source: Own projection of the authors

In our example, after mapping the content of an Excel document to XBRL, using MapForce, we managed to

generate an XBRL instance in the field of sustainability reporting (*Figure no. 3*).

Figure no. 3. XBRL instance concerning the sustainability reporting (CircularEconomy.xml file)

```

<?xml version="1.0" encoding="UTF-8"?>
<xbri:xbri xmlns:eudir="http://www.europeandirectives.com/xbri/taxonomy/cor"
  xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:xl="http://www.xbrl.org/2003/XLink"
  xmlns:link="http://www.xbrl.org/2003/linkbase" xmlns:ref="http://www.xbrl.org/2006/ref"
  xmlns:xbrldt="http://xbrl.org/2005/xbrldt" xmlns:xbri="http://www.xbrl.org/2003/instance">
  <link:schemaRef xlink:type="simple" xlink:href="C:\Users\asus\Desktop\Instance\eudir_20221231.xsd"/>
  <eudir:WasteQuantity contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="kt"
    decimals="0">50000</eudir:WasteQuantity>
  <eudir:WasteQuantityCollected contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="kt"
    decimals="0">10000</eudir:WasteQuantityCollected>
  <eudir:WasteQuantityGenerated contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="kt"
    decimals="0">40000</eudir:WasteQuantityGenerated>
  <eudir:WastePercentageDiverted contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="pureRef"
    decimals="0">0.05</eudir:WastePercentageDiverted>
  <eudir:WastePercentageIncinerated contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="pureRef"
    decimals="0">0.20</eudir:WastePercentageIncinerated>
  <eudir:WastePercentageLandfilled contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="pureRef"
    decimals="0">0.10</eudir:WastePercentageLandfilled>
  <eudir:WastePercentageRecycled contextRef="TwelveMonthsEndedAt_31Dec2022" unitRef="pureRef"
    decimals="0">0.65</eudir:WastePercentageRecycled>
  <xbri:context id="TwelveMonthsEndedAt_31Dec2022">
    <xbri:entity>
      <xbri:identifier scheme="https://mfinante.gov.ro/ro/legal-persons/">99999999</xbri:identifier>
    </xbri:entity>
    <xbri:period>
      <xbri:startDate>2022-01-01</xbri:startDate>
      <xbri:endDate>2022-12-31</xbri:endDate>
    </xbri:period>
  </xbri:context>
  <xbri:unit id="kt">
    <xbri:measure xmlns:kt="http://www.xbrl.org/dtr/type/numeric-2009-12-16.xsd">kt</xbri:measure>
  </xbri:unit>
  <xbri:unit id="pureRef">
    <xbri:measure xmlns:pure="http://www.xbrl.org/dtr/type/numeric-2009-12-16.xsd">xbri:pure</xbri:measure>
  </xbri:unit>
</xbri:xbri>

```

Source: Own projection of the authors

Through the modular representation of information, XBRL aims, among other things, to reduce the asymmetry of

information resulting from the incompatibility of reporting formats worldwide (Premuroso and Bhattacharya, 2008).

Such a representation allows automating the process of synthesizing information in sustainability reports and generating reports almost in real time by aggregating information from various sources, as well as simplifying the process of information analysis by various users (public institutions, statistical institutes, financial auditors etc.).

This XBRL instance presented previously can be viewed in different formats (HTML, RTF, Word etc.) and even different languages if we create label taking into consideration the language specific to each Member State. The StyleVision module of the Altova MissionKit 2023 application helped us to present the instance in a human-readable format (*Figure no. 4*).

Figure no. 4. XBRL instance generated based on a model created with StyleVision

CIRCULAR ECONOMY	12 Months Ended 2022-12-31
Waste quantity collected	10000 kt
Waste quantity generated	40000 kt
Waste quantity – Total	50000 kt
Waste percentage diverted	0.05
Waste percentage incinerated	0.20
Waste percentage landfilled	0.10
Waste percentage recycled	0.65

Source: Own projection of the authors

XBRL allows for easily collecting sustainability information from different countries in the European Union, the risk of errors in manipulated data being significantly reduced. Thus, regardless of the language which the information is published, it can be automatically extracted and analyzed, using an appropriate software, and the results or measure to be taken can be presented to users, timeliness, in various types of reports.

4. Conclusions

The changes supported by the environment in the last years determined the European Commission to think to a new strategy of economic growth. This strategy, proposes through the European Green Deal, requires for urgent measure to be taken in order to protect the natural capital of UE and the health of citizens. In order to ensure an efficient and effective communication at the European level it is very important to clearly establish which are the activities that have a substantial impact over the

environment and to implement technologies capable to reduce this impact or to offer, almost in real time, the information necessary in taken the major decisions.

Given the extensive volume of information in XBRL taxonomies dedicated to sustainable reporting, in this paper we have chosen to design extremely limited variants of the content of an XBRL schema and some linkbases, but which to include the elements required by the XBRL standards and specifications, and the associated XML standards, in accordance with the requirements for the presentation of these elements, so that the verification and validation process using a dedicated software product (Altova MissionKit 2023) to proceed without any problem. Generating a more complex report based on the taxonomy created wasn't possible due to this limitation of our research.

Compared with other currently existing solutions (e.g. intelligent PDFs using eXtensible Markup Language, XHTML), XBRL allows for the improvement of decision-making process by reducing the possibility of errors due to

the automatic retrieval of data from different actors involved in the sustainability reporting process and reducing the time for analysis and interpretation of information collected from EU Member States because it is well structured and accompanied by well-organized electronic documentation which make possible easy preparing instances using the language specific to each

member state and processing the information almost in real time after it is sent to the European Commission.

The future directions of research focus on the use of XBRL software products in processing the XBRL instances from European member states and generating different types of circular economy reports (statistics, urgent measures to be taken, communications etc.).

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Digital Skills of Management Accountants:

A Comparative Analysis across EU Countries

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Abstract

The Fourth Industrial Revolution is bringing significant changes to the digital skill set required of management accountants. Thus, to continue ensuring the profession's relevance, academia and professional bodies constantly seek to update their curricula to meet the business environment's necessities. Thus, the present research aims to identify the digital skills management accounting practitioners need by examining the companies' requirements and determining whether there are significant differences between European Union (EU) member states regarding the countries' digital performance. This study adopts a mixed-methods approach by combining qualitative and quantitative research methods to achieve this objective. The results obtained from the undertaken analyses reveal that most companies consider necessary basic digital skills, such as the effective use of spreadsheet software and competencies related to integrated systems, Business Intelligence, database management systems, and data warehouse management systems. In addition, the comparative review reveals that in countries with a high level of digital performance there is a significant impact on the professional requirements, with no differences being identified between countries with a medium and low level of digital performance, emphasising the changing role of practitioners as a result of the extensive management accounting processes' digitalisation. The research findings consequently have a series of implications for academia, professional bodies, and companies.

Key words: digital skills; management accounting; accounting profession; job advertisements;

JEL Classification: J24, M41, O33

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Introduction

The management accountants' role underwent considerable transformations in the last decades due to technological developments and business environment changes, which became more complex and dynamic. The advancement in artificial intelligence (AI), process automation, and data analytics are driving changes in the management accountants' role and the required skill set. Within the context of the Fourth Industrial Revolution, also referred to in the literature as Industry 4.0, management accountants are presented with the opportunity to benefit from a range of new equipment and infrastructure that enables complex analytical methods to effectively pursue (1) the development of the optimal decision-making context, (2) budgetary control, (3) forecasting, and (4) the management of key financial and operational factors, contributing to this new paradigm through their skill set and professional judgement (Dai & Vasarhelyi, 2023).

In response to the business environment's dynamics and developments in the Information Technology (IT) field, professional bodies, whose role over time has been to maintain the relevance of the profession (King & Davidson, 2009; Tsiligiris & Bowyer, 2021), frequently update their curricula for future certified practitioners (Rîndaşu et al., 2023). Hence, the newest skills required by the professional bodies of management accountants relate to the effective use of AI, Blockchain solutions, Business Intelligence (BI), Internet of Things (IoT), process automation (RPA), mobile technologies, and data analytics solutions.

Even though international professional bodies continually engage with the business environment, Howcroft (2017) outlines that employers believe entry-level certified practitioners do not have all the necessary skills. Conversely, professional bodies consider that entry-level professionals are overqualified for the positions offered by the labour market as they need more opportunities to practise the skills developed during the university studies and certification process.

The skills gap between management accountants and the companies' demands continues to be an ongoing concern (Edeigba, 2022; Elo et al., 2023; Oesterreich & Teuteberg, 2019; Rajeevan, 2019), especially in a context where the practitioners' role and their career development are affected by the extensive digitalisation of processes (Wolf et al., 2020). Although previous studies have provided important insights into the digital skills gap between the companies' expectations and the management accountants' profile (Oesterreich & Teuteberg, 2019;

Wadan & Teuteberg, 2019) these findings are limited to one country, consisting of a limited set of digital skills and did not provide a comparative analysis between different states. Therefore, this research aims to identify the digital skills set required by companies and conduct a comparative analysis between European Union (EU) countries according to the digital performance of each nation. The authors firstly conduct a content analysis of 570 jobs to achieve this objective, examining the digital skills set and then wielding a comparative quantitative research method. Therefore, the current study provides an important contribution by deepening the understanding of the business environment dynamics that contribute to management accountants' transforming roles.

This paper is structured in four sections. The first section reviews the relevant literature on the profession's transformation, the evolution of the management accountants' career paths and the digital skill set, followed in section two by an overview of the methodological research framework. The third section outlines the findings and discusses the results. Lastly, the conclusions, limitations, and future research directions are presented in the final section.

Literature review

Digitalisation, as defined by Brennen & Kreis (2016) as "the way in which many areas of social life are being restructured around digital communication and media infrastructures", is one of the main drivers that is transforming the accountancy profession, leading to the generation of new roles and changes in the management accountants' career paths. Although the literature recognises digitalisation's impact on the profession, there are two perspectives through which researchers approach this transformation. The first view considers the development of the practitioner's role and the creation of new opportunities by shifting from the "bean counter" stereotype towards a business partner role (Andreassen, 2020; Tiron-Tudor & Deliu, 2021; Leitner-Hanetseder et al., 2021) focusing on new opportunities that accountants can leverage. In this context, Leitner-Hanetseder et al. (2021) argue that future practitioners must develop their skill sets to successfully engage in new jobs driven by advances in AI. The second perspective is contrary and assumes that a high degree of digitalisation will gradually lead to the processes de-professionalisation, which will no longer be associated with management accounting to the detriment of IT departments (Heinzelmann, 2018; Zhang et al., 2023).

By examining the new IT solutions' impact on the required skill set of entry-level accounting practitioners from both the executives' and junior professionals' perspectives, Jackson et al. (2022) discover that both groups comprehend the need for a well-defined set of digital skills for future career sustainability, emphasising the idea that in a context characterised by AI and RPA, entry-level accountants are more impacted by the transforming roles. Similarly, Schäffer & Weber (2017) suggest that digitalisation, standardisation, and process outsourcing determines companies to no longer nurture the traditional career development of management accountants by supporting their skills development.

In an attempt to provide a glimpse into the future of the accounting profession, Leitner-Hanetseder et al. (2021) consider that although the impact of digitalisation's evolution on the profession is difficult to quantify, an extensive collaboration between the human factor and IT solutions is emerging in the near future, with accounting teams being characterised by a collaborative ability, an increased level of openness, flexibility, and interdisciplinarity. In this context, digitalisation will empower management accountants to become effective business partners and contribute to sustainable performance, the skill set being focused on data analytics, AI, and data forecasting and visualisation techniques. Nevertheless, further analysis is needed as the role's transformation appears to be more complex than the scenarios presented in the digitalisation discourses, with the organisations' type as one of the main antecedents of the evolution of the management accountants' role (Carlsson-Wall et al., 2022)

Currently, shifts can be observed in how management accountants develop their career paths, with an increasing inclination towards short-term lateral career moves due to decreased employer loyalty (Thaller et al., 2023).

Digitalisation is one of the main drivers of this change in career paths and organisations must provide opportunities for practitioners to employ their skills. Thus, the role's transformation leads to changes in the necessary set of skills, with practitioners having to develop new competencies in addition to their core aptitudes to meet the new role challenges (Wolf et al., 2020).

The management accountants' skill set can be examined through three perspectives, considering the triad of universities, professional bodies, and the business environment. Although higher education institutions and professional bodies have been and continue to be

separate pillars of the accounting education, most university programs are accredited by or part of agreements with national and/or international professional bodies and associations, resulting in frequent changes in the curricula (Sarkar et al., 2021). This is because professional bodies and associations have a better collaboration with the business environment (Tsiligiris & Bowyer, 2021); thus, it is considered that they have more detailed insights into the companies' needs and challenges. Therefore, in response to the exerted pressure from companies, society, and competitors, higher education institutions are attempting to remain competitive to prepare professionals to meet the evolving IT challenges.

While academia consistently strives to provide relevant curricula that contribute to the future practitioners' sustainable career development, the literature indicates a gap between the accountants' skills and the business environment's requirements. By analysing the consistency between the competencies of more than 2300 management accountants, Oesterreich & Teuteberg (2019) discovered that the current practitioner's profile is inconsistent with the future role highlighted by the literature and professional bodies. Several factors may cause the existence of this gap. For instance, in the context of introducing a new IT discipline into an undergraduate accounting program, Sakar et al. (2021) identify the following challenges: lack of educators with the necessary skills, limited training activities, the difficulties and complexities associated with learning new IT solutions, and a lack of incentives for professional development. Conversely, Cheng et al. (2022) argue that this gap should not be attributed solely to academia, as there is a need for continuous collaboration between businesses, higher education institutions, and government representatives.

Lately, many researchers have been focused on examining the set of digital skills needed by accounting practitioners in the context of Industry 4.0 (Andreassen, 2020; Carlsson-Wall et al., 2022; Liu et al., 2021; Oesterreich & Teuteberg, 2019; Roozen et al., 2019; Spraakman et al., 2021). The most commonly reported competencies relate to effectively working with: solutions for data analytics and BI, data visualisation techniques, cloud computing platforms, Enterprise Resource Planning (ERP) systems, AI, RPA, and Blockchain solutions. Reviewing the evolution of the digital skills set in the syllabi of two major management accounting professional

bodies, Rîndaşu et al. (2023) uncover a similar set of competencies, outlining that the profile of management accountants in the context of process digitalisation focuses on six pillars: (1) supporting the organisation in the digital transformation processes, (2) understanding the key technologies that have significant potential for companies, (3) continuously developing the skill set, (4) leveraging digitalisation as a foundation for the decision-making process, (5) proposing strategies to address the disruptions caused by technological progress, and (6) protecting data and being digitally responsible.

Building on this literature review, this research aims to identify the skill set required by the business environment, examining the practitioners' digital profile comparatively across EU countries.

Research Methodology

Based on the research objective of examining the management accountants' profile in terms of digital skills in the context of EU countries, we sought answers to the following research questions:

RQ1. What are the digital skills required of management accountants in EU countries?

RQ2. Are there differences in the digital skills required of management accountants across EU countries?

In order to answer the first research question, we wielded an inductive approach using a cross-sectional qualitative method by analysing job advertisements targeting management accountants. To answer the second question, a quantitative research method was used to explore the differences in the digital skills set, employing nonparametric tests to determine whether there are significant gaps between countries according to their level of digitalisation.

Data collection

Job advertisements are an important source of data as they exhibit clear information about the tasks and responsibilities of available positions, reflecting companies' expectations of future employees (Kim & Angnakoon, 2016; Walińska & Dobroszek, 2021), thus allowing the examination of the accounting practitioners' required skill set.

Using international recruitment platforms such as LinkedIn and Glassdoor, as well as national platforms, 570 job advertisements were collected. Thirty ads were selected for each EU member country with a population of more than 5 million, thus excluding eight countries (Cyprus,

Croatia, Estonia, Latvia, Lithuania, Luxembourg, Malta, and Slovenia) from the analysis, as per the demographic data provided by Eurostat (2022).

Based on the quantitative paradigm and the concept of data saturation (Corbin & Strauss, 2015), the sample size for each country is appropriate given that no additional digital skills were identified after analysing a certain number of items set initially. In this study, given the principles proposed by Francis et al. (2010), an initial sample of 20 advertisements was set and ten more advertisements were examined for the stopping criterion.

The ads selection was random and manual, considering several conditions to ensure methodological relevance. Considering the hybridisation of accounting jobs determined by the management accountants' skills overlapping with competencies from the financial accounting field (Albu et al., 2011) and the blurred boundaries caused by the practitioners' role in transversal activities (Samanthi & Gooneratne, 2023), the jobs selection was not solely based on job title. Thus, we considered the existence of specific management accounting responsibilities such as budgeting, forecasting, costing, data analysis, and performance measurement (Albu et al., 2011; CIMA, 2023). Advertisements that did not target practitioners with accounting experience or education were excluded from the analysed sample. At the same time, to avoid bias in the dataset, a maximum of two different jobs from the same company at the country level and a maximum of four advertisements from the same employer at the EU level were selected.

Taking into account the considerations outlined above, no automatic data retrieval methods have been used. Such a result based on the analysis of the position title alone could have contained erroneous data, with advertisements referring to positions in the financial field, such as accountant or cost manager, but requiring future employees to hold a degree in the construction field. While the job responsibilities referred to estimating production costs, preparing and monitoring budgets, and implementing new methods for building budgets, these positions did not refer to accounting professionals.

Data analysis

The selected job advertisements were examined by using content analysis, which is an extensively employed method for collecting data through the classification of text items (Ott, 2023).

Most of the ads were collected from LinkedIn, where the ads are often structured in four sections. The first section includes the job title, company name and company details (industry and number of employees), as well as the level of experience required of the candidates. The second section contains a description of the activities related to the position, with most companies including here the main responsibilities and less frequently mentioning the IT solutions to be used by future employees. The third section contains details of the competencies required of the practitioners, including all the aspects employers consider crucial for accomplishing the job responsibilities. The last section, typical for most workplaces, describes the companies and their missions. For this study, mainly the first three sections were analysed.

As identifying the digital skill set implies examining the requirements in the context of the position and terms used in practice, manual analysis and coding are considered more appropriate assessment methods (Ott, 2023). As digital competencies and IT solutions have been identified, they have been included in the digital skills set required. In

cases where the advert included IT solutions covering more than one skill, all of the specific competencies were considered. The coding was performed as follows: if any requirements for the skill were identified in the advertisement, it was assigned a value of 1; otherwise, it was assigned a value of 0.

The companies have been divided into two categories (services and manufacturing) according to the sector in which they operate, with organisations from more than 200 fields being analysed; in terms of the number of employees, the majority of jobs examined (67.02%) is offered by companies with more than 1000 employees (**Table no. 1**). Concerning the level of experience, most of the advertisements targeted practitioners with at least three years of experience (associate level – 34.21%) and between five and seven years (senior level – 32.11%); 102 advertisements referred to practitioners at the beginning of their careers, with no more than two years of experience in the field, and 84 of the jobs targeted executive positions. For six jobs we could not identify the level of experience sought by the employers.

Table no. 1. Details of the jobs sample analysed

Number of employees / Industry	Manufacturing (M)	Services (S)	Total
1-10	0	2	2
11-50	6	21	27
51-200	18	40	58
201-500	14	38	52
501-1000	14	35	49
1001-5000	51	86	137
5001-10000	23	25	48
Above 10000	110	87	197
Total	236	334	570

Source: Own processing based on the data collected

Results and discussions

The study's objective is to examine the business requirements that shape the digital skills set needed by management accounting practitioners. After reviewing 570 job advertisements from 19 EU member countries, we identified 54 ads (9.47%) for which no digital skills could be identified due to the requirements' ambiguity or the absence of any mention within the advertisements. A few examples which reflect the lack of clarity are the following: "IT skills and responsiveness to evolving IT systems", "[...]

strong interest and experience in using IT tools", and "relevant IT skills".

An overview of the main identified competencies is presented in **Table no. 2**. The most frequent of these is represented by basic digital skills, such as proficiency with spreadsheet software and other MS Office Suite (MSO) applications, encountered in 431 ads (75.61%). As can be noticed, these basic digital skills are found across all types of industries, regardless of the company size. Although some businesses with a certain level of digital maturity are moving away from using spreadsheet software and opting

to use integrated systems, these basic IT solutions remain relatively popular. This result is consistent with previous studies (Rîndaşu, 2021; Schmidt et al., 2020), observing further resistance to adopt new, more appropriate data analysis and visualisation solutions.

As can be noticed, the competencies with integrated systems such as Enterprise Resource Planning (ERP) are the second most requested skill (51.58%), the prevalent requested solution being the one offered by SAP SE. Some of the advertisements examined mentioned the modules that future employees are expected to know, the most common being SAP FI and SAP CO, although the majority of companies omitted to specify this. In cases where modules such as SAP BW or SAP BPC were specified, these skills were considered part of the Business Intelligence (BI) category and the Accounting and Performance Management Information Systems (AIS/BPC) category. In the case of 12 advertisements, it was observed that companies prefer professionals with experience in implementing ERP systems, which is a critical success factor when adopting new solutions (Alsharari et al., 2020). Thus, companies that prefer candidates previously involved in such activities might easily overcome the specific associated challenges.

Although AIS/BPC have a similar utility to some of the modules available in the ERP systems, they have

been presented separately because the advertisements did not always specify an integrated solution and, in the analysed cases, skills related to such specific software were required.

The following most frequently identified competencies referred to working with BI solutions (24.91%) and database and data warehouse management systems (DBMS&DW – 12.80%). In comparison with the previous study conducted by Rîndaşu (2021), it can be seen that the prevalence of these types of skills is significantly higher than in the previous periods. This result may be explained by the fact that management accounting practitioners, as opposed to financial accountants, have to demonstrate a higher level of data analysis and interpretation skills.

The following three types of competencies identified relate to the use of data analysis (DA), process automation (RPA), and data visualisation (DV) techniques. Although these are relatively less common than the skills presented above, it can be seen that the set of digital competencies required of management accountants is expanding to enable practitioners to successfully fulfil their role as business partners (Andreassen, 2020; Tiron-Tudor & Deliu, 2021; Leitner-Hanetseder et al., 2021).

Table no. 2. Identified digital skills

Number of employees (Industry)/ Skills	MSO	ERP	BI	AIS/BPC	DBMS&DW	DA	RPA	DV
1-10 (S)	1	1	0	0	0	0	0	0
11-50 (M)	5	4	2	2	1	0	0	0
11-50 (S)	12	4	3	6	1	1	2	0
51-200 (M)	12	10	7	1	3	1	1	0
51-200 (S)	33	14	10	2	4	1	0	0
201-500 (M)	12	11	5	2	3	1	1	0
201-500 (S)	27	15	7	9	6	5	1	0
501-1000 (M)	6	10	5	2	2	2	0	0
501-1000 (S)	26	14	7	4	6	2	0	4
1001-5000 (M)	38	37	12	5	5	3	2	1
1001-5000 (S)	70	35	23	9	12	10	2	3
5001-1000 (M)	18	14	6	2	0	4	1	0
5001-1000 (S)	15	11	3	4	2	3	2	1
Above 10000 (M)	87	77	33	8	15	6	4	3
Above 10000 (S)	69	37	19	8	13	8	3	4
Total	431	294	142	64	73	47	19	16

Source: Own processing based on the data collected

Besides these eight types of skills, sporadically, we encountered competencies related to programming languages (LP – 9 ads) and project management IT solutions (PM – 9 ads). Two of the advertisements reviewed referenced decentralised registries (DR) – Blockchain, with one advertisement requiring practitioners to have in-depth knowledge of operating systems (OS) and one item mentioning competencies related to cloud computing platforms (CC).

To determine whether there are significant differences between EU countries according to the level of digitalisation in each country, as assessed by the European Commission's Digital Economy and Society Index (DESI) (Eurostat, 2022), all countries were classified into three categories based on their level of digitalisation. The first category includes states with higher digital performance, the second category refers to countries with

an average performance, and the last category refers to countries with a low level of digitalisation. K-Mean Cluster statistical analysis was used to perform the classification, for which an initial number of three clusters and a maximum of ten iterations were set ($F=84.942$, $p<0.01$). A score based on the number of skills was calculated for each of the ads in the sample. For jobs where no digital skills were mentioned the score was 0 and for the other jobs, depending on the number of skills, the score ranged from 1 (one skill identified) to 5 (five skills identified). The nonparametric Kruskal-Wallis H test was employed to determine whether there were differences between the means of these groups, with the results presented in **Tables 3 and 4**. The Levene test was used to assess whether the dataset meets the assumption of homogeneity of variance ($p=0.166>0.05$), thus rejecting the null hypothesis.

Table no. 3. Ranking of advertisements according to the country's level of digitalisation

	Digitalisation_level	N	Mean Rank
Digital_score	High	180	259.41
	Medium	210	299.34
	Low	180	295.45
	Total	570	

Source: Own processing using SPSS V.18

Table no. 4. Test Statistics^{a,b}

	Digital_score
Chi-square	7.200
df	2
Asymp. Sig.	.027

a. Kruskal Wallis Test b. Grouping Variable: Digitalisation_level

Source: Own processing using SPSS V.18

As can be observed, there are statistically significant differences ($p=0.027<0.05$) between the three categories of countries examined, but with a low effect size ($\eta^2=0.013$). In order to

determine which of the categories has conclusive differences, we used the Mann-Whitney U nonparametric test to compare the groups two by two (**Table no. 5**).

Table no. 5. Test Statistics^a

	Digital_score (High vs. Medium)	Digital_score (Medium vs. Low)	Digital_score (High vs. Low)
Mann-Whitney U	16213.50	18681.00	14189.50
Wilcoxon W	32503.50	34971.00	30479.50
Z	-2.527	-.205	-2.111
Asymp. Sig. (2-tailed)	.012	.837	.035

a. Grouping Variable: Digitalisation_level

Source: Own processing using SPSS V.18

Based on the comparison between groups, it can be noted that there are statistically significant differences between countries with a high and medium level of digitalisation ($p=0.012<0.05$) and a low level of digitalisation ($p=0.035<0.05$), with no significant gap between the last groups. This result highlights that in countries with a higher level of digitalisation, there is a significant impact on the professional requirements, most likely due to the increased level of competition and the organisations' needs to use more IT solutions to increase the performance measurement's quality. At the same time, considering that most of the jobs examined were offered by multinational companies, an impact of globalisation can be expected, leading to an increase in skills. The lack of a statistically significant difference between countries with a medium and low level of digitalisation can be explained by the fact that organisations from countries with a lower digital performance try to close this gap by digitally transforming their businesses.

Conclusions

This research aimed to examine the digital skill set required of management accountants by employers and to examine comparatively whether there are significant differences between EU countries. To achieve the research objective, an inductive approach was initially employed, applying a qualitative research method to identify the digital skills required of the management accountants, while quantitative methods were applied to examine whether there are significant differences in the skill set depending on the countries' level of digitalisation.

The initial assessment revealed 13 types of skills, the most common referring to basic digital skills, ERP systems, and business intelligence solutions, as well as skills for working with databases and data warehouses, data analysis, and visualisation techniques. Comparing the results obtained with the set of digital skills defined by the relevant international professional bodies (Rîndaşu et al., 2023), it can be noticed that there are no relevant differences. The comparative analysis conducted revealed that although the countries' level of digitalisation contributes to the increasing need of organisations to hire higher level digital skills practitioners, even in countries with lower digital performance companies emphasise the need for an adequate skill set, a fact that may be caused by the goal of fostering competitive advantages in an economic environment characterised by globalisation and

standardisation. Thus, these results point to the changing profile of management accountants in the context of Industry 4.0, where practitioners need to demonstrate an optimal level of digital skills to meet the demands of their role as business partners. While skills related to emerging technologies such as cloud computing platforms, decentralised ledgers and process automation solutions are less common, the expectation is that this outcome will change in the near future.

The study's findings could be used to draw several implications for academia, professional bodies, and companies. The profession's relevance can be further ensured through an up-to-date accountancy education that manages to prepare practitioners with an appropriate set of skills. Therefore, higher education institutions and professional bodies need to continuously dialogue with the business environment as the increasing degree of digitalisation may lead to a de-professionalisation of the specific management accounting processes. At the same time, companies must formulate precise requirements so as to avoid the emergence of a gap between the skills required in accounting education and those needed in the professional context.

The main limitation of the current research is related to the companies' level of transparency regarding the requirements set out in the job advertisements. Rieg et al. (2023) consider that the job description and competencies called for in recruitment advertisements may be intentionally limited, as companies aim to attract as many candidates as possible, followed by more thorough filtering in the later stages of selection. Therefore, we do not exclude the possibility that jobs may involve additional digital skills that were not included in the advertisements, either as these skills are to be learned on the job or because those were not considered highly relevant. Therefore, future research could target why employers prefer to limit the digital skills required of management accounting practitioners.

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