THE CORRELATION BETWEEN FINANCIAL AND NON-FINANCIAL PERFORMANCE REFERRED TO A SAMPLE OF BANKS LISTED ON EUROPEAN STOCK EXCHANGES

Roberta Provasi *, Paola Saracino **

* *Corresponding author,* Department of Business and Law, University of Milan-Bicocca, Milan, Italy
Contact details: Department of Business and Law, University of Milan-Bicocca, Via Bicocca degli Arcimboldi 8, 20126 Milan, Italy
** University of Milan-Bicocca, Milan, Italy

Abstract

In recent decades, corporate social responsibility (CSR) has become increasingly important in the economic and financial context, attracting increasing interest from companies, investors and society. Adopting sustainable practices, which consider environmental, social, and governance (ESG) issues, has become a priority for all organisations that recognise the importance of integrating non-financial aspects into their business model and strategy. This study examines the impact of non-financial performance, represented by ESG, on economic and financial performance in the European banking sector, which was one of the first to introduce CSR. There are several similar studies in the literature, but they are mainly limited to examining the relationship between a single ESG dimension and the financial and economic performance of companies. This study aims to expand the variables of the analysis. To this end, the study investigates the relationship between non-financial information, represented by the environment, human capital, business model and innovation, and financial information identified by the market price of shares, return on assets (ROA), return on equity (ROE), price/earnings (P/E) and book value per share (BVPS). The proposed analysis refers to a sample of companies listed on stock exchanges in the European Union (EU), for which the impact of ESG factors on financial performance is studied using a logit regression model.

Keywords: Corporate Social Performance, ESG, Corporate Financial Performance, Banking System

Authors' individual contribution: Conceptualization — R.P. and P.S.; Methodology — R.P. and P.S.; Investigation — R.P. and P.S.; Resources — R.P. and P.S.; Writing — Original Draft — R.P. and P.S.; Writing — Review & Editing — R.P. and P.S.; Supervision — R.P. and P.S.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

In recent years, the topic of corporate social responsibility (CSR) has spread throughout industrialised countries, opening a new debate on the relationship between ethics and economics. In this renewed context, companies have adopted a new business model that is sustainable to the three ESG dimensions to obtain a "competitive advantage" over their competitors by reducing

environmental impacts and maximising corporate value. This approach, which can be traced back to the paradigm of "corporate social responsibility (CSR)", as it is called, is not new, but dates back to the beginning of the century, although it was not until 1953 that the American economist Howard Rothmann Bowen formulated the first definition (Bowen, 2013). Subsequently, since the 1970s, research aimed at studying this phenomenon has intensified. There are many types of studies in the literature that, in addition to defining the topic (Friedman, 1970; Wood, 1991), develop new theories focused on management models suitable for better protecting the social and environmental aspects of companies (Elkington, 1997; Carroll, 2016). With the new century, the European Community launched a series of programs, including the Green Paper (European Commission, 2001), to support a sustainable economy, respectful of human rights, working principles, environmental protection and the fight against corruption. Another significant step was the publication of the ISO 26000 standard on social responsibility[1] to fill the existing regulatory gap. This standard provided a practical guide to companies interested in developing and implementing responsible practices, considering their operations' social, environmental and economic dimensions (International Organization for Standardization [ISO], 2010). Finally, in 2014, the European Parliament approved the European Union (EU) Directive on Non-Financial Reporting (2014/95/EU)[2], which lays the foundations for non-financial reporting. And in 2015, the United Nations approved the 2030 Agenda for Sustainable Development[3], which defines the 17 objectives (Sustainable Development Goals, SDGs), that member countries must seek to achieve by 2030. With the adoption of the new Directive, attention is increasingly focused on objective and transparent reporting on environmental, social, and economic (ESG) aspects. Therefore, defining shared standards that guarantee homogeneous rules for disclosing non-financial information becomes essential. In this context, the recent approval and publication of Directive (EU) 2022/2464 on the Corporate Sustainability Reporting Directive (CSRD)[4] fits in, which equates the relevance of ESG results with those reported in traditional financial statements.

To complete the new provisions, the EU has commissioned the European Financial Reporting Advisory Group (EFRAG) to develop a draft European Standard Reporting Sustainability (ESRS)[5] defining the detailed disclosure requirements of the CSRD. The public consultation of the standards closed in July 2023, and the first set of 12 standards entered into force on January 1, 2024.

The implementation of CSR and the provision of non-financial information has become increasingly important in the banking sector. For banks, sustainability is not only an ethical issue, but is also becoming an economic and existential issue, generating a new type of risk: ESG risk. ESG risks can damage a bank's business, financial position, earnings or reputation. It is, therefore,

essential to incorporate these risks into the risk management framework, a process that requires adjusting risk strategies and corresponding risk appetite statements. ESG risk impacts financial and non-financial risks in a bank differently. As a result, risk management methods must be modified to consider the complex cause-effect relationships between various types of risk. Finally, regulators, rating agencies and other entities have imposed increased requirements to meet reporting needs. This constant flow of new regulations creates new responsibilities and compliance rules for banks.

Based on these considerations, this study aims to contribute to filling the gap in research on the relationship between non-financial indicators and the financial performance of European-listed companies in the banking sector. In particular, the object of the research is an expanded analysis of the non-financial and financial variables to better highlight those that contribute most to determining significant effects in the relationship between non-financial and financial performance.

The remainder of this paper is organised as follows. Section 2 presents the literature review and the hypothesis development. Section 3 describes the research method used to collect and analyse the data. Section 4 explains the results of the empirical study, and finally, Section 5 provides the conclusions, limitations and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

There are many studies examining investor behavior regarding ESG. Most agree that the importance of companies' ESG performance is currently growing as investors increasingly focus on "socially responsible investing" (Alsayegh et al., 2020).

Therefore, investors must obtain adequate, consistent and measurable ESG data from companies, enabling them to make correct and informed decisions when investing.

However, not all stakeholders value the ESG approaches taken by companies. In some cases, corporate executives seek short-term profits rather than increasing long-term shareholder value (Dorfleitner et al., 2020).

Most studies in the past have focused on a single dimension of ESG (Ponnu, 2008; Barnett & Salomon, 2012), but ESG issues are interconnected; therefore, focusing on a single dimension can be problematic (Galbreath, 2013).

The relationship between ESG and corporate financial performance has been examined in numerous studies (Chang & Kuo, 2008), which have demonstrated the existence of significantly positive, negative, as well as insignificant and neutral relationships, many of which are due to the different empirical methodologies used. Recent studies have questioned previous studies on ESG and financial performance relationships due to several conceptual and methodological problems, such as the other measures, reference period, and different control/ mediator/moderator variables considered (Wang et al., 2015; Zhao & Murrell, 2016). Of relevance to this study is the study by Buallay (2018), which observed 235 European banks between 2007 and 2016 and found that collective ESG scores had a positive impact on financial performance (return

---

[1] https://www.iso.org/iso-26000-social-responsibility.html
[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0095
[3] https://www.un.org/sustainabledevelopment/
[4] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022L2464
[5] https://www.unepfi.org/impact/interoperability/european-sustainability-reporting-standards-esrs/

on assets — ROA and return on equity — ROE) and market performance. However, when considering the ESG scores separately, the results were different. Environmental scores had an overall positive effect, social scores had an overall negative impact, and governance scores hurt ROE and ROA.

Another study (Shakil et al., 2019) investigated 93 emerging market banks from 2015–2018. Environmental and social scores had a positive impact on ROA and ROE, while governance scores had a negligible impact. The explanation is that banks in emerging markets may practice inadequate governance measures and thus would not contribute effectively to financial performance.

Another contribution (Ramić, 2019) examined the relationship between ESG performance and the financial performance of selected companies worldwide and found that ESG performance has a significantly positive impact on company profitability. Another study by Landi and Sciarelli (2019) analyzed the relationship between ESG performance and market performance of European listed companies. They did not find a positive and significant impact of ESG performance on the market performance of companies in Italy. There are limited studies on the relationship between ESG and financial performance in the banking industry. However, some research (Shen et al., 2016) found that banks with the highest levels of CSR achieved better financial performance when management considered CSR policies strategically.

As regards non-financial information, the research has identified the following dimensions:

1) *Environment:* The dimension considers the impact of a company's activities on the environment and the long-term sustainability of natural resources. Environment can include issues such as greenhouse gas emissions, waste management, and the conservation of natural habitats. Investors also have a role in promoting ESG environmental practices through their investment decisions and shareholder engagement. As the importance of ESG continues to grow, more companies and investors will likely prioritise the environmental dimension of ESG to drive positive change and promote a more sustainable and responsible business environment. Some studies (Esteban-Sanchez et al., 2017) did not analyse the environmental dimension because banking is not considered particularly polluting. Although banks can indirectly influence the environment through their project financing decisions, the data provided by banks is still scarce, even if they have adopted the Equator Principles (EPs)[6] of CSR. Some researchers (Scholtens & Dam, 2007) did not observe any positive financial impacts among banks that have adopted the EPs.

2) *Human capital:* The dimension concerns how the company manages and enhances its human capital, i.e., the skills, knowledge and abilities of its employees. It includes diversity and inclusion, staff training and development, and employee well-being. Most studies have found a positive impact of employee relations on financial performance (Zhang, 2010). The literature shows that good employee policies generate competitive advantages in terms of increased efficiency, productivity and turnover, by reducing staff rotation, absenteeism and stress, and by improving employee commitment. Deniz-Deniz and De Saa-Perez (2003) find that savings banks with institutionalised high-commitment practices towards employees have greater profitability. Such corporate social responsiveness promotes employee collaboration and could distinguish the company from other organisations. Furthermore, Soana (2011) found a positive correlation between employees and the cost-to-income ratio, market-to-book value, and price-to-book value in a sample of Italian banks.

3) *Business model and innovation:* The dimension analyses how the company manages sustainability and innovation in its business model. It includes the ability to adapt to market changes and challenges, the search for innovative solutions to social and environmental problems, and the company's overall approach to creating sustainable value in the long term. Innovation is a tool that most companies use to initiate their sustainable change path by addressing issues of profit management, CSR, accountability, and transparency (Lombardi & Secundo, 2020) by adopting innovations that consider the three dimensions of ESG. The innovation capacity of firms can be measured through research and development (R&D) expenditures or technological output, such as patents or patent applications (Broadstock et al., 2020). Previous literature has examined the relationship between innovation and sustainability performance, although it shows mixed results (Ahmad & Wu, 2021). Some studies have found a positive relationship between innovation and sustainability performance (Du & Li, 2019), while other studies have found a negative association (Marsat & Williams, 2014).

4) *Leadership and governance:* The dimension focuses on the company's leadership practices and governance structure. It includes transparency and accountability of management decisions, board independence, effectiveness of control mechanisms, and management of conflicts of interest. In the literature, many studies investigate the impact of governance on financial performance. The same stakeholder theory (Freeman et al., 1984) establishes a link between corporate governance and financial performance. Hill and Jones (1992) advocate stakeholder-agency theory, which states that responsible governance implies maintaining better relationships and reducing agency problems with stakeholders. From a practical perspective, corporate governance is considered one of the most important dimensions of corporate social performance in most aggregated indicators constructed by ESG rating agencies (Miras-Rodríguez et al., 2015).

As regards financial information, the research has identified the following dimensions:

• *Price:* The current market value of a share traded on a stock exchange depends on supply and demand. The market price used for the study is the average closing price over a set date range, i.e., from January 2022 to December 2022. The objective of the study is to understand whether ESG variables affect the stock price over a one-year period.

• *Return on equity* (*ROE*): The ratio verifies the rate of remuneration of risk capital. It's a financial index on the profitability of equity capital, obtained by dividing the net profit by equity. The ratio can be considered a summary of overall economic performance, assessing how management has managed equity capital to increase the company's profits.

---

[6] https://equator-principles.com/

• *Return on assets* (*ROA*): The ratio measures how effectively a company uses its assets to generate profit. It shows how efficient management is at using its assets to create earnings. The higher the ROA, the more efficient a company is at converting its assets into profits.

• *Price/earnings* (*P/E*): It is the most widely used multiple to measure the valuation of a share or an entire listed company. It is the ratio of a company's share price (market price) to earnings per share. The market price per share represents the current market value on the stock market, while earnings per share indicate the net income generated by the company divided by the number of common shares outstanding.

• *Book value per share* (*BVPS*): A financial indicator that represents the equity value of a company divided by the number of shares in circulation. It is a measure of equity expressed in monetary terms concerning each share. It is helpful for investors and financial analysts because it indicates the book value of each share.

Thus, within the framework of this study, the following hypotheses were formulated:

H_0: There is no relationship between the variables under study.

H1: There is a positive correlation between ESG variables and the market price of the share.

H2: There is a positive correlation between ESG variables and the return on asset index.

H3: There is a positive correlation between ESG variables and the return on equity index.

H4: There is a positive correlation between ESG variables and the price/earnings index.

H5: There is a positive correlation between ESG variables and the book value per share index.

According to H_0, one variable does not influence the other, for a p-value of 0.1.

The p-value is the probability of obtaining a specific result if H_0 is true, i.e., what we assert is correct with a small margin of error. The p-value is used in hypothesis testing to assess the significance of the test result concerning H_0 and helps determine whether to accept or reject H_0. In the study:

• if $p \geq 0.1$, H_0 will be accepted, stating that there is no relationship between the variables;

• if $p \leq 0.1$, H_0 will be rejected, and the alternative hypothesis formulated will be accepted.

In summary, the p-value helps to assess the probability that H_0 is true. If this probability is low enough ($p < 0.1$), one can conclude that there is a significant relationship between the variables and accept the alternative hypothesis. Conversely, if the probability is high ($p > 0.1$), there is not enough evidence to reject H_0 and conclude that there is no relationship between the variables.

3. RESEARCH METHODOLOGY

3.1. Structure of the European Union listed banks sample

This study aims to measure the impact of ESG variables on the financial performance of EU banks listed on different stock markets. The FactSet database was used to define the sample, starting from the Truvalue SASB ESG Screen section containing ESG indicators calculated by Truvalue Labs, which extracts, analyses and generates scores from millions of documents (FactSet, n.d.-a).

FactSet is a financial data and analytics platform that provides comprehensive information on global financial markets, including stock prices, company financials, economic data, and industry reports. FactSet integrates data from various sources, offering powerful tools for data visualization and modelling. It also offers specialized ESG data, helping users evaluate companies based on sustainability and ethical factors. With integrated ESG metrics, FactSet enables users to analyse companies' environmental impact, social responsibility, and governance practices alongside traditional financial data, supporting responsible investment and compliance with sustainability mandates (FactSet, n.d.-b).

Within the database, criteria were set to identify only companies falling within the area of interest, i.e., the macro-area "Finance", and which categories were: major banks, regional banks, savings banks, finance/retail/leasing, investment banks, investment managers, financial conglomerates, property insurance, multi-line insurance, life/health insurance, speciality insurance, and insurance brokers/services. For the "Geography" section, the "European Union" filter was set to narrow the search field. In addition, to ensure completeness, it was decided to also include financial sector companies listed on the London Stock Exchange (LSE) in the sample, given the important role of the LSE and the significant weight of these companies in the total volume (around 29% of financial institutions are listed on the LSE). The data obtained from FactSet were processed by selecting companies that provided values for all ESG variables, excluding those with missing data from the sample. This choice was made due to the difficulty of finding such information in other publicly available databases. Instead, without financial data, the ORBIS database was used to complete the values necessary for the analysis.

The ORBIS database, managed by Bureau van Dijk, is a comprehensive global platform that provides detailed financial, ownership, and corporate information on over 400 million public and private companies worldwide. It offers in-depth data on financial statements, corporate structures, mergers and acquisitions, and beneficial ownership, making it essential for research, due diligence, compliance, and risk management. ORBIS also includes advanced tools for financial analysis, company comparison, and market research (https://www.moodys.com/web/en/us/capabilities/company-reference-data/orbis.html).

In conclusion, the final sample used in carrying out the empirical analysis is equal to 101 companies. As for the base period, given the impossibility of tracking historical ESG data in the FactSet database, it was decided to use a twelve-month lag. The ESG independent variables refer to the 2021 financial year, while the economic and financial indicators are calculated based on the results of the 2022 financial year. This approach allows us to understand the impact of companies' ESG policies on their financial results. The sample included only companies listed on regulated markets to simplify the data collection process and ensure greater completeness and reliability of the information, given that listed companies are required to make their financial and operational data public. In addition, listed companies are subject to higher levels of control and supervision by regulators and investors, which contributes to greater transparency and reliability of the data.

Figure 1 shows the distribution of companies included in the sample.

Figure 1. Distribution of sample companies in European stock exchanges

- London Stock Exchange (29)
- Milan Stock Exchange (13)
- Euronext Paris (10)
- Frankfurt Stock Exchange (8)
- Madrid Stock Exchange (7)
- Stockholm Stock Exchange (6)
- Warsaw Stock Exchange (6)
- Euronext Amsterdam (5)
- Athens Stock Exchange (4)
- Copenhagen Stock Exchange (3)
- Euronext Dublin (2)
- Vienna Stock Exchange (2)
- Bucharest Stock Exchange (2)
- Prague Stock Exchange (2)
- Euronext Lisbon (1)
- Euronext Brussels (1)

Source: Authors' elaboration

3.2. No financial data

Table 1 shows the average, minimum and maximum of the "Momentum Score All" categories, a score that measures the trend of a company's "Insight" indicator over 12 months with values from 0 to 100.

The data are organised according to the stock market. In some cases, it was necessary to combine multiple stock markets due to the limited presence of listed companies in the sample to have a more prominent and representative data set for the analysis.

Table 1. Average, minimum and maximum ESG values for European stock exchanges

Stock exchanges	Median	Min	Max
London Stock Exchange (LSE)–Irish Stock Exchange (Euronext Dublin)	69.13	22.63	89.73
Euronext Paris	54.77	19.17	76.57
Frankfurt Stock Exchange–Vienna Stock Exchange–Euronext Brussels	57.8	20.93	85.40
Euronext Amsterdam	72.53	66.13	78.34
Milan Stock Exchange (Borsa Italiana)	75.20	46.99	86.01
Madrid Stock Exchange–Euronext Lisbon	67.74	23.58	83.76
Stockholm Stock Exchange–Copenhagen Stock Exchange	59.55	21.18	83.69
Warsaw Stock Exchange–Athens Exchange–Bucharest Stock Exchange–Prague Stock Exchange	59.51	11.38	86.16

For the LSE, combined with the Irish Stock Exchange (Euronext Dublin), due to the presence of only two companies, the average value is 69.13. Interestingly, Allied Irish Banks (AIB) Group Plc, one of Ireland's leading commercial banks, achieved the maximum score of 89.73, indicating a particularly positive ESG performance. In contrast, Admiral Group Plc, a UK-based financial services company, recorded the lowest score of 22.63, indicating relatively weaker ESG performance. Importantly, the average score of 69.13 indicates an overall satisfactory result in the context of ESG analysis of companies listed on the LSE and Dublin Stock Exchanges. Euronext Paris has an ESG average of 54.77, an insufficient score and the worst compared to all other stock exchanges, with a maximum value of 76.57 for Amundi S.A. and a minimum of 19.17

for Société Generale S.A. The relatively low average suggests that companies listed on this exchange may have margins for improvement in adopting more sustainable and responsible practices. However, it is necessary to carefully analyse the specific factors that influence each company's ESG score in order to obtain a full assessment of their sustainable performance.

For the analysis of companies listed on the Vienna Stock Exchange (Wiener Börse) and Brussels Stock Exchange (Euronext Brussels), it was decided to combine them with companies on the Frankfurt Stock Exchange (Börse Frankfurt), as there were only two and one company, respectively, making it impossible to obtain meaningful averages for such a limited number of companies. Again, similar to France, the average ESG score was

insufficient, with a value of 57.80. The lowest score, equal to 20.93, belongs to the Austrian company Raiffeisen Bank International AG, while the German company Grenke AG obtained the highest score, equal to 85.40.

For companies listed on Euronext Amsterdam, an average ESG score of 72.53 was obtained, which can be considered quite good considering the passing value of 60. Among the companies analysed, the worst was Aegon N.V. with a score of 66.13, while the best was NN Group — 78.34. NN Group is one of the leading insurance companies in the Netherlands and has a significant presence in other international markets. The company is committed to offering its customers sustainable and long-term financial solutions, focusing on innovation and digitalisation.

Financial companies on the Milan Stock Exchange (Borsa Italiana) have the highest average within the sample. The average is 75.20, slightly higher than the average of the Euronext Amsterdam. The best company among those selected is Banco BPM S.p.A., with a score of 86.01, while the worst is FinecoBank S.p.A., with 46.99.

The analysis of companies listed on the Madrid Stock Exchange was carried out together with the LSE (Euronext Lisbon) due to the presence of only one company. An average ESG score of 67.74 is observed. The company with the lowest score is Banco Commercial Portugues S.A., with a score of 23.58, while the company with the highest score is Mapfre S.A., with a score of 83.76.

The average score for the Stockholm (Nasdaq Stockholm) and Copenhagen (Nasdaq Copenhagen) stock exchanges is 59.55, which is almost a passing grade. The company with the worst ESG rating is Jyske Bank A/S, with 21.18. At the same time, the best is Investor AB Class B, a Swedish investment company with a long history and solid reputation in the financial sector, with a score of 83.69.

Finally, to have sufficient companies to calculate the average and carry out the analysis, the Warsaw Stock Exchange, Athens Stock Exchange (Athens Exchange), Bucharest Stock Exchange and Prague Stock Exchange were combined. The average is 59.51, again almost sufficient, with a minimum of 11.38 for the Polish company Alior Bank S.A. and a maximum of 86.16 for the National Bank of Greece S.A.

3.3. Financial data

For the analysis of financial performance, Table 2 reports the average, maximum and minimum of the financial data of the companies in the sample divided by the stock exchange.

Table 2. Average, maximum and minimum values of financial metrics of the European stock exchanges

Indicator	Median	Max	Min	Median	Max	Min
	LSE-Euronext Dublin			*Euronext Paris*		
Price	10.93	89.23	0.54	32.27	67.97	10.17
ROE	10.93	83.52	-57.33	8.77	17.02	-6.01
ROA	5.22	29.96	-0.84	1.11	4.54	-2.82
P/E	12.44	110.72	-73.42	-14.94	16.85	-203.00
BVPS	6.84	57.66	0.41	40.33	92.03	2.71
	Frankfurt Stock Exchange–Vienna Stock Exchange			*Euronext Amsterdam*		
Price	65.36	195.05	7.39	28.18	73.22	4.61
ROE	12.50	22.22	5.74	2.87	9.24	-16.89
ROA	1.61	5.01	0.30	1.03	4.14	-0.63
P/E	9.65	19.83	1.43	8.04	11.28	5.44
BVPS	46.05	116.12	22	26.48	56.88	5.82
	Milan Stock Exchange			*Madrid Stock Exchange–Euronext Lisbon*		
Price	10.54	30.89	1.71	2.62	5.50	0.15
ROE	12.37	24.81	5.86	8.56	13.73	3.98
ROA	0.79	1.32	0.37	0.55	1.08	0.23
P/E	10.15	22.09	1.87	8.74	12.96	5.20
BVPS	10.15	30.24	1.97	3.71	7.05	0.31
	Nasdaq Stockholm–Nasdaq Copenhagen			*Warsaw, Athens, Bucharest, & Prague stock exchanges*		
Price	21.54	52.05	9.23	16.69	64.36	0.98
ROE	3.57	14.03	-36.14	10.64	22.93	-17.62
ROA	-4.44	1.05	-33.81	0.94	1.78	-0.95
P/E	2.99	11.10	-23.34	7.18	50.52	-17.87
BVPS	24.69	78.10	8.42	14.91	64	0.97

In terms of *Price*, the higher the price, the stronger the financial position of the company. The stock exchange with the highest average value is the Frankfurt Stock Exchange (along with the Vienna Stock Exchange) with a value of 65.36 This average value is much higher than in other countries, and this is due to the presence of important financial companies with high prices compared to the rest of the sample. In particular, companies such as Allianz SE (with a price of 195.05), Deutsche Boerse AG (162.40), and Hannover Rueck SE (156.52) contributed to the increase in the average closing price of shares on the Frankfurt Stock Exchange. Among these companies, Allianz SE, one of the world's largest insurance and financial companies, stands out with the highest price among all the companies selected. The Frankfurt Stock Exchange also stands out for its *ROE* value, with an average of 12.50. Comparing this indicator between companies listed on different stock exchanges can provide interesting information. Still, it is essential to consider each company's differences, specific peculiarities, and the market in which they operate to obtain an accurate and meaningful analysis. The highest *ROE* in the sample, equal to 83.52, belongs to the English company PayPoint Plc, listed on the LSE. This value suggests a good return on invested capital.

The results show that the highest average (median) score for *ROA* is that of the LSE with

a value of 5.22. Instead, the maximum score belongs to PayPoint Plc, which has a score of 29.96. As regards the *P/E* ratio, the best average result associated with this ratio is given by the LSE, which in our analysis, combined with the Dublin Stock Exchange, is 12.44.

Hiscox Ltd, with a *P/E* of 110.72 (on the LSE), indicates that the market values this company at a much higher level than the market average. Finally, regarding the *BVPS*, the highest average score is found on the Frankfurt Stock Exchange, with an average value of 46.05.

3.4. Methodology research

In the following, we summarise the descriptive statistics for independent and dependent variables used in the logit regression model. The different components of the ESG score were set as independent variables. Since an ESG score is a multidimensional index built on the results of ESG information, and the impact of one dimension can sometimes neutralize the opposite effects of another dimension, several separate ESG scores were considered to better assess which dimension of the ESG score influences financial performance.

The independent variables *X* used in the model, with scores between 0 and 100, are as follows (described in Section 2): 1) environment, 2) human capital, 3) business model and innovation, and 4) leadership and governance.

The dependent variables *Y* (bank performance) are presented in Table 2.

Referring to other similar studies found in the literature (Andersen & Dejoy, 2011), it was also decided to identify some control variables presented in Table 3.

Table 3. Control variables

Variable	Description
Size	Company size is measured by the *ln(Total Assets)*. Company size is a crucial control variable to consider because the larger the company, the more evident the scale effects will be and the more sensitive the firm will be to improving its financial performance through corporate governance and other means. Therefore, for companies of significantly different sizes, their way of managing ESG performance and financial results may be substantially different.
Leverage	Financial leverage reflects the extent to which a company uses debt financing instruments, and it is measured by the ratio of its average annual total liabilities to its average annual total assets. For companies using different financial leverage, their business strategies and risk preferences will differ, so their ESG performance management style may also differ. For this reason, we also consider it one of the control variables.
Beta	*Beta = Cov(R_i, R_m) / Var(R_m)*, a coefficient that defines the measure of the systematic risk of a financial asset or the tendency of the asset's return to change as a result of market fluctuations. The *Beta* indicator expresses the volatility, and, therefore, the risk, of a security in the market. A *Beta* higher than 1 indicates that the security has greater fluctuations than the market over time, while a security with a *Beta* below 1 means that the security's volatility is lower than that of the market. Generally, companies with aggressive business policies or high levels of indebtedness have the highest beta values. In contrast, companies operating in traditional economic sectors have shares with lower beta.

Therefore, the analysis is based on defining specific regression models for each financial index, including ESG variables as regressors and the control variables *Leverage*, *Size,* and *Beta*. For all financial indices, the models are calculated as follows:

$$Index_{t+1} = \beta Environment_t + \beta Human\ capital_t + \beta Business\ model\ and\ innovation_t + \beta Leadership\ and\ governance_t + \beta Leverage_t + \beta Size_t + \beta Beta_t \tag{1}$$

4. SAMPLE ANALYSIS

4.1. Correlation between Price and ESG

Regarding hypothesis *H1*, which considers the correlation between price and *ESG*: The data presented in Table 4 shows that the values assumed by the coefficients R and R-squared are low. Therefore, there is a low linear relationship between *Price* (dependent variable) and the independent variable *ESG*.

The data reported in Table 5 demonstrate that there is no *ESG* variable with a significance value lower than the p-value; the control variables *Beta*, *Leverage* and *Size* are lower than 0.1, and only the control variables impact the *Price*. Therefore, it can be concluded that for hypothesis *H1*, there is no correlation between *Price* and *ESG* variables.

Table 4. Regression testing of *H1*

Key regression	Value
Multiple R	0.404054735
R-square (R²)	0.163260229
Adjusted R-square	0.100279816
Standard error	30.56762901
Observations	101
Significance F	0.017318901

Table 5. The results for each ESG category related to price

Variable	Coefficient	Standard error	Significance value
Intercept	-44.14060092	48.11772867	0.361334276
Environment	-0.190806681	0.214810999	0.376695873
Human capital	-0.158821919	0.276286159	0.566783693
Business model and innovation	0.330273757	0.449151586	0.463990112
Leadership and governance	0.096429206	0.233145871	0.680119052
Beta	-22.3031493	6.597911236	0.001059763
Leverage	-3.700273261	1.52100627	0.016896263
Size	3.808255898	1.662862173	0.024271393

4.2. Correlation between ROA and ESG

Regarding hypothesis *H2*, which considers the correlation between ROA and ESG: Table 6 reports the R-value of 0.4558, which could indicate the presence of a positive correlation between the variables, which is close to 0.5. Furthermore, the R-squared is 0.2074, which means that the dependent variable ROA is explained for 21% by the independent variables. The p-value set at 0.1 also suggests that the regression model is statistically significant, indicating that at least one of the independent variables is related to the dependent variable.

The significance values in Table 7 make it possible to identify which variable positively impacts ROA. *Human capital* has a significance value of 0.0694, which is lower than the *p*-value of 0.1,

which leads to the confirmation of the truth of hypothesis *H2* for the *Human capital* variable. A possible reason for the positive impact may be due to the presence of professional skills of the staff as a company with highly qualified and competent staff could be able to adopt more efficient and innovative strategies and processes, leading to a better use of company assets and, consequently, to an increase in ROA.

Table 6. Regression testing of *H2*

Key regression	Value
Multiple R	0.455816643
R-square (R²)	0.207768812
Adjusted R-square	0.148138508
Standard error	6.05469257
Observations	101
Significance F	0.002321934

Table 7. The results for each ESG category related to ROA

Variable	Coefficient	Standard error	Significance value
Intercept	31.55172927	9.530933988	0.001326703
Environment	0.009514102	0.042548755	0.823555343
Human capital	0.100553283	0.054725466	0.069342215
Business model and innovation	0.098072333	0.088965839	0.273150031
Leadership and governance	-0.051918666	0.04618044	0.263797663
Beta	-0.444433515	1.306883309	0.734569722
Leverage	-0.05380496	0.301273787	0.858646885
Size	-1.19100443	0.329371939	0.000485826

4.3. Correlation between ROE and ESG

Regarding hypothesis *H3*, which considers the correlation between ROE and ESG*:* From the analysis of the results reported in Table 8, some values indicate that there is no linear relationship between the variables ROE and ESG. The F significance, equal to 0.0309, is lower than the p-value 0.1, indicating a possible relationship between at least one of the independent variables and the dependent variable.

Table 8. Regression testing of *H3*

Key regression	Value
Multiple R	0.386326379
R-square (R²)	0.149248071
Adjusted R-square	0.08521298
Standard error	14.63807181
Observations	101
Significance F	0.03089368

The data in Table 9, despite the low significance value of F, allow us to show that there is no linear relationship between the ROE and ESG variables, since, as can be seen, the values are all higher than the p-value, apart from the control variables *Beta* and *Size* that seem to influence ROE.

As for *Business model and innovation*, its significance value of 0.1206 is slightly higher than the p-value of 0.1. The value indicates that despite its lack of statistical significance, there could still be a possible relationship between this variable and ROE. A possible explanation could be an innovative business model that allows the company to identify new growth opportunities, optimise processes, and reduce operating costs, and finally, it could increase profits and, consequently, ROE.

A p-value slightly higher than 0.1 could be due to the relatively limited sample size or greater variability in the data. Therefore, the possibility that *Business model and innovation* has some impact on ROE cannot be completely ruled out.

In conclusion, regarding hypothesis *H3*, it can be stated that there is no linear relationship between ROE and ESG variables.

Table 9. The results for each ESG category related to ROE

Variable	Coefficient	Standard error	Significance value
Intercept	57.5770094	23.04237491	0.014218264
Environment	-0.096856419	0.102867606	0.318855373
Human capital	0.046188306	0.13230652	0.727802849
Business model and innovation	0.337004892	0.215087443	0.120551492
Leadership and governance	-0.122236693	0.111647717	0.276412947
Beta	-5247592533	3.159574413	0.100110631
Leverage	0.551058833	0.728371801	0.451224316
Size	-2.293603204	0.79630304	0.004931196

4.4. Correlation between P/E and ESG

Regarding hypothesis *H4*, which considers the correlation between P/E and ESG: The R-value presented in Table 10 indicates the presence of a slight positive correlation between the dependent variable and the independent variables. The significance level of F is 0.0675, which is lower than the p-value of 0.1, suggesting a possible relationship between at least one of the independent variables and the P/E.

Table 10. Regression testing of *H4*

Key regression	Value
Multiple R	0.359289145
R-square (R²)	0.12908869
Adjusted R-square	0.063536226
Standard error	26.06287657
Observations	101
Significance F	0.067546686

The data in Table 11 shows that the variable *Business model and innovation* has a significance value of 0.0063, which is lower than the p-value of 0.1. This suggests that the variable significantly impacts the P/E and could be an essential factor in determining the ratio between the share price and earnings per share of companies. The presence of the *Business model and innovation* variable with a significance value lower than the p-value could allow the company to identify new revenue opportunities and diversify its sources of income, with the possibility of increasing revenue and profits, positively influencing the P/E. In addition, through innovation, new processes and technologies could be introduced that improve operational efficiency. Reducing operating costs can increase profits, thus increasing the P/E ratio.

The other ESG variables do not significantly impact the dependent variable P/E. Therefore, the lack of correlation between the dependent and independent variables is verified for these three categories.

In conclusion, it can be stated that the P/E is influenced by the *Business model and innovation*, supporting hypothesis *H4*. However, it is essential to consider that the correlation indicators, multiple R and R-squared, are relatively low and not very expressive, and they can be influenced by other variables that are not considered in the regression model. Therefore, further analysis and research may be helpful to fully understand the relationship between the ESG variables and P/E.

Table 11. The results for each ESG category related to P/E

Variable	Coefficient	Standard error	Significance value
Intercept	53.7970867	41.02661749	0.1929993928
Environment	-0.154212514	0.183154295	0.401958348
Human capital	-0.101823679	0.235569859	0.666564611
Business model and innovation	1.070734256	0.382960103	0.006287188
Leadership and governance	-0.079796962	0.198787156	0.689032492
Beta	-0.360078302	5.625576851	0.949101748
Leverage	-0.134142006	1.296855528	0.917839388
Size	1.800910452	1.417806123	0.207178833

4.5. Correlation between BVPS and ESG

Regarding hypothesis *H5*, which considers the correlation between BVPS and ESG*:* The data reported in Table expresses a low correlation between the dependent variable and the independent variables.

Despite the significance value of F equal to 0.0566, lower than the p-value, observing Table 13, it becomes clear that H_0 cannot be rejected.

Table 12. Regression testing of *H5*

Key regression	Value
Multiple R	0.365775039
R-square (R²)	0.133791379
Adjusted R-square	0.068592881
Standard error	21.97521816
Observations	101
Significance F	0.056596085

Table 13. The results for each ESG category related to BVPS

Variable	Coefficient	Standard error	Significance value
Intercept	-44.46471917	34.59207073	0.201843574
Environment	0.07968962	0.154428679	0.60705914
Human capital	-0.135603494	0.198623472	0.496483215
Business model and innovation	-0.017204888	0.322897274	0.957620831
Leadership and governance	0.133376305	0.167609708	0.428200757
Beta	-10.69653982	4.743270692	0.026472893
Leverage	-0.212526932	1.093458854	0.846316321
Size	2.97802951	1.195439758	0.014505583

Based on the conducted research, hypothesis *H5*, according to which there is a positive correlation between the ESG and BVPS variables, cannot be tested, since the results do not confirm the truth of the hypothesis. Therefore, in this case, the truth of H_0 is confirmed, i.e., the absence of a relationship between variable *Y* and variable *X*.

5. CONCLUSION

The study suggests that the relationships between the analysed non-financial and financial variables do not yield very significant results, except for hypotheses *H2* and *H4*. For these two hypotheses, the data confirm the existence of a positive relationship, which, according to a more detailed analysis, the variable that has the greatest impact is human capital, underlining how the presence of

qualified human resources represents a fundamental aspect of banks' governance policy. In contrast to another study presented in the doctrine (Esteban-Sanchez et al., 2017), which confirms that banks have not received economic benefits from their CSR performance in all dimensions. Good governance and labour performance have a clear positive effect on corporate financial performance. This finding means that shareholders and employees may constitute the most relevant stakeholders in the banking industry.

This study is not without limitations, but it does raise some issues that need to be analysed. In particular, the use of a limited period of 12 months may affect the accuracy of conclusions about the impact of ESG variables on economic and financial indicators in the long term. The choice of such a short period was dictated by the lack of ESG data in the FactSet database used to construct the sample, which did not allow us to consider several years at a time. Data related to a single financial year do not allow us to be confident in the positive impact of non-financial indicators on financial indicators, since the Multiple-R and R-squared indicators are always relatively low and far from 1.

The results show that a significant part of the variation in financial indicators remains unexplained and may depend on many factors. For a better investigation, future studies can consider more control variables and extend the observation period. A more complete approach would allow for obtaining more significant and in-depth results. By analysing the significance values, however, an optimistic judgment can be expressed by accepting the hypotheses *H2* and *H4*, demonstrating the positive impact of ESG variables on ROA and P/E.

In conclusion, despite the limitations encountered in the study, the results emerging from the linear regression demonstrate that attention to innovation and human resources policies can positively impact companies' financial performance. However, it is essential to recognise that this study represents only a starting point and that further research and long-term analysis could further deepen the understanding of the actual impact of ESG variables on company performance, also considering the adoption of Directive (EU) 2022/2464 on the Corporate Sustainability Reporting Directive.

REFERENCES

Ahmad, M., & Wu, Y. (2021). Combined role of green productivity growth, economic globalisation, and eco-innovation in achieving ecological sustainability for OECD economies. *Journal of Environmental Management, 302*(Part A), Article 113980. https://doi.org/10.1016/j.jenvman.2021.113980

Alsayegh, M. F., Rahman, R. A., & Homayoun, S. (2020). Corporate economic, environmental, and social sustainability performance transformation through ESG disclosure. *Sustainability, 12*(9), Article 3910. https://doi.org/10.3390/su12093910

Andersen, M. L., & Dejoy, J. S. (2011). Corporate social and financial performance: The role of size, industry, risk, R&D and advertising expenses as control variables. *Business and Society Review, 116*(2), 237–256. https://doi.org/10.1111/j.1467-8594.2011.00384.x

Barnett, M. L., & Salomon, R. M. (2012). Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. *Strategic Management Journal, 33*(11), 1304–1320. https://doi.org/10.1002/smj.1980

Bowen, H. R. (2013). *Social responsibilities of the businessman* [Monograph]. University of Iowa Faculty Connections. https://doi.org/10.1353/book29080

Broadstock, D. C., Matousek, R., Meyer, M., & Tzeremes, N. G. (2020). Does corporate social responsibility impact firms' innovation capacity? The indirect link between environmental and social governance implementation and innovation performance. *Journal of Business Research, 119*, 99–110. https://doi.org/10.1016/j.jbusres.2019.07.014

Buallay, A. (2018). Is sustainability reporting (ESG) associated with performance? Evidence from the European banking sector. *Management of Environmental Quality, 30*(1), 98–115. https://doi.org/10.1108/MEQ-12-2017-0149

Carroll, A. B. (2016). Carroll's pyramid of CSR: Taking another look. *International Journal of Corporate Social Responsibility, 1*, Article 3. https://doi.org/10.1186/s40991-016-0004-6

Chang, D. S., & Kuo, L. C. R. (2008). The effects of sustainable development on firms' financial performance — An empirical approach. *Sustainable Development, 16*(6), 365–380. https://doi.org/10.1002/sd.351

Davis, K. (1960). Can business afford to ignore social responsibilities? *California Management Review, 2*(3), 70–76. https://doi.org/10.2307/41166246

Deniz-Deniz, M., & De Saa-Perez, P. (2003). A resource-based view of corporate responsiveness toward employees. *Organization Studies, 24*(2), 299–319. https://doi.org/10.1177/0170840603024002347

Dorfleitner, G., Kreuzer, C., & Sparrer, C. (2020). ESG controversies and controversial ESG: About silent saints and small sinners. *Journal of Asset Management, 21,* 393–412. https://doi.org/10.1057/s41260-020-00178-x

Du, K. R., & Li, J. K. (2019). Towards a green world: How do green technology innovations affect total factor carbon productivity. *Energy Policy, 131*, 240–250. https://doi.org/10.1016/j.enpol.2019.04.033

Elkington, J. (1997). *Cannibals with forks: The triple bottom line of the 21st century business.* John Wiley & Sons.

Esteban-Sanchez, P., de la Cuesta-Gonzalez, M., & Paredes-Gazquez, J. D. (2017). Corporate social performance and its relationship with corporate financial performance: International evidence in the banking industry. *Journal of Cleaner Production, 162,* 1102–1110. https://doi.org/10.1016/j.jclepro.2017.06.127

European Commission. (2001). *Promoting a European framework for corporate social responsibility — Green Paper.* Publications Office. https://ec.europa.eu/commission/presscorner/api/files/document/print/en/doc_01_9/DOC_01_9_EN.pdf

FactSet. (n.d.-a). *At a glance: FactSet Truvalue SASB scores datafeed.* https://insight.factset.com/resources/at-a-glance-factset-truvalue-sasb-scores-datafeed

FactSet. (n.d.-b). *Data solutions.* https://www.factset.com/solutions/data-solutions

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

Friedman, M. (2007). The social responsibility of business is to increase its profits. In W. C. Zimmerli, M. Holzinger, & K. Richter (Eds.), *Corporate ethics and corporate governance* (pp. 174–178). Springer. https://doi.org/10.1007/978-3-540-70818-6_14

Galbreath, J. (2013). ESG in focus: the Australian evidence. *Journal of Business Ethics, 118*(3), 529–541. https://doi.org/10.1007/s10551-012-1607-9

Hill, C. W. L., & Jones, T. M. (1992). Stakeholder-agency theory. *Journal of Management Studies, 29*(2), 131–154. https://doi.org/10.1111/j.1467-6486.1992.tb00657.x

International Organization for Standardization (ISO). (2010). *Guidance on social responsibility (ISO Standard No.* 26000:2010). https://www.iso.org/standard/42546.html

Landi, G., & Sciarelli, M. (2019). Towards a more ethical market: The impact of ESG rating on corporate financial performance. *Social Responsibility Journal, 15*(1), 11–27. https://doi.org/10.1108/SRJ-11-2017-0254

Lombardi, R., & Secundo, G. (2020). The digital transformation of corporate reporting — A systematic literature review and avenues for future research. *Meditari Accountancy Research, 29*(5), 1179–1208 https://doi.org/10.1108/MEDAR-04-2020-0870

Marsat, S., & Williams, B. (2014). *Does the market value social pillar?* https://doi.org/10.2139/ssrn.2419387

Miras-Rodríguez, M., Carrasco-Gallego, A., & Escobar-Perez, B. (2015). Has the CSR engagement of electrical companies had an effect on their performance? A closer look at the environment. *Business Strategy and the Environment, 24*(8), 819–835. https://doi.org/10.1002/bse.1848

Ponnu, C. H. (2008). Corporate governance structures and the performance of Malaysian public listed companies. *International Review of Business Research Papers, 4*(2), 217–230.

Ramić, H. (2019). *Relationship between ESG performance and financial performance of companies: An overview of the issue* [Master's thesis]. University of Lausanne. https://doi.org/10.13140/RG.2.2.34837.68322

Scholtens, B., & Dam, L., (2017). Banking on the Equator: Are banks that adopted the equator principles different from non-adopters? *World Development, 35*(8), 1307–1328. https://doi.org/10.1016/j.worlddev.2006.10.013

Shakil, M. H., Mahmood, N., Tasnia, M., & Munim, Z. H. (2019). Do environmental, social and governance performance affect the financial performance of banks? A cross-country study of emerging market banks. *Management of Environmental Quality, 30*(6), 1331–1344. https://doi.org/10.1108/MEQ-08-2018-0155

Shen, C. H., Wu, M. W., Chen, T. H., & Fang, H. (2016). To engage or not to engage in corporate social responsibility: Empirical evidence from global banking sector. *Economic Modelling, 55*, 207–225. https://doi.org/10.1016/j.econmod.2016.02.007

Soana, M.-G. (2011). The relationship between corporate social performance and corporate financial performance in the banking sector. *Journal of Business Ethics, 104*, 133–148. https://doi.org/10.1007/s10551-011-0894-x

Wang, Q., Dou, J., & Jia, S. (2015). A meta-analytic review of corporate social responsibility and corporate financial performance: The moderating effect of contextual factors. *Business & Society, 55*(8), 1083–1121. https://doi.org/10.1177/0007650315584317

Wood, D. J. (1991). Corporate social performance revisited. *Academy of Management Review, 16*(4), 691–718. https://doi.org/10.2307/258977

Zhang, J. (2010). Employee orientation and performance: An exploration of the mediating role of customer orientation. *Journal of Business Ethics, 91*, 111–121. https://doi.org/10.1007/s10551-010-0570-6

Zhao, X., & Murrell, A. J. (2016). Revisiting the corporate social performance-financial performance link: A replication of Waddock and Graves. *Strategic Management Journal, 37*(11), 2378–2388. https://doi.org/10.1002/smj.2579