

# LIFE CYCLE ANALYSIS OF THE EUROPEAN BANKING SECTOR'S ESG PERFORMANCE

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Business stakeholders are becoming more involved in environmental, social, and governance (ESG) aspects. There is an increasing awareness in the financial services industry of the importance of incorporating ESG factors into strategies, processes, and financial tools to generate value over the medium and long run. While a vast body of literature examines the connection between ESG factors and company performance, only a few studies have specifically investigated the financial services industry, often employing linear models. This research specifically examines the ESG performance of the financial services industry. It utilizes a life-cycle framework to analyze the patterns and relationships of European companies in the sector. This analysis is conducted using linear panel regression models. The study's conclusions serve as crucial benchmarks for investment managers and policymakers. The findings illustrate that superior, enhanced ESG performance can bolster the financial success of industry participants.

**Keywords:**

ESG,  
bank,  
life  
cycle  
analysis

## **1 Introduction**

The impact of businesses on society and the environment beyond the economy has been debated since the mid-20th century. Business enterprises, embedded in society and the physical environment with concentrated decision-making power and therefore of great importance in many ways, affect the natural and physical environment, society, and the lives of those who interact with them. Following a period of quiet economic growth in the second half of the last century, the importance of environmental problems and the social impacts of business activities have been highlighted as social responsibility, business ethics, and the relationship with the environment have grown beyond financial indicators and become embodied in a growing concern for sustainability. Studies and organisations are using sustainability, CSR, and ESG more than ever. The above terms are often used synonymously. Despite similarities, there are important differences. Overall, the terms have different meanings. Perhaps the broadest of the three terms is sustainability. Definitions of sustainability are endless. Sustainability encompasses CSR, ESG, and other concepts. Financial services CSR, ESG, and sustainability concerns are growing due to regulation compliance, market expectations, and societal influence. These issues are crucial to financial services companies' long-term success, risk mitigation, and opportunity discovery.

This study evaluates the banking sector's environmental, social, and governance (ESG) performance, maturity, and life cycle ESG considerations. Which companies have best implemented ESG practices and the ESG rating system? Does ESG performance correlate with financial performance metrics at different maturity levels? We start by examining sustainability and ESG performance, metrics, and prior empirical findings to answer these questions. We will then introduce the dataset and methods, draw conclusions, and propose a feasible implementation.

## **2 Sustainability and ESG performance**

### **2.1 Definitions**

Sustainability is the process of running and advancing to meet the needs of the current generation while protecting the Earth's life-sustaining system, which is vital to future generations (Griggs et al., 2013). Sustainable development integrates

economic, social, environmental, and resource factors for long-term viability. It needs thorough consideration and contemplation on all these levels. The phenomenon links current and future generations, making it forward-looking (Soppe, 2004). The phrase ESG originated in 2004. Three components underpin ESG. Environmental criteria, represented by E, include the company's energy use, waste, resources, and their effects. Finally, it covers climate change and carbon emissions. A company's social criterion is its reputation and relationships in the communities and institutions where it operates. S encompasses diversity, inclusion, and labor Relations. Corporate governance involves adapting methods, controls, and procedures to manage and make effective decisions in line with the law and to satisfy external stakeholders. ESG codifies all this for investors and shareholders in a transparent and quantitative method to compare companies. It helps the company communicate its environmental and social goals in a practical way. Planning ESG values and measurements is company-specific. Even with robust ESG factor data and reporting, some organizations may implement qualitative ESG incentive targets. ESG stakeholder goals and values must be chosen to meet targets, improve stakeholder value, and not be window dressing or greenwashing (Kay et al., 2020).

As mentioned, company aims and missions have changed greatly throughout the recent century. In the past, investors paid mostly for physical assets to buy land, but today corporations are valued for intangibles like reputation, company culture, and customer loyalty. Public opinion of firms has also changed from financial market participants to social and environmental actors. ESG suggests a trade-off between short-term rewards and long-term value. ESG-performing companies perform better in ecologically and socially related areas and give higher expected returns to its legitimate shareholders, proving that doing good pays off. Material bad occurrences are more frequent in underperforming companies. Poor ESG performance can cause double-digit market cap losses (Huang, 2022).

## **2.2 Performance metrics**

In the 2010s, corporations developed ESG performance indicators to measure goals. This system is popular because it comprehensively evaluates companies' sustainability efforts and results. It goes beyond sustainability as an investor risk and provides insights into corporate sustainability for most stakeholders in corporate operations. ESG indicators focus on sustainability risks and maturity. If stakeholders

have genuine concerns and expectations about sustainability and ESG performance indicators accurately and effectively measure business organizations' sustainability performance, then corporate ESG maturity can predict medium- and long-term success and efficiency. Commercial banks' role in the monetary system, the economy, and financial stability cannot be overstated. This alone necessitates an industry analysis. Through lending, banks connect with many economic actors and help start and grow businesses. Thus, banks may benefit from ESG studies of corporate clients. The current study examines banks' ESG maturity and internal financial ratios.

The size of a company can be measured by market capitalization, assets, employees, or board of directors. Studies have consistently found a positive correlation between commercial bank size and ESG rating. Big banks have more resources to execute ESG activities, which may improve ESG scores and performance (Jaiwani & Gopalkrishnan, 2023). Due to their regulatory background, larger banks have produced more detailed sustainability reports for longer periods. They can now focus on sustainability issues for a longer time (Lamanda & Tamásné Vóneki, 2024). The life cycle approach suggests that a bank's ESG rating improves as it spends more time on sustainability issues. As a company grows, its stakeholders grow, increasing the need for responsibility, visibility, and awareness.

Thus, ESG disclosure increases (El Khoury et al., 2023). The average major financial institution has been more proactive and engaged in ESG efforts for longer, improving their ESG performance. To meet investors' and regulators' latest standards, banks often overinvest in ESG initiatives (Michael et al., 2023). Board size and composition matter: larger boards with female and independent directors perform better in ESG maturity (Gurol & Lagasio, 2023). Some studies also suggest that ownership structure and bank size may affect ESG activities (Jaiwani & Gopalkrishnan, 2023).

Early research on ESG maturity and financial performance has found conflicting results. Contrary to expectations, social ESG practices have hurt financial performance but improved efficiency (Jaiwani & Gopalkrishnan, 2023). One possibility is that banks' ESG scores negatively affect their financial performance. Less profitable banks publish more ESG information and prioritize its improvement to offset their poor financial performance (El Khoury et al.). Performance changes

show that banks' sustainability performance improves as sustainability initiatives and ESG programs grow. However, this does not necessarily improve financial performance, even over time. The complexity of isolating additional influences makes this difficult to study (Ahmed et al., 2019). A different study finds a positive correlation between ESG reporting and bank profitability. This suggests that banks that outperform in ESG have better financial results (Gurol & Lagasio, 2023).

### 3 Analysis of the data set

#### 3.1 Presentation of the data set and ESG rating methodology

The study focused on a population of 181 businesses included in the Refinitiv Eikon database. These organizations were classed in the banking sector under Financials / Banking & Investment Services / Banking Services / Banks. All of them were located in the European Union and were operational in 2023 (as of the query date: 13 December 2023). The examination of ESG life cycle attributes, utilizing their data, concentrates on the timeframe spanning from 2013 to 2022. Out of the total of 181 banks, only 4 were registered during the period being studied. This means that 177 banks were already operating in 2013. Additionally, 110 banks did not have any ESG ratings for any of the years being reviewed. There were only 2 banks that fell into both of these subpopulations. As a result, 74.5% of the total population (68 banks) were able to be analyzed from an ESG perspective without any bias caused by changes over time. Therefore, we have chosen to focus our further analysis solely on these banks.

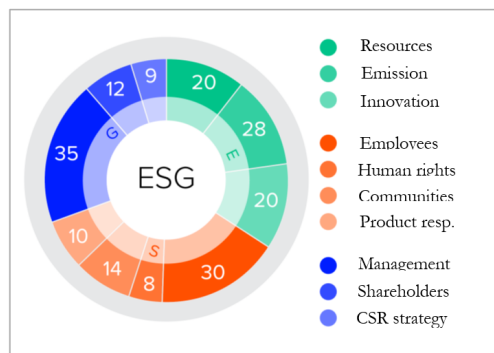


Figure 1: ESG assessment sub-domains in Refinitiv's assessment methodology

Source: Refinitiv, 2022

Refinitiv employs around 630 company-level variables to enter into its ESG assessment model, which evaluates and classifies sustainability risk. To account for the unique characteristics of each sector, the indicators used are limited to those specific to the industry. In all instances, the ESG values are derived from the 186 most relevant indicators to the industry, with a weighting selected for the sector. The input indications that constitute the pillars can be categorized into ten groups, enhancing the evaluation context's complexity (Figure 1). In addition to the ESG composite indicator value, the scores for each particular pillar are also published on the output side. The allocation of weight to the several pillars in the composite indicator is likewise distinctive to each sector: the significance of the environmental and social pillars differs among industries, whilst the governance pillar remains constant across all sectors. The pillars and the composite indicator output are evaluated on a scale of 0 to 100 (Refinitiv, 2022).

Based on an analysis of 68 companies, it can be inferred that the ESG composite indicator and the rank correlation between the pillars indicate that the overall evaluation of the sector being studied is primarily influenced by the social and governance pillars. This means that the significance of sustainability factors, which affect both the financial performance of banks and their impact on the environment, is predominantly interpreted within these areas. It is comprehensible, considering the overall significance of corporate governance and the sector's substantial involvement in the economic process, which can have significant social consequences. However, the sector's direct environmental impact is relatively minor compared to sectors like transportation or energy. Nevertheless, the robust and noteworthy association between the scores of the pillars indicates that the methodology views sustainability programs as an intricate system.

Out of the 68 farms surveyed, 66.2% (45) had a consistent ESG score for all 11 years. The number of individuals who have obtained certification (ESG rating) is consistently growing each year. The descriptive statistics depicted in Figure 2 indicate that the companies that initially fulfilled the ESG reporting criteria maintained their certification in the following years. Only one bank had missing data for a year after obtaining certification, suggesting a sustained dedication to ESG initiatives.

```
. xtdescribe
```

ID:	1, 20, ..., 3735	n =	68
Year:	2013, 2014, ..., 2022	T =	10
Delta(Year) = 1 unit			
Span(Year) = 10 periods			
(ID*Year uniquely identifies each observation)			

Distribution of T_i:							
min	5%	25%	50%	75%	95%	max	
1	2	6	10	10	10	10	

Freq.	Percent	Cum.	Pattern
45	66.18	66.18	1111111111
6	8.82	75.00	....11111
5	7.35	82.35	.....11
3	4.41	86.76	.....111
3	4.41	91.18	...111111
2	2.94	94.12	.....1111
1	1.47	95.59	.....1
1	1.47	97.06	...1111111
1	1.47	98.53	..11111111
1	1.47	100.00	(other patterns)
68	100.00		XXXXXXXXXX

Figure 2: Descriptive statistics

Source: Own

Furthermore, the influence of the changing regulatory landscape is apparent, alongside societal expectations. This is demonstrated by a significant rise in the use of sustainability reporting in non-financial reporting during the late 2010s. As a result, there has been a notable increase in the number of companies that qualify for ESG assessment (Figure 3).

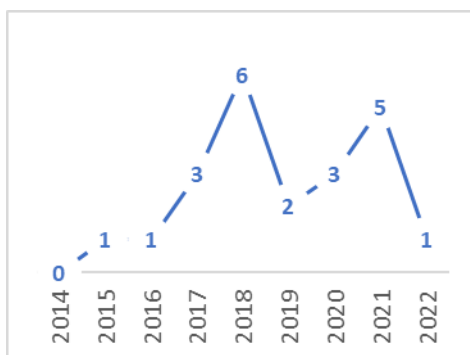


Figure 3: Number of first-time ESG-certified organizations in the population for a given year

Source: Own

Simultaneously, one could contend that creating an information system for ESG rating is highly intricate and demanding endeavor that requires substantial resources. Out of the 110 banks that were already in operation in 2013, only 46 were ESG certified (meaning they reported their environmental, social, and governance practices) in that year. In the following 10 years, out of the 131 new institutions, only 22 managed to establish an ESG framework and obtain certification.

### **3.2 The time dimension of ESG initiatives**

In order to assess the development of ESG maturity, we examined the data of banks that were assessed for each year within the specified period, searching for recurring trends. By analyzing the entities' scores over time, it is evident that the rating scale used in Refintiv's developed methodology is appropriate. The scores of each entity are spread out across the scale, and this distribution is proportional. However, it should be noted that the distribution does not follow a normal pattern based on statistical tests (Figure 4). The scores for the environmental leg exhibit significant variation when compared to the other two pillars. The diagram also demonstrates that overall ESG maturity results in substantial enhancements in the social and governance aspects. However, for the environmental aspect, the evolving expectations and limited range of effective initiatives limit the potential for considerable advancements in this domain.

Based on the results, sustainable and responsible tourism prioritises environmental and natural sustainability over social sustainability, culture, ethics, and destination care. This highlights the significance of the 'E' pillar in ESG, which is also evident in other sectors.



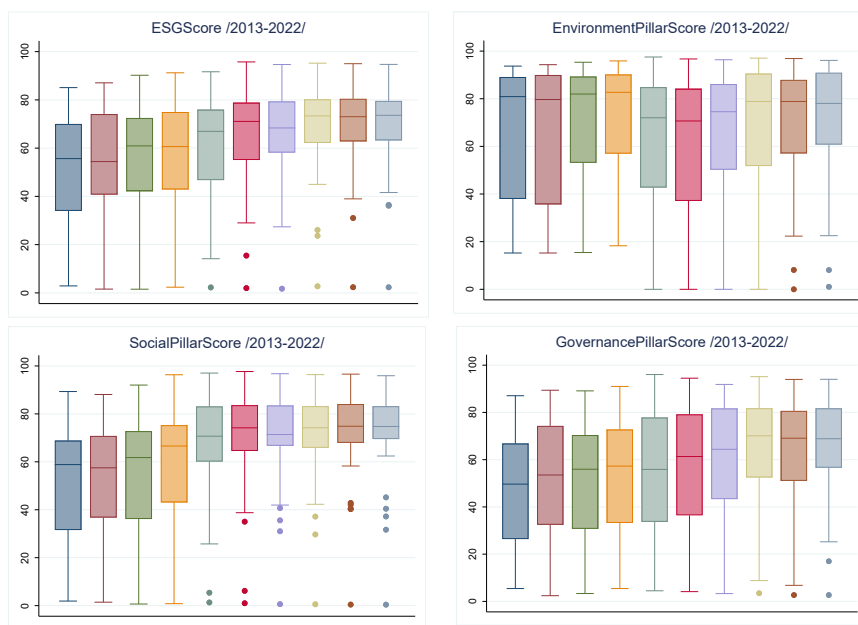


Figure 4: Box plot of the composite indicator and the scores of the pillars for each year

Source: Own

Variable	Mean	Std. dev.	Min	Max	Observations
ESGScore overall	61.45651	21.46191	1.525472	95.74035	N = 450
between	19.19802	2.171675	14.45325	88.12234	n = 45
within	9.971829	14.45325	88.12234	88.12234	T = 10
Enviro-e overall	66.64265	27.06048	0	97.53115	N = 450
between	24.16542	8.644335	8.644335	95.04658	n = 45
within	12.64939	17.78306	17.78306	114.8584	T = 10
Social-e overall	64.25688	22.59861	.3861998	97.67497	N = 450
between	19.40472	.9000333	.9000333	91.28672	n = 45
within	11.90384	-.2303826	-.2303826	93.75473	T = 10
Govern-e overall	57.79159	24.04703	2.407407	96.0329	N = 450
between	21.14427	3.739116	3.739116	88.44745	n = 45
within	11.83811	19.13753	19.13753	94.88768	T = 10

Figure 5: Descriptive statistics for the panel

Source: Own

The composite indicator outputs and variable values of the pillars exhibit an approximate average of 60 on a continuous scale ranging from 0 to 100. Among the pillars, the environmental pillar exhibits the highest average, while the management

pillar demonstrates the lowest average. The variance, which represents the variation in individual scores, is greatest for the environmental pillar. This means that the scores in this area are the most diverse, as demonstrated in Figure 5. The scores are dispersed throughout the entire measuring scale based on the minimum and maximum scores. By utilizing the panel data structure, it was feasible to examine the degree of variation in organization’s ratings compared to peers and their own scores over time. Regarding the former (between), the indicator value (Standard deviation) is significantly higher. This means that even though the scores of the companies change from year to year, each entity has unique characteristics that confirm the suitability of the individual valuation approach. The observed banking sector exhibits a low variance in capturing changes across the observation period. However, notable fluctuations in scores can still be noticed, even within a short timeframe. The ESG composite indicator scores per firm improved by an average of 2.06 points per year, with a standard deviation of 6.30, as determined by the difference between consecutive years. When comparing scores from years that are further apart, the average positive change in ESG scores per unit of time is nearly constant. However, the variability of the change is growing. The fixed-effect linear panel model also confirms that a larger number of rated years results in a significantly higher ESG score: the completion of ESG initiative year on year results in a higher ESG score by 2.3 points on average, *ceteris paribus* (Figure 6).

```

. xtreg ESGScore ESGScoreOld, fe
-----+-----
Fixed-effects (within) regression      Number of obs   =    450
Group variable: ID                    Number of groups =    45

R-squared:                             Obs per group:
  Within = 0.4423                       min           =    10
  Between = .                             avg            =   10.0
  Overall = 0.0955                       max           =    10

corr(u_i, Xb) = -0.0000                  F(1,404)       =   320.45
                                           Prob > F       =    0.0000
    
```

ESGScore	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
ESGScoreOld	2.306426	.1288432	17.90	0.000	2.053139	2.559713
_cons	48.77117	.7994509	61.01	0.000	47.19956	50.34277
sigma_u	19.19802					
sigma_e	7.8504523					
rho	.85673985	(fraction of variance due to u_i)				
F test that all u_i=0: F(44, 404) = 59.80					Prob > F = 0.0000	

Figure 6 - Fixed effect panel model with ESG score as a dependent variable and number of years rated as an explanatory variable

Source: Own

### 3.3 ESG and financial performance

A strong correlation was observed between the ESG index and companies' total assets (Figure 7). This might be construed as a sign that bigger corporations, which often possess greater resources and prominence, might have a higher ability or willingness to invest in and execute ESG projects. This may be attributed to increased public scrutiny, the possibility of greater effects on sustainability objectives, or a more robust financial capacity to allocate resources towards ESG policies. It indicates that the size of a corporation, as determined by its total assets, may be related to its dedication to and success in environmental, social, and governance aspects.

ESGScore	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
TotAssets	1.48e-11	5.65e-12	2.62	0.009	3.67e-12	2.59e-11
_cons	55.77523	2.327763	23.96	0.000	51.19816	60.35229
sigma_u	16.125222					
sigma_e	9.819837					
rho	.72947494	(fraction of variance due to u_i)				

F test that all u_i=0: F(41, 376) = 26.00				Prob > F = 0.0000		
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Figure 7: Fixed effect panel model with ESG score as a dependent variable and Total assets as an explanatory variable

Source: Own

We also analyzed the relationship between corporations' operating cash flow, capital expenditures (CAPEX), dividend distribution, and their ESG ratings. The European banking sector exhibited no meaningful correlation in any of these instances. Nevertheless, we discovered a noteworthy outcome regarding the weighted average cost of capital and profit after tax. The latter behaviour is unexpected but may also be unique to the sector. Putting profit after tax in context is challenging because banks use legal accounting practices to stabilize it artificially (Takács et al., 2020). We

observed a substantial positive correlation, while the explanatory capability was small. The feeble yet substantial positive correlation for total liabilities is even more surprising. This implies that companies with greater debt may be allocating resources towards ESG activities to advance their expansion plans or bolster their public image. This suggests that there is recognition that implementing robust environmental, social, and governance (ESG) standards can result in more favourable financial conditions for lenders who are increasingly taking sustainability considerations into account when making loan choices. It could also suggest that companies use their debts to fund sustainable initiatives that enhance their ESG ratings (Figure 8).

```
. xtreg ESGScore TotLiab, fe
```

ESGScore	Coefficient	Std. err.	t	P> t	[95% conf. interval]
TotLiab	1.42e-11	5.72e-12	2.48	0.013	2.96e-12 2.55e-11
_cons	56.33007	2.227955	25.28	0.000	51.94925 60.71088
sigma_u	16.316801				
sigma_e	9.8284916				
rho	.733767	(fraction of variance due to u_i)			

Fixed-effects (within) regression  
Group variable: ID  
R-squared:  
Within = 0.0161  
Between = 0.3385  
Overall = 0.2760  
corr(u\_i, Xb) = 0.2247  
Number of obs = 419  
Number of groups = 42  
Obs per group: min = 9, avg = 10.0, max = 10  
F(1,376) = 6.17  
Prob > F = 0.0134  
F test that all u\_i=0: F(41, 376) = 26.16 Prob > F = 0.0000

**Figure 8: Fixed effect panel model with ESG score as a dependent variable and Total Liabilities as an explanatory variable**

Source: Own

## 4 Conclusion

The study's findings indicate that the identified characteristics particular to the life cycle and the strong relationships between individual performance metrics and the ESG indicator yield a practical conclusion. If an organization acquires an ESG certification, they will maintain the certification in subsequent years. This analysis includes firms who were still active during the last year of the study, ensuring that factors such as dissolution or transformation do not influence the results. Therefore, it can be concluded that as time progresses, the likelihood of a firm having or having

had an ESG certification increases. The correlation between total assets, total liabilities, and ESG scores implies that organisations' financial size and dedication to sustainability are closely linked for professionals in the field. Companies should use their financial resources to improve their ESG programs. This can positively impact their reputation, risk management, and attractiveness to investors. For banks, implementing sustainable financing methods brings societal and environmental benefits and offers strategic advantages by improving their competitive position and aligning with global sustainability trends. This demonstrates the growing significance of the ESG phenomena.

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### References

- Ahmed, S. P., Ahmed, S. U., Noor, M. F., Ahmed, Z., & Karmaker, U. (2019). The policy-led sustainability and financial performance linkage in the banking sector: case of Bangladesh. *Banks and Banking Systems*, 14(4), 89-103. [https://doi.org/10.21511/bbs.14\(4\).2019.09](https://doi.org/10.21511/bbs.14(4).2019.09)
- El Khoury, R., Nasrallah, N., & Alareeni, B. (2023). The determinants of ESG in the banking sector of the MENA region: a trend or necessity? *Competitiveness Review*, 33(1), 7-29. <https://doi.org/10.1108/CR-09-2021-0118>
- Griggs, D., Stafford-Smith, M., Gaffney, O., Rockström, J., Öhman, M. C., Shyamsundar, P., Steffen, W., Glaser, G., Kanie, N., & Noble, I. (2013). Sustainable development goals for people and planet. *Nature*, 495(7441), 305-307. <https://doi.org/10.1038/495305a>
- Gürol, B., & Lagasio, V. (2023). Women board members' impact on ESG disclosure with environment and social dimensions: evidence from the European banking sector. *Social Responsibility Journal*, 19(1), 211-228. <https://doi.org/10.1108/SRJ-08-2020-0308>
- Huang, P. H. (2022). Realizing Diversity, Sustainability, and Stakeholder Capitalism. *Sustainability, and Stakeholder Capitalism* (February 19, 2022).
- Jaiwani, M., & Gopalkrishnan, S. (2023). Do private and public sector banks respond to ESG in the same way? Some evidence from India. *Benchmarking*. <https://doi.org/10.1108/BIJ-05-2023-0340>
- Kay, I., Brindisi, M., & Martin, B. (2020). The Stakeholder Model and ESG. In *Harvard Law School Forum*
- Lamanda, G., & Tamásné Vőneki, Z. (2024). Is ESG disclosure associated with bank performance? Evidence from the Visegrad Four countries. *Management of Environmental Quality: An International Journal*, 35(1), 201-219. <https://doi.org/10.1108/MEQ-02-2023-0064>
- Michael, J., Awad, A. B., & Khalaf, B. A. (2023). EXPLORING ENVIRONMENTAL, SOCIAL, AND GOVERNANCE AND BANK PERFORMANCE IN THE GULF COOPERATION COUNCIL REGION. *Corporate Law and Governance Review*, 5(2 (special issue)), 192-200. <https://doi.org/10.22495/clgrv5i2sip6>
- Refinitiv (2022): Environmental, Social and Governance scores from Refinitiv - May 2022. Retrieved from Refinitiv,

[https://www.refinitiv.com/content/dam/marketing/en\\_us/documents/methodology/refinitiv-esg-scores-methodology.pdf#RE1606884\\_ESG\\_Methodology\\_A4\\_v2.indd%3A.7049%3A155](https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf#RE1606884_ESG_Methodology_A4_v2.indd%3A.7049%3A155) Date of retrieval: 10.08.2028.

- Soppe, A. (2004). Sustainable Corporate Finance. *Journal of Business Ethics*, 53(1), 213-224. <https://doi.org/10.1023/B:BUSI.0000039410.18373.12>
- Takacs, A., Szucs, T., Kehl, D., & Fodor, A. (2020). The effect of fair valuation on banks' earnings quality: empirical evidence from developed and emerging European countries. *HELIYON*, 6(12). <http://doi.org/10.1016/j.heliyon.2020.e05659>