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ESG and their influence on companies' financial performance

SUMMARY

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List of abbreviations

BVB – Bucharest Stock Exchange

CFI – Comparative Fit Index

CSR – Corporate Social Responsibility

CSRD – Corporate Sustainability Reporting Directive

E – Environmental

EFRAG – European Financial Reporting Advisory Group

ESRS – European Sustainability Reporting Standards

ESG – Environmental, Social, Governance

G – Governance

GES – Greenhouse gas emissions

GRI – Global Reporting Initiative

IFRS – International Financial Reporting Standards

NFRD – Non-Financial Reporting Directive

PRI – Principles for Responsible Investing

RMSEA – Root Mean Square Error of Approximation

S – Social

SEC – Securities and Exchange Commission

SRMR – Standardized Root Mean Square Residual

TLI – Tucker-Lewis Index

UN – United Nations

Introduction

Sustainability has become, in recent years, a central discussion topic for the whole society. From citizens, local or central authorities to large corporations, every participant in the good running of society tries to carry out activities that minimize carbon dioxide emissions, pollution or, in general, the impact on the environment. Moreover, these activities must not lead to a major social impact, such as affecting the safety and health of people or the violation of human rights, and, in the long term, they should lead to sustainable, harmonious growth and development, without jeopardizing the future of the following generations. So, the universally accepted definition of sustainability is the ability to maintain or support a continuous development process in the long term without compromising the needs of future generations. In the field of Finance, one of the key factors of sustainable development is sustainable finance or green finance, which contributes to the growth of the circular economy.

Regarding the companies' sustainability, in recent years it has been used in parallel and practically as a synonym for the concept of ESG (Environmental, Social and Governance) factors, surpassing in popularity even the term corporate social responsibility (CSR). In reality, these factors are related to the non-financial sustainability of the companies rather than the financial one, given the fact that no financial information about the company is found in any of these factors. Essentially, they are a trio of standards used by investors to measure a company's sustainability and social and environmental impact.

In relation to sustainable finance and the integration of ESG factors in the investment decision-making process, the European Commission together with BlackRock explain these factors in a study (European Commission. Directorate General for Financial Stability & BlackRock Financial Markets Advisory, 2021) as follows:

- **Environmental factors** can represent those factors that contribute to mitigating climate change and adapting to it, promoting the circular economy, as well as preserving biodiversity or preventing pollution;
- **Social factors** can be related to issues about inequality, human rights, social inclusion or investment in human capital and communities;
- **Corporate governance factors** take into account the ability of the management of public or private institutions to include environmental and social factors in the decision-making process at company level and can refer to: the existence of management structures, the relationship with employees or the remuneration of executive members.

The concept of ESG factor is, however, a relatively new one, the first mentioning of the term being in a 2004 United Nations report (United Nations, 2004), and within this report recommendations were issued regarding the effective integration of ESG factors in investment decision-making, financial analysis and research. These factors are meant to help generate fair financial results for all stakeholders, namely shareholders, employees, suppliers, customers, banks and governments. Recently, the European Commission proposed a legislative package for gradual financing of companies to be stimulated or guided towards sustainability. Specifically, this legislative package addresses four important aspects, namely, fiscal stimulation to promote the green economy, changes to the legislative framework for non-compliance with sustainability norms, transparency in non-financial reporting and, last but not least, ESG regulation as a decision-making factor for investors.

Topic of the thesis and the field(s) / discipline(s) in which it integrates

The topic of the doctoral thesis is closely related to the future of non-financial sustainability of companies, subject to increasingly strict and complex standards and regulations at regional and global levels. It is relevant for investors, financial managers, government decision-makers, entrepreneurs, but also for the general public, increasingly concerned with sustainability in general. Therefore, a better understanding of ESG factors as determinants of green finance is needed in the context of their influence on economic-financial performance.

Given the novelty, complexity and continuous change over time of the ESG concept, but also the lack of data over a longer period of time, there are relatively few studies on the influence of ESG on the financial performance of companies. At the same time, existing studies reveal mixed, contradictory results. A meta-study of reference in the specialized literature is that of Friede et al. (2015), who show that most empirical studies at the time concluded that there is a positive relationship between the non-financial and financial performance of companies. These studies were the basis for the large-scale adoption and integration of ESG considerations in the investment process. Recent studies, on the other hand, as the analysis of the specialized literature in each chapter of this thesis reveals, show an inconsistent relationship over time between non-financial performance, measured by ESG scores, globally or regionally, and financial performance.

The scientific novelty of this work is given, on the one hand, by the approach within the research to the concept of ESG as a risk for companies, through the dimensions of exposure to ESG risks and their management, and, on the other hand, by the analysis of this concept in a multi-dimensional context, both globally and regionally, but also of uncertainty, generated by the Russian-Ukrainian war.

Objectives of the thesis and research methodology

The purpose of this paper was to determine the influence of ESG factors on companies' financial performance. In order to achieve this goal, the aim was to quantify the influence of ESG factors on companies' main financial indicators through advanced quantitative data analysis techniques and methods, but also through qualitative content analysis methods, conducted prior to the quantitative analyses. The type of research, methodologies used and the objectives pursued are summarized in Table 1.

Table 1: Research objectives and the methodologies used

Nr. crt.	Type of research	Methodology	Chapter	Objective(s)	Sample
1	Mixed (Qualitative/ Quantitative)	Content analysis	3	O1. Quantify the environmental disclosure degree of Romanian-listed companies' sustainability reports.	n = 23 t = 2 years
2	Quantitative	Comparative analysis	3	O2. Analyse the year-on-year evolution of Romanian-listed companies' environmental disclosure and ESG performance.	
3	Quantitative	Correlation analysis	3	O3. Determine the correlation between environmental disclosure, ESG scores and financial performance for Romanian-listed companies.	n = 21 t = 1 year
4	Quantitative	Cluster analysis with hierarchical and partitional methods	4	O4. Group the analyzed companies according to their financial and non-financial characteristics.	n = 2177 t = 5 years
5	Quantitative	Panel data analysis	4	O5. Quantify the influence of ESG on companies' financial performance.	n = 2177 t = 5 years
6	Quantitative	Cross-lagged panel model	5	O6. Quantify the influence of ESG scores on firm value for companies in the automotive industry.	n = 131 t = 6 years

7	Quantitative	Panel data analysis	6	O7. Determine the influence of remaining in/withdrawal from an aggressor state on companies' ESG scores.	n = 559 t = 1 an
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Source: Author's work in Microsoft Word

First, content analysis was used to determine the degree of disclosure of non-financial environmental information from the sustainability reports of the 23 companies in the sample, in the period 2021 – 2022. Content analysis is a research method used to analyze the content of various forms of communication, whether written, verbal or visual. It involves the systematic study of texts or other forms of communication to identify patterns, themes, and meanings in the content. In this chapter, content analysis was applied to the previously mentioned reports to determine the number of environmental disclosures, using the GRI 300 Standard for the environment as a benchmark. In this sense, the applied content analysis was of a quantitative type because the final result was given in the form of numerical data (degree of disclosure). Subsequently, a year-on-year comparative analysis was applied, at sector and total sample level, to determine the evolution of the degree of disclosure of non-financial environmental information, but also of ESG performance, from the point of view of exposure, management and ESG risk of BSE listed companies. Due to the limitation regarding non-financial and ESG data, the comparative analysis of the evolution of the degree of disclosure of environmental non-financial information was carried out for the period 2021 – 2022, and that of the evolution of ESG performance for the period 2022 – 2023. In finally, due to the small number of observations, a correlation analysis with Pearson coefficients was performed, for the non-financial and financial variables, only at the level of 2022 because this was the only year with complete information. Correlation analysis is a statistical method used to measure and describe the relationship between two or more variables. It assesses the degree of association or dependence between variables, but it does not imply causality, only the intensity, strong or weak, and the nature, positive or negative, of the relationship between the variables. At the same time, the statistical significance of the coefficients obtained by the Student t-test was tested.

In order to study the influence of ESG factors on global financial performance, a methodology combining cluster analysis and regression analysis with panel data was applied in the fourth chapter. The motivation for using cluster analysis comes from its ability to identify distinct groups in a data set, based on similarities or differences between the variables under consideration (Ruxanda, 2001). In the context of the ESG-financial performance relationship, this methodology allowed the classification of companies into homogeneous groups based on their financial and ESG risk characteristics. In doing so, trends in the formation of these clusters were determined, providing valuable insights into how different levels of ESG risk, exposure and management can affect financial performance.

Complementing cluster analysis, panel data regression techniques provided a robust framework for quantitatively assessing the relationship between ESG and financial performance, while accounting for other potential firm-specific characteristics and temporal dynamics. To determine companies that have similar ESG and financial characteristics, the study used both hierarchical clustering and partitioning methods on annually split datasets with standardized variables. First, hierarchical methods, as a means of unsupervised learning, helped identify how companies cluster without knowing the optimal number of clusters *a priori*. The analysis was performed first on the latest annual data set, i.e. 2022, and then on previous years to visualize and potentially test the stability of the clusters. First, the data were standardized, Euclidean distances were calculated and the Ward method for clustering was applied, given that this method optimally obtains clusters with equal variances and sizes. To determine the optimal number of clusters, indices from the NbClust package of R Studio were subsequently calculated. After determining the optimal number of clusters for the data set using hierarchical methods, partitioning algorithms were also applied (*k-means*), as a means of supervised learning; subsequently, the results obtained by both methods were compared to validate the stability of the clusters. Unlike hierarchical clustering methods, partitioning algorithms require the *a priori* knowledge of the number of clusters. Once the clusters were determined, panel data regression methods were applied to both the full sample and the resulting clusters to determine the influence of ESG factors on financial performance in both scenarios.

The research in the fifth chapter used cross-lagged panel structural equation modeling. Compared to other conventional models, such as time series modeling or linear regression models, structural equations allow a better specification of the interdependencies between variables (Kline, 2023) and which ultimately more accurately highlight the relationships and causal mechanisms (Chin, 1998). The analysis was performed with R Studio using the *lavaan* package (Rosseel, 2012). The cross-lagged panel structural equation model is a subcategory of the general structural equation models and is suitable for determining the lagged effects of one variable on another variable. In this chapter, concretely, the lag effect of the independent variables in year T, namely, the E, S, G or ESG rating in year T, on the value of the company in year T+1 was determined, taking into account the value of the company in T. In addition, this approach also allowed testing for reverse causality. The analysis carried out involved the use of 4 models, one for each independent variable, with the dependent variable being the value of the company.

In the research of the sixth chapter, four regression models were estimated with panel data, two for each research hypothesis. The aim was thus to determine the impact of the withdrawal or continuation of economic activity from/in Russia on the two variables of interest, namely the ESG rating and the Social rating. The main dependent variables were the absolute changes in the ESG rating (ΔESG) and the Social rating (ΔS), respectively, after 3, 6, 9 and 12 months, compared to the last available scores for the companies before the

outbreak of the war (February 2, 2022). The intervals chosen should allow enough time for the firm to make an informed decision about the implications of the war and for the ESG rating provider to update its scores to reflect this information. Controls such as firm size, financial performance, firm activity/operations in Russia, risk and market performance were used in all models. Specifically, the control variables used were: the natural logarithm of total assets, return on assets, the share of companies' revenues made in the Russian Federation in their global revenues, the market capitalization/equity ratio and the degree of indebtedness. In addition, country-level and industry-level factors were controlled for using two-digit variables.

The results of the elaborated research led to the achievement of the set goal and objectives, detailed in each chapter of this work.

Structure (chapters) of the thesis

In terms of structure, the thesis comprises six chapters. The first two chapters introduce the theoretical and contextual issues, specific to the field, which provide a better understanding of the concept of ESG and the framework in which ESG ratings have evolved to date. The third chapter presents the first research conducted in the paper, namely, *The relationship between non-financial reporting, ESG ratings and financial performance. A case study of companies listed on the Bucharest Stock Exchange*. The fourth chapter is the analysis of the influence of ESG ratings on financial performance on a significant, global sample of companies using cluster analysis and panel data regression methods. The fifth chapter examines the influence of ESG ratings on financial performance in the automotive sector, a sector that will face a number of fundamental changes, particularly in terms of sustainability, and where empirical evidence on this influence is relatively scarce. The sixth chapter addresses the uncertainty caused by the Russian-Ukrainian war and analyses the effect of continued or discontinued economic activity in the Russian Federation on ESG scores. The last part of the paper is devoted to general conclusions, personal contributions, limitations and future research directions.

The first chapter introduces the concept of corporate social responsibility as a precursor to ESG, compares the two terms, and then explains, using the literature, the widespread adoption of ESG in the context of responsible investment. Finally, a summary of the materiality and risks of ESG, described from the perspective of each pillar: environmental, social and corporate governance, is provided.

The second chapter explains the need for non-financial reporting by companies as a basis for assessing sustainability performance and ESG ratings. First, it summarises the most important standards and types of non-financial reporting globally, according to the stakeholders to whom they are predominantly addressed. It then outlines the current limitations of non-financial reporting, the most important of which are greenwashing and the multitude of standards that exist globally. In this context, the most important European legislative initiatives are then presented as solutions to the limitations presented. Finally, the general steps in calculating ESG ratings are presented and a summary of the most important ESG rating agencies and their most important methodologies is given.

Continuing the theoretical framework set out in the first two chapters, the remaining chapters represent the empirical research carried out in the context of the PhD thesis, and their sections are divided according to the following structure:

- Research context and role within the PhD thesis;
- Status of the literature;
- Research objectives and hypotheses;

- Data used;
- Research methodology;
- Results and discussion;
- Conclusions, limitations and future research directions.

The third chapter is the first empirical study in this thesis. Globally, companies are increasingly reporting non-financial information, guided by increasingly stringent regulations and standards. At regional level, in Romania, companies with more than 500 employees are obliged to report non-financial information by Directive 2022/2462, which has already been transposed into national law by the Ministry of Finance Order no. 85/2024. The way in which this reporting is carried out is, however, somewhat divided and chaotic, with each company reporting using either one or more reporting standards or not at all. This situation is intended to be improved by new European regulations such as the CSRD or the EU Sustainable Finance Taxonomy. It is noted, however, that most listed companies use GRI standards for their non-financial reporting. The study in this chapter represents the first research in Romania on the level of non-financial environmental reporting, the evolution of ESG ratings and their correlation with the financial performance of companies listed on the stock exchange. Its aim, in the context of the PhD thesis, is to provide regional evidence on the global trend of non-financial reporting together with ESG performance ratings and their relationship with financial performance. Specifically, this chapter studies the evolution of non-financial environmental disclosure over the period 2021-2022, and the ESG performance of Romanian-listed companies over the period 2022-2023, as well as the correlation with financial performance given by return on assets, return on equity, market capitalization and Tobin's Q. Companies' level of disclosure is determined using GRI 300 standards for the environment, given that most companies consider environmental reporting to be the most important of the 3 ESG pillars (US Sustainable Investment Forum, 2020).

The fourth chapter is a broad, global investigation over a significant period of time of the influence of ESG, as measured by risk, exposure and management scores, on key indicators of corporate financial performance. In recent years, the integration of ESG factors into business strategies has attracted significant attention from investors, regulators and corporations themselves globally. While traditional financial performance indicators remain key, there are growing views that company performance should also be assessed through the lens of their environmental, social and corporate governance practices, which will soon be regulated. This paradigm shift has sparked interest among researchers, investors and stakeholders alike in exploring the relationship between ESG factors and financial performance. However, the precise nature of the relationship between ESG practices and financial performance remains a matter of debate. In addition, while financial performance can be measured using well-established indicators, no consensus has yet been reached

when it comes to measuring ESG performance, as several ESG rating providers use their own methodology in calculating these scores. Against this backdrop of complexity and uncertainty, the research in this chapter aims to assess the influence of ESG on financial performance from a new perspective, that of ESG risk and its two dimensions: exposure and management, using a rigorous methodology that combines cluster analysis and regression techniques with panel data on a significant, global sample of companies from different industries and regions. Leveraging a significant new dataset and using a rigorous methodology, this study contributes to the ongoing dialogue on sustainable investing in general and ESG and its impact on financial performance in particular, promoting a positive impact for both companies and society. Specifically, this study attempts to answer a few key questions: How do companies cluster, i.e. which clusters are formed based on their financial and ESG risk profiles? What is the relationship between ESG risk and financial performance in these clusters and in the overall sample? In addition, how do contextual factors such as firm size and leverage influence this relationship? As a first step, a clustering of companies according to their financial and non-financial characteristics is performed using cluster analysis with hierarchical methods and partitioning algorithms. Then, the panel data regression method is applied to quantify the influence of ESG ratings on financial performance indicators, both at the level of the identified clusters and at the level of the total sample.

The next chapter, the fifth, aims to quantify the influence of ESG on financial performance indicators at the level of the automotive sector on a global, representative sample of companies. One of the biggest scandals in the automotive industry was the "Dieselgate" scandal, which had a very negative effect on the industry, but especially on Volkswagen, which reported false emission figures for cars produced and sold. In financial terms, the effects were reflected in the stock market as a negative shock. This is a classic example of an ESG risk materialising in negative financial effects. Given that the automotive industry will face a number of fundamental changes in the coming years with the shift to electric vehicles and the potential production of autonomous cars, companies need to better address sustainability issues, divided into ESG, environmental, social and governance aspects, to avoid negative shocks as in the past. In this context, studies on the influence of ESG on economic and financial performance in this sector are limited. This case study represents a first research on this topic on a significant number of companies in this sector. Therefore, this chapter examines the influence of ESG ratings on firm value as an indicator of economic and financial performance, and in the context of the PhD thesis, the research provides empirical evidence from a specific industry. Structural equation modelling, a relatively new method for exploring causal relationships between variables, was used to achieve the research objectives.

The sixth and final chapter investigates the impact of continued or discontinued economic activity in the Russian Federation on ESG ratings. More than two years after the start of the Russian-Ukrainian war, countries and companies continue to adjust to this unprecedented disruption of the global economy and associated uncertainty. Following the invasion of Ukraine by the Russian Federation on 24 February 2022, a considerable number of Western companies have decided to discontinue their activities in the Russian Federation, as a form of protest against the invasion of an independent and sovereign European country, but also guided by the sanctions imposed on the Russian Federation by Western states. This disruption of economic activity involved the divestment or sale of businesses or, alternatively, the complete abandonment of production and distribution units in the Russian Federation. Some companies have only announced their intention to leave after a certain period necessary to ensure an orderly transition, while others have decided to continue their activities in Russia, apparently unaffected by the unfolding events. The motivation for this research stemmed from the belief that the general public, financial markets and investors would express their disapproval of the Russian Federation's aggression in Ukraine, and that continued economic activity in an aggressor state would raise moral concerns, particularly on human rights issues. So the question arises whether companies that choose to stay in Russia would face a reduction in their ESG ratings, with the social component playing an important role in the construction of these indicators. In the context of the PhD thesis, these ratings are considered a measure of non-financial performance, which can ultimately affect a company's profitability, so determining new factors influencing these ratings opens new research perspectives. This chapter assumes that, in theory, ESG ratings are a quantification of a company's sustainability performance, and that doing business in an aggressor state could pose a social and human rights risk. Quantification of this influence is done using regression analysis on panel data obtained from, among other sources, the Yale School of Management and the Kyiv School of Economics.

The last chapter is followed by the presentation of the general conclusions of the PhD thesis, the original contributions, the general implications of the research results and their limitations.

The 134 pages of the thesis include 29 tables and 25 figures, listed at the beginning of the thesis. Given the nature of the topic chosen and the methods used, a list of abbreviations and notations used throughout the thesis can also be found at the beginning of the thesis. The thesis is based on more than 200 bibliographical references, i.e. books, relevant scientific articles in the field of finance, sustainability and quantitative modelling, regulations and laws, sustainability reports and specialised websites.

Main results and general conclusions

Sustainability is a central theme for society as a whole, which is increasingly concerned with meeting the needs of the present without compromising the ability of future generations to meet their own needs. To meet this challenge, international organisations, particularly in Europe, have prepared concrete legislative measures to redirect financial resources towards sustainable projects and companies. Thus, the popularity of the ESG concept has grown significantly in recent years due to the ability of ESG ratings to provide a quantifiable measure of a company's sustainability performance.

In this context, the aim of this paper was to determine the influence of ESG on the economic and financial performance of companies, an influence that is still unclear and subject to debate. The results of the research carried out in this thesis led to findings relevant to fund managers, financial managers, regulators, researchers and financial and sustainability professionals. The thesis approaches this aim from a multidimensional perspective: global, sectoral, regional and in a context of uncertainty marked by the Russian-Ukrainian war.

Firstly, non-financial reporting, using the most relevant industry standards, is on the rise in Romania, encouraged by ambitious European regulations. Content analysis of the sustainability reports of 23 companies reveals an increase in the level of non-financial environmental disclosure between 2021-2022, from 30% to 44% on average for the companies analysed. At the same time, as a result of the increased availability of non-financial information for listed companies, ESG scores, measures of sustainability performance, have started to be calculated for them. Over the period 2022-2023, an increase in this performance was observed, i.e. an average decrease in the ESG risk score and an increase in the management score, year-on-year, for most of the sectors analysed. The real estate and energy and utilities sectors stand out with major year-on-year changes, explained by increased exposure to material ESG issues, especially related to the environment, but with different approaches to managing these risks at sector level. In contrast, no significant correlation between non-financial disclosure, ESG and financial performance is observed at the level of the main listed companies. A significant positive correlation is found between ESG performance as measured by exposure and management scores and market capitalisation, which confirms the findings of some studies that there might be a link between ESG scores and firm size. At the regional level, no significant link can be confirmed between companies' sustainability and financial performance.

The same conclusion can be drawn for the automotive sector, a sector where a research gap has been identified. The results of this thesis show mixed influences of ESG scores on firm value from 2015 to 2020. Specifically, in terms of the influence of environmental score on firm value, using structural equation modelling, a significant positive influence is found only from 2015 to 2016, while the other cross effects are not significant.

For the governance score, mixed effects on firm value are observed, notably a negative effect from 2016 to 2017 and 2019 to 2020 respectively, and a positive effect on firm value from 2017 to 2018 and 2018 to 2019. Therefore, the hypothesis of a positive, significant relationship over the period 2015-2020 is rejected. The original hypothesis for the social score was also invalidated. When it comes to the influence of the overall ESG score on firm value, the results also show mixed effects in the first three years and insignificant influence in the following two years. Compared to the study by Behl et al. (2021), which follows a similar methodology for companies in the energy sector and whose results support some of the hypotheses, the results of this study do not support any of the hypotheses originally established.

At the global level, however, in an extensive survey of over 2000 companies over a 5-year period (2018-2022), using both cluster analysis and regression analysis with panel data, a significant negative relationship was identified between ESG risk and certain indicators of company financial performance. Specifically, companies with high ESG risks and high exposure to these risks tend to have poor financial performance, especially when this performance is measured by market indicators.

Through cluster analysis with hierarchical methods and partitioning algorithms, homogeneous groups of companies characterized by similar financial and ESG risk profiles were identified. This clustering allowed the discovery of trends in these clusters, revealing intrinsic connections between financial and non-financial characteristics of companies. An optimal two-cluster solution was obtained, with companies clustering either in a cluster of outperforming companies or in a cluster of underperforming companies, confirming the initial hypothesis set based on existing literature. Complementing the cluster analysis, regression models with panel data provided empirical evidence on the relationship between ESG risk and financial performance at both the total sample and cluster levels. The results of these models indicated a weak but significant negative correlation between ESG risk and exposure and financial performance, as measured by return on assets and Tobin's Q, at both the total sample and cluster levels. Specifically, companies with high ESG risk and high ESG risk exposure tend to have poor financial performance. Interestingly, a weak but significant negative correlation was found between management score and Tobin's Q for companies underperforming in terms of ESG risk and financial performance. Specifically, companies that are underperforming from a combined ESG and financial perspective, but have relatively good ESG risk management, tend to have a lower market value relative to their size. This could be due to investors' perception that managing ESG risks implies an additional cost for the company, which should be considered in the valuation of a company. Finally, no significant correlation was found between ESG risk, exposure and management and return on equity. This reaffirms the importance of ESG factors in generating long-term value for companies and their stakeholders. By encouraging environmental, social and good governance practices, companies can mitigate risks that have been empirically shown to

have a negative impact in the long term. At the same time, the importance of integrating ESG into business strategies was highlighted, recognising the heterogeneity of companies' ESG risk profiles and the contextual factors that shape them. Companies need to align their ESG initiatives with their business models, industry dynamics and stakeholder expectations to achieve tangible long-term financial benefits. Last but not least, current research highlights the need to continuously monitor, evaluate and adapt ESG practices to respond to rapidly evolving regulations, market dynamics and societal expectations. Companies that take a proactive approach to ESG integration are better positioned to mitigate risks and be more resilient in the face of uncertainty.

In the context of the Russian-Ukrainian war, no significant effects of continued or interrupted economic activity in Russia on companies' ESG scores were found. This is explained by the difficulty of quantifying the effects of the war within current ESG rating methodologies. From the perspective of the theoretical implications of this study, in the context of a growing regulatory framework for ESG rating agencies, this thesis provides empirical evidence that withdrawal or continuation of activity in an invading country does not affect ESG ratings. This can be helpful to both regulators and ESG rating agencies in an effort to improve the research and methodology behind these ratings. From the perspective of managerial implications, the materiality of the war over ESG ratings is still unclear. Investors still rely on financial information, even though they have recently started to include ESG ratings in their investment decisions, and awareness of these issues has increased considerably in recent years. From an ethical investor's perspective, although difficult to quantify under current ESG rating methodologies, doing business in an invading country certainly has negative consequences for a company's reputation and credibility.

Therefore, the research in this thesis leads to the conclusion that, from a risk management perspective, there is a potential long-term negative influence of ESG risk on companies' financial performance. Although the results at the global level confirm this link, it is not confirmed at the regional and sectoral level, suggesting the need for further study. At the same time, given that sustainability is a long-term and very long-term concern, this phenomenon needs to be studied over a longer period of time. Finally, the thesis highlights the need for standardisation and increasing the quality of ESG and non-financial data through a more coherent, effective and comprehensive regulatory framework, rigorous external audit and active stakeholder engagement.

Original contributions and results dissemination

The most significant contribution of this thesis is the complex quantitative approaches to the relationship between sustainability performance, as measured by ESG ratings, and financial performance in a multidimensional context. This approach has allowed an in-depth investigation of the relationship in question, leading to relevant results and the formulation of concrete and as comprehensive conclusions as possible. The whole work respects the criterion of originality, and a critical and comprehensive approach to the issue is found from the very first chapters.

The first chapter provides an original synthesis of the most important aspects of the history and evolution of the ESG concept, so that the context of the research is as relevant and well documented as possible. A similar synthesis is also made in the second chapter, which includes, however, the author's original assessment of the main limitations of non-financial reporters as a basis for ESG ratings. It also argues for potential solutions from a critical perspective and emphasises the need for standardisation and increasing the quality of non-financial data.

The third chapter represents the first research in the paper and is also the first in Romania to use ESG risk, exposure and management scores instead of traditional E, S and G scores to measure ESG performance, and to study the correlation with non-financial disclosure and financial performance.

The fourth chapter is a broad, global study, which stands out for the novelty of its approach in the context of the topic under analysis, i.e. it proposes a combined methodology: cluster and panel analysis to explore the relationship between ESG and financial performance, both at the cluster and total sample level.

The fifth chapter explores this relationship at the level of the automotive sector, where a research gap has been identified. This study is based on a new, complex modelling methodology using structural equations, which is the main novelty.

The last chapter is an original research that stands out by using a diverse dataset, with ESG, financial, but especially economic activity data of companies in the Russian Federation from the Yale School of Management and Kyiv School of Economics. These helped to formulate relevant conclusions and explore research hypotheses from multiple perspectives.

Dissemination of research results was achieved through participation in international conferences and publication of scientific articles in international databases and Web of Science listed journals.

Future research directions

The research topic in this thesis is a very popular one in the field of finance, but it is also very dynamic and subject to frequent changes, especially in terms of regulations in this field. This affects the medium-term relevance of the findings and results obtained, which implies the formulation of new research directions as opportunities to improve knowledge in this field.

Specifically, the results from this thesis can be considered as starting points for future research, and some ideas are as follows:

- Extend the analysis of non-financial disclosure to listed companies in Central and Eastern European countries for regional and multi-year comparison; given the number of companies in the sample, the methodology can be improved by applying panel data regression, time series modelling or structural equation modelling.
- The same analysis can be carried out taking into account the new ESRS standards which can be used as a benchmark instead of GRI standards.
- It is recommended to use a larger sample, over a longer period of time and with data from multiple ESG data providers in the analysis of the relationship between ESG ratings and financial performance; the methodology can be similar to that used in the fourth chapter of this thesis or a structural equation approach can be used.
- The cross-lagged panel structural equation modelling used in the fifth chapter can be improved by using a Random Intercept - Cross-Lagged Panel Model; the analysis can also be extended to all sectors, not just automotive, or to other sectors where empirical results are limited.
- It is recommended to analyse the influence of continued or discontinued activity in the Russian Federation on ESG ratings using data from several such agencies providing such data.

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