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An Analysis of the Banking Sectors: The effect of Ecosystem Performance on Financial Stability

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Abstract

With an emphasis on the effects of regional differences and the COVID-19 epidemic, this study examines the link between Environmental Performance Index (EPI) ratings and the financial performance of European banks while considering the role of governance and law. Our study, which uses panel data regressions spanning five years and 71 listed banks in 21 European nations, shows a negative link between EPI scores and bank performance, which is most noticeable in Southern Europe. These results highlight the significance of taking regional variations in bank size and characteristics into account when assessing EPI performance in the banking industry.

Keywords: Governance, Law, Environmental Performance, Financial Performance, Banks, Sustainability.

Introduction

EPI measures help assess a business's contributions beyond maximizing profits, considering governance, social, and environmental factors (Esty & Levy, 2019). The prevalence of sustainability reporting has increased, encouraging openness on governance, social justice, and environmental stewardship (KPMG, 2017). Both national emissions reduction programs and global environmental concerns depend on EPI measures (European Union, 2014).

Governments have implemented laws, regulations, and frameworks to solve EPI challenges. For instance, the European Union introduced a non-financial reporting mandate in 2014 (European Union, 2014). Stakeholders, including practitioners, investors, and policymakers, are showing more interest in sustainability due to its potential benefits, such as improved risk management, cost efficiencies, support for decision-making, and enhanced corporate reputation (KPMG, 2017).

In the banking sector, which plays a vital role in economic and social development, aligning operations with social, governance, and economic

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objectives is crucial (Hsu & Chiu, 2019). The 2007 financial crisis emphasized the importance of transparency and accountability, increasing awareness of EPI issues and prompting financial institutions to enhance their social responsibility initiatives to instill confidence and credibility.

Moreover, studying EPI in the banking sector is challenging due to unique attributes, such as distinct accounting standards, reporting incentives, and risk exposures (Oikonomou & Brooks, 2020). Although European nations are leading sustainable development initiatives, more conclusive empirical evidence is necessary on the direct relationship between bank value and EPI. This study aims to evaluate recent data, considering the impact of the COVID-19 pandemic, to determine if it is consistent with previous research findings or if rapid responses to emerging issues over the past five years have distorted the results.

As financial institutions attempt to preserve continuity and negotiate interruptions, the epidemic has increased attention to EPI areas. It is critical to investigate the relationship between EPI and the financial performance of European banks under current conditions, as it may have consequences for how they position themselves for sustainability.

Additionally, by evaluating business performance across all three EPI pillars, this research expands on earlier studies into sustainability reporting. By combining a variety of EPI policy variables from the Bloomberg database and assessing bank performance using stock and asset returns, this study offers insightful information on the difficulties associated with investing in and managing EPI risks. However, the study's scope is restricted to data from European banks for the previous five years due to the availability of EPI data.

Literature Review

In modern corporate governance and sustainability research, the connection between financial success and Environmental, Social, and Governance (EPI) fulfillment is a topic of great interest. Stakeholder, trade-off, and stewardship theories are just a few theoretical frameworks academics have used to study this connection. These frameworks provide different insights into how firms and their management should include EPI factors in their business plans.

According to Donaldson and Preston's (1995) stakeholder theory, businesses have an ethical duty to maximize value for all parties involved, not just shareholders. This theory emphasizes the importance of EPI initiatives as sources of opportunity, competitive advantage, and innovation rather than as burdens or restrictions. In contrast, the Trade-off theory, influenced by Jensen (2002), views EPI activities as potentially wasteful uses of capital that may divert resources from more profitable endeavors, prioritizing firm value over societal advancements.

The Stewardship approach highlights managers as stewards committed to increasing the company's long-term worth by balancing stakeholders' interests. Increased EPI activity should benefit the company and enhance its value (Davis et al., 1997).

Advocates of sustainability reporting argue that disclosing EPI information can benefit both firms and stakeholders by enhancing decision-making, transparency, financial stability, and social sustainability (Eccles & Krzus, 2010; Eccles et al., 2011). Research has shown a nonlinear but generally positive correlation between financial performance and EPI strategies (Fulton et al., 2012), with studies indicating a positive relationship between EPI and financial performance, particularly in climate change and low-carbon studies (Whelan et al., 2021). Tang (2019) suggests that EPI standards may protect businesses from stock market crashes, contributing to financial stability.

However, the relationship between EPI and firm performance is only partially decisive, with conflicting findings across studies. Studies in the banking sector have shown varied results. While some suggest a positive correlation between EPI and financial performance, others find no significant linear relationship (Valerio Potì, Di Martino, & Miglietta, n.d.; Ersoy et al., 2022). Moreover, theoretical frameworks and empirical evidence suggest that the relationship between EPI performance and bank value may be complex, with nonlinear associations and potential trade-offs between EPI pillars (This is supported by both theoretical frameworks and empirical evidence. Authors such as Ersoy, Swiecka, Grima, Özen, and Romanova (2021)

Evidence from the COVID-19 pandemic suggests that firms and institutions with higher EPI ratings fared better throughout the crisis, underscoring the significance of these factors (Zhao & Ding, 2015; Shin & Park, 2023; Amin & Viganola, 2021).

This has underscored the need to accelerate the transition toward a low-carbon and more sustainable global economy (Robins, 2020). Considering these factors, this study explores the linear correlations between EPI performance and financial measures, particularly in the banking sector, where return on equity (ROE) and return on assets (ROA) are measured.

Methodology

Data Collection

We collected a comprehensive dataset of 355 observations from 71 listed banks across 21 European countries over five years, from 2018 to 2022. The data was gathered in July 2023 from two reliable sources, Bloomberg and the International Monetary Fund. In order to ensure consistency, we only included European banks with available Ethical Performance Indicators data from Bloomberg. In cases where financial and control metric data were missing from Bloomberg, we referred to annual reports from select banks to supplement the dataset. Initially, 73 banks were considered for the study, but after careful analysis, two banks were excluded due to missing control variable metrics, resulting in a final sample of 71 banks. The selection criteria for data availability from 2018 to 2022 align with previous research in the banking industry. We are focusing on identifying and analyzing specific factors to gain insights. To collect data on Ethical Performance Indicators scores, we utilized the Ethical Performance Indicators from Bloomberg. This included the Combined Ethical Performance Indicators score, Environmental Performance Index (EPS), Social Performance Score (SPS), and Governance Performance Score (GPS). The scale of scores spans from 0 to 100, where 100 denotes the ultimate highest score attainable. The Combined Ethical Performance Indicators score comprehensively evaluates a bank's Ethical Performance Indicators, considering all Ethical Performance Indicators pillars while discounting any reported controversies. Previous studies in the banking sector have used this as a primary independent variable.

We analyzed the three dimensions of Ethical Performance Indicators (environmental, social, and governance factors) individually, covering categories such as resource utilization, emissions reduction, workforce management, adherence to human rights, community engagement, product reliability, management practices, shareholder treatment, and corporate social responsibility strategies. Our investigation focuses on two dependent variables: We have gathered information regarding Return on Equity (ROE) and Return on Assets (ROA) from the Bloomberg database and banks' annual financial reports. Return on Assets (ROA) indicates the profitability of all assets and provides insight into how effectively the assets are being used. On the other hand, Return on Equity (ROE) is used to evaluate the profitability of shareholders' equity, making it a crucial factor in the decision-making process for capital allocation and financial performance. We incorporated several control variables to distinguish the link between the dependent and independent variables. These variables consider any

potential confounding variables that could affect our study. Bank-specific controls such as NETL (net loans to total assets), BETA (market sensitivity), and SIZE (logarithm of total assets) were used to account for variations in bank size, market sensitivity, and loan portfolio management. In addition, we included macroeconomic controls like GDP growth and inflation rate to consider the effects of external economic factors on bank performance.

Results from Primary Data

Descriptive Statistics

The descriptive statistics of Table 1 indicate exciting trends in the financial metrics and Ethical Performance Indicators (EPI) of selected institutions. The sample banks have an average EPI score of 60, reflecting moderate environmental, social, and governance performance levels. Although noteworthy, the results fall short of expectations and suggest that the examined institutions' EPI processes require further improvement.

The banks' environmental performance varies significantly, as evidenced by the standard deviation 26 in the Environmental Performance Index (EPS). While some banks have low scores, indicating room for improvement in environmental sustainability efforts, others have exceptional environmental standards, as demonstrated by their high EPS values.

It is crucial to note the variability in EPI scores, as this can significantly impact the dependent variables analyzed. Therefore, it is essential to consider EPI metrics adequately in future research.

Table 1: Descriptive Statistics

Metric	N	Mean	St. Dev.	Min	Max
ROA	**355**	**0.72**	**0.75**	**-4.05**	**4.33**
ROE	**355**	**8.86**	**6.48**	**0.75**	**30.90**
EPI	**355**	**60.05**	**13.45**	**25.56**	**92.18**
EPS	**355**	**65.08**	**26.25**	**4.00**	**97.31**
GPS	**355**	**66.15**	**19.82**	**18.30**	**94.85**
SPS	**355**	**70.35**	**15.12**	**26.43**	**97.67**

Note: ROA and ROE values are expressed in percentages.

The descriptive statistics for the control variables are displayed in Table 2, and they reveal a heterogeneous distribution among the characteristics of a few chosen banks.

Table 2: Descriptive Statistics of Control Variables

Statistic	N	Mean	St. Dev.	Min	Max
TA	355	357822	561448	4797	2786521
BETA	355	1.34	0.43	0.39	2.96
NETL	355	0.58	0.15	0.12	0.88
GDP	355	1.94	4.85	-11.30	13.60
INF	355	3.20	3.48	-1.30	15.10

Note: GDP and INF are percentages, while TA is in EUR Millions.

As we can see, the average score of 60 for the Ethical Performance Indicator (EPI) suggests moderate levels of environmental, social, and governance performance among the banks. However, this falls short of expectations and indicates a need for further improvement in the EPI processes of the examined institutions. The standard deviation of 13.45 highlights the significant differences in environmental performance among the banks. Some banks demonstrate lower EPI scores, signaling opportunities for enhancing environmental sustainability efforts, while others exhibit exceptional standards, as indicated by higher EPI values.

It is essential to recognize the impact of EPI metrics on the dependent variables analyzed. Future research should adequately consider these metrics to understand their influence on bank performance and financial outcomes. Turning to the financial metrics, the descriptive statistics reveal noteworthy trends. The Return on Assets (ROA) and Return on Equity (ROE) demonstrate average values of 0.72% and 8.86%, respectively. This suggests variations in profitability levels across the sample banks. Similarly, the Gross Profit Margin (GPM) and Sales Per Share (SPS) demonstrate average values of 66.15% and 70.35%, respectively, indicating differences in profitability and sales performance among the institutions.

Analyzing the control variables, the mean Total Assets (TA) stand at €357,822 million, with a broad standard deviation of €561,448 million, reflecting diversity in asset sizes among the banks. The Beta (BETA) also demonstrates a mean of 1.34, indicating varying market risk exposures across the sample.

Exploring the relationship between ethical performance indicators (epis) and financial performance

This section explores the intricate relationship between ethical performance indicators (EPIs) and financial performance. Through structured analysis, we endeavor to uncover critical insights into the impact of EPIs on various financial aspects. To this end, we will break down EPIs into individual pillars to examine the impact of each pillar on financial performance in greater detail. This methodology will facilitate the identification of the precise impacts of social, governance, and environmental issues on financial metrics, hence fostering a more sophisticated comprehension of their interplay. Moreover, we will conduct a size-based regression analysis to understand further how EPIs and financial success are related. By stratifying banks by asset volume, we will examine the impact of operational size on the relationship between financial measures and EPIs. The route analysis will provide information on possible size-dependent changes in this relationship using the total assets' median value as a boundary value. In addition, we will investigate regional differences in how EPIs affect financial performance in Northern, Central, and Southern Europe. By dividing Europe into geographically separated areas with different economic features, we aim to identify differences between financial measures and EPIs. This regional approach will provide valuable insights into how contextual variables may affect the impact of EPIs on financial results in specific geographic contexts.

Northern Europe comprises Belgium, Denmark, Finland, Germany, the Republic of Ireland, the Netherlands, Norway, Sweden, and the United Kingdom. This region represents a diverse spectrum of advanced economies with robust financial systems. Central Europe, on the other hand, comprises Austria, the Czech Republic, France, Hungary, Poland, Romania, and Switzerland. Characterized by a blend of established and emerging markets, this region offers unique insights into the interplay between EPIs and financial performance. Lastly, Southern Europe encompasses Cyprus, Greece, Italy, Portugal, and Spain. It presents a rich tapestry of economies with distinctive cultural and economic landscapes. Examining the impact of EPIs in this region sheds light on the complexities of sustainable finance in Mediterranean and Iberian contexts.

Statistical Model Specification and Diagnostic Analysis

To investigate the relationship between Ethical Performance Indicators (EPIs) and banking sector performance, we estimate the following models based on the pathways delineated in the methodology and alignment with extant literature:

- Bank Performance (BP) = β0 + β1 * EPI_t-1 + β2 * SIZE + β3 * BETA + β4 * NL + β5 * GDP + β6 * INF + ai + uit
- Bank Performance (BP) = β0 + β1 * EPS_t-1 + β2 * SIZE + β3 * BETA + β4 * NL + β5 * GDP + β6 * INF + ai + uit
- Bank Performance (BP) = β0 + β1 * SPS_t-1 + β2 * SIZE + β3 * BETA + β4 * NL + β5 * GDP + β6 * INF + ai + uit
- Bank Performance (BP) = β0 + β1 * GPS_t-1 + β2 * SIZE + β3 * BETA + β4 * NL + β5 * GDP + β6 * INF + ai + uit

BPit represents bank performance at time t for bank i. Among the independent variables are:

- *EPIit−1: The Ethical Performance Indicator (EPI) was one period ahead of schedule.*
- *Earnings Per Share (EPS) was one period behind schedule, or EPSit−1.*
- *SPSit−1: One period was added to the Social Performance Score (SPS).*
- *GPSit: The Governance Performance Score (GPS) was one session behind schedule.*
- *Size: The bank's dimensions at time t.*
- *Betait: The bank's market beta is at a specific time.*
- *NPLit: The ratio of non-performing loans at time t.*
- *GDPit stands for GDP Growth Rate at Time T.*
- *Inflation: Rate of inflation at point t.*

Furthermore, the error term is represented by uit, and individual-specific effects are denoted by ai. This model aims to examine how different factors affect bank performance over time.

Model Selection and Diagnostic Testing Procedures

To ensure the reliability of our panel model, we conducted several tests before analyzing our primary variables of interest.

Panel Model Selection: We utilized panel data regressions and implemented fixed and random-effects models to control unobserved heterogeneity and reduce collinearity among independent variables. Hausman Test: The Hausman test guided our selection between fixed and random-effects models, primarily favoring random-effects models with a few exceptions.

Stationarity Tests: Augmented Dickey-Fuller tests confirmed the stationarity of dependent variables throughout the study period, ensuring consistent statistical characteristics over time.

Homoscedasticity Testing: Breusch-Pagan tests revealed heteroskedasticity in the residuals, indicating variance inconsistencies across independent variables.

Autocorrelation Analysis: Breusch-Godfrey/Wooldridge tests detected autocorrelation in some models, requiring clustered standard errors to mitigate its effects.

Multicollinearity Assessment: VIF tests and multicollinearity checks confirmed no evidence of multicollinearity issues among independent variables.

Endogeneity Control: The utilization of lagging EPIs and the three pillars addressed endogeneity concerns, resulting in a more robust analysis of the performance link.

Normality Testing: Kolmogorov-Smirnov tests indicated non-normality in residuals, which could be attributed to variable volatility and outlier effects, especially in GDP and INF due to COVID-19 impacts.

By utilizing heteroskedasticity-robust standard errors clustered at the bank level and addressing other diagnostic findings, we ensure the robustness and validity of our model estimates for rigorous research purposes.

Pearson Correlation Analysis

The Pearson correlation analysis, employing Ethical Performance Indicators (EPI) rather than EPI, provides valuable insights into the relationships between financial metrics. Table 5.1 presents these correlations in a format akin to SPSS output. A robust positive correlation is observed between Return on Assets and Return on Equity. However, the correlation between EPI and ROA or ROE appears insubstantial. Additionally, negative correlations between financial

performance metrics such as Earnings Per Share (EPS) and Social Performance Score (SPS) hint at nuanced dynamics within their interrelations.

Table 3 Correlation Matrix of Financial Performance Metrics

	ROA	ROE	EPI	EPS	GPS	SPS
ROA	**1.000**	**0.794**	**0.027**	**-0.248**	**0.008**	**-0.238**
ROE	**0.794**	**1.000**	**0.132**	**-0.056**	**0.096**	**-0.111**
EPI	**0.027**	**0.132**	**1.000**	**0.368**	**0.508**	**0.482**
EPS	**-0.248**	**-0.056**	**0.368**	**1.000**	**0.364**	**0.644**
GPS	**0.008**	**0.096**	**0.508**	**0.364**	**1.000**	**0.420**
SPS	**-0.238**	**-0.111**	**0.482**	**0.644**	**0.420**	**1.000**

Note. ROA = Return on Assets; ROE = Return on Equity; EPI = Environmental Performance Index; EPS = Earnings per Share; GPS = Gross Profit Margin; SPS = Sales per Share. Correlation coefficients are above the diagonal, and p-values are below the diagonal.

Results of Correlation between Ethical Performance Indicators and Financial Metrics in Banking" - Insights from Analysis

In analyzing the foundational model (Table 3), which incorporates EPI, no significant correlation emerges between EPI and bank performance metrics. This suggests that factors beyond EPI, both internal and external, exert considerable influence over financial performance. Notably, the inclusion of GDP underscores its significant impact on the observed results. The absence of the intercept in the Random-effect model aligns with the study's focused objectives. The basic model's findings show that important bank performance metrics, including return on equity (ROE), return on assets (ROA), and ethical performance indicators

(EPI), do not significantly correlate with one another. This discovery prompts a more profound examination of the intricate dynamics within the banking sector and the implications for ethical practices.

One possible interpretation of this lack of correlation is that ethical considerations are fundamental for long-term sustainability and reputation management but may not result in immediate financial returns. Banks may prioritize short-term financial objectives, such as profit maximization and cost efficiency, over long-term ethical considerations. In highly competitive and rapidly changing market environments, this short-term focus might overshadow the perceived benefits of ethical practices in the eyes of stakeholders.

Additionally, the insignificance of the relationship between EPI and bank performance metrics implies that other internal and external factors could significantly influence financial outcomes. Internally, factors such as operational efficiency, risk management practices, and strategic decision-making processes could play pivotal roles in determining bank profitability. Externally, regulatory frameworks, market conditions, and economic fluctuations may exert significant pressure on financial performance, potentially diluting the impact of ethical practices.

Another critical aspect is the inherent complexity and subjectivity in measuring and interpreting EPI. Variations in reporting standards, data quality, and the subjective assessment of ethical behaviors could contribute to discrepancies in EPI scores across different banks and regions. As a result, empirical studies may present inconclusive findings, obscuring or misrepresenting the true extent of the relationship between ethical practices and financial performance.

Strategically, the insignificant correlation between EPI and bank performance metrics highlights the need for a balanced approach to corporate decision-making. While ethical considerations are critical to building trust and maintaining stakeholder relationships, banks must prioritize operational efficiency, risk management, and innovation to remain competitive and profitable. Integrating ethical principles into core business strategies and aligning them with financial objectives could foster a culture of responsible banking while enhancing long-term value creation.

The lack of a significant correlation between EPI and bank performance metrics emphasizes the complex interplay between ethical practices and financial outcomes in the banking sector. This research emphasizes the importance of having a sophisticated grasp of the variables influencing financial performance and how ethical issues should be included in more comprehensive strategy

frameworks. By adopting a holistic approach to corporate decision-making and balancing short-term financial goals and long-term sustainability objectives, banks can navigate the evolving landscape of responsible banking and contribute to positive societal impact while delivering value to shareholders.

Empirical Analysis of Financial Performance Determinants: ROA and ROE

Table 4 Regression Results of Dependent Variables ROA and ROE

	ROA (Auto)	ROE (Auto)
	(1)	(2)
lag(EPI)	-0.001	0.023
	(0.003)	(0.026)
SIZE	0.373	-0.771*
	(0.455)	(0.419)
NETL	0.858	-7.292
	(1.184)	(4.587)
BETA	-0.379***	-4.228***
	(0.101)	(0.980)
GDP	0.020**	0.350***
	(0.008)	(0.050)
INF	0.013	0.186**
	(0.012)	(0.091)
Model:	Fixed, Random	
Observations:	N=284	
R2:	0.168 (Fixed), 0.308 (Random)	
F Statistic:	6.959*** (df = 6; 207), 123.272***	

*Note: ***p < 0.01, **p < 0.05, *p < 0.1*

Table 4 provides the regression outcomes for two dependent variables, Return on Assets (ROA) and Return on Equity (ROE), with their corresponding independent variables. The coefficients for each variable are mentioned below:

ROA:

- Lag (EPI): Each unit increase in Lag (EPI) has a minor negative impact on ROA, and the coefficient is -0.001. However, the outcome is not statistically significant.
- SIZE: There is a positive correlation between SIZE and ROA, with a coefficient of 0.373. However, it is not statistically significant.
- NETL: Each unit increase in NETL positively influences ROA, and the coefficient is 0.858. However, it is not statistically significant.
- BETA: A higher beta is linked with a lower ROA, and the coefficient is -0.379, indicating a significant negative relationship between BETA and ROA.
- GDP: The correlation coefficient between GDP and ROA is 0.020, indicating a positive relationship. At the 5% level, the relationship is statistically significant.
- INF: Inflation positively affects ROA, but the coefficient is 0.013, which is not statistically significant.

ROE:

- Lag (EPI): Each unit increase in Lag (EPI) positively impacts ROE, and the coefficient is 0.023, but it is not statistically significant.
- SIZE: There is a negative correlation between SIZE and ROE, with a coefficient of -0.771. The connection is statistically significant at the 10% level.
- NETL: Each unit increase in NETL significantly negatively impacts ROE, and the coefficient is -7.292.
- BETA: A higher beta leads to a lower ROE; the coefficient is -4.228, indicating a significant negative relationship between BETA and ROE.
- GDP: There is a significant positive connection between GDP and ROE, and the coefficient is 0.350.
- INF: Inflation positively impacts ROE; the coefficient is 0.186, and the connection is statistically significant at the 5% level.

The R-squared value for the Fixed model for ROA is 0.168, which implies that the independent variables explain around 16.8% of the variance in ROA. The Random model for ROE has a higher R-squared value of 0.308, indicating that the

independent variables explain approximately 30.8% of the variance in ROE. Both models have statistically significant F Statistics, suggesting that the models are meaningful in explaining the variations in ROA and ROE.

This result offers valuable insights into the factors influencing ROA and ROE. Some variables, such as BETA and GDP, have statistically significant relationships with ROA and ROE, while others, such as SIZE, NETL, and INF, show mixed or insignificant effects. These findings can guide financial decision-making processes and investment strategies.

Results of Pillars

Within the Pillars analysis (Table 5.), a negative correlation between ROA and EPS suggests potential challenges for banks in prioritizing sustainability. However, no statistically significant relationship is identified between Governance Performance Score (GPS) or Social Performance Score (SPS) and ROA or ROE.

Results of the EPS Pillar Model

Table 5 Regression Results of Dependent Variable ROA

	ROA (Auto)
Lag (EPS)	-0.007** (0.003)
SIZE	0.476 (0.473)
NEIL	0.722 (1.137)
BETA	-0.322*** (0.092)
GDP	0.020** (0.008)
INF	0.018 (0.011)
Model:	Fixed
Observations:	N=284
R2:	0.187
F Statistic:	7.930*** (df = 6; 207)

Note: ***p < 0.01, **p < 0.05, *p < 0.1

The regression analysis in Table 5 displays the relationship between Return on Assets (ROA) and several independent factors. According to the results, if Lag (EPS) increases by one unit, ROA decreases by 0.007 units, ceteris paribus. The findings show that an increase in size is linked with a positive change in ROA for SIZE, but it did not present a statistically significant result at conventional levels. Similarly, NETL's coefficient implies that a one-unit increase in NETL leads to a positive change in ROA, but the result is not statistically significant. However, BETA's coefficient is statistically significant at the 1% level and indicates that an increase in beta is associated with a decrease in ROA. The coefficient for GDP is also statistically significant at the 5% level, indicating that an increase in GDP

leads to a positive change in ROA. Lastly, the coefficient of INF suggests that an increase in inflation leads to a positive change in ROA, but the result is not statistically significant.

These results provide significant insights into the factors affecting ROA. While beta and GDP have statistically significant relationships with ROA, other factors such as SIZE, NETL, and INF show mixed or insignificant effects. Financial professionals and investors can benefit from these findings when making informed financial decisions and investment strategies.

Asset Division

Although larger banks exhibit superior performance in ethical and sustainable practices compared to smaller counterparts, neither group has a significant correlation between EPI and performance metrics. This underscores the necessity for further research to elucidate this relationship fully (Table 6).

Descriptive Statistics of Division by Total Assets

Table 6 Comparison of Performance Metrics Between Lower and Higher Total Assets Groups

Metric	Lower Total Assets (Count)	Higher Total Assets (Count)
EPI	59.64	60.46
EPS	49.11	81.51
GPS	61.42	71.00
SPS	**62.70**	**78.22**

Metric	Lower Total Assets (%)	Higher Total Assets (%)
EPI	20.98%	23.84%
EPS	17.28%	28.66%
GPS	21.59%	25.00%
SPS	22.04%	27.50%

Table 6 presents the descriptive data for the performance metrics split according to total assets. The data reveals that companies with higher total assets perform better on all environmental and social metrics than those with lower total assets.

In the lower total assets group, the average scores for performance metrics such as the Environmental Performance Index (EPI), Environmental Performance Score (EPS), Governance Performance Score (GPS), and Social Performance Score

(SPS) are lower when compared to the higher total assets group. Specifically, companies with lower total assets have average scores of 59.64, 49.11, 61.42, and 62.70 for EPI, EPS, GPS, and SPS, respectively. On the other hand, the higher total assets group exhibits higher average scores across all metrics, with values of 60.46 for EPI, 81.51 for EPS, 71.00 for GPS, and 78.22 for SPS.

The distribution of performance metrics in percentages also shows that companies with higher total assets have a higher proportion of metrics. In the higher total assets group, EPI, EPS, GPS, and SPS account for 23.84%, 28.66%, 25.00%, and 27.50% of the total, respectively. In contrast, in the lower total assets group, EPI accounts for 20.98% of the total, while EPS, GPS, and SPS represent 17.28%, 21.59%, and 22.04%, respectively.

These findings suggest that companies with higher total assets exhibit better performance across environmental and social metrics than those with lower total assets. Such insights can be leveraged in strategic decision-making to improve organizational sustainability and performance.

Region Division

Surprisingly, Southern European banks exhibit higher EPI ratings than their Northern counterparts. Nonetheless, no statistically significant relationship is identified between EPI factors and regional performance metrics (Table 7).

Descriptive Statistics of EPI and its Pillars in European Regions

Table 7 Comparison of Performance Metrics Among Southern, Central, and Northern Regions

	Southern (Count)	Central (Count)	Northern (Count)
EPI	66.92	61.40	55.11
EPS	68.20	61.23	65.64
GPS	70.72	63.76	64.92
SPS	77.75	70.10	66.12

	Southern (%)	Central (%)	Northern (%)
EPI	33.46%	30.70%	35.83%
EPS	34.10%	30.62%	33.93%
GPS	35.36%	31.88%	33.75%
SPS	38.88%	35.05%	34.32%

Table 7 provides a comprehensive statistical analysis of the Environmental Performance Index (EPI) and its pillars across various European regions. They are comparing the average scores of the EPI and its three pillars, namely, Environmental Health (EPS), Ecosystem Vitality (GPS), and Social Well-being (SPS) across Southern, Central, and Northern regions. Our analysis shows that Southern regions outperform Central and Northern regions regarding overall environmental sustainability, with an average EPI score of 66.92 compared to Central (61.40) and Northern regions (55.11). Additionally, Southern regions perform better across different environmental dimensions, including environmental health, ecosystem vitality, and social well-being, with higher average scores in EPS (68.20), GPS (70.72), and SPS (77.75) compared to Central and Northern regions. This reveals significant regional disparities in environmental and social performance metrics, including EPI, EPS, GPS, and SPS. The table displays the average scores of these metrics in each region, highlighting the importance of recognizing regional variations in environmental and social sustainability efforts. These results highlight the necessity of focused actions to address particular regional issues and advance European regional sustainability.

Conclusion and Recommendation

Our study has revealed a complex and nuanced relationship between environmental performance and financial metrics. While specific EPI components are linked to financial indicators like return on assets (ROA) and return on equity (ROE), the connections are intricate and depend on various internal and external factors.

Our research underscores the importance of contextual factors, such as bank size and regional disparities, in shaping the efficacy of environmental performance initiatives. Larger banks may have more resources to invest in sustainability efforts, which could lead to different outcomes than those of smaller banks. Additionally, regional variations in regulatory frameworks and socio-economic conditions can significantly impact environmental performance and financial stability across different geographic regions.

Banks must integrate robust environmental performance practices to ensure long-term sustainability and value creation despite the complexities involved. By embracing environmentally responsible practices, banks can mitigate risks, improve their reputation, and foster stakeholder trust, ultimately leading to improved financial performance.

Going forward, banks must continue to prioritize environmental sustainability and integrate such considerations into their core business strategies. This requires measuring and monitoring environmental performance, incorporating sustainability principles into decision-making processes, and promoting collaboration across the industry.

By proactively embracing environmental stewardship and adopting sustainable banking practices, financial institutions can contribute to positive environmental outcomes while safeguarding long-term viability in an increasingly interconnected and environmentally conscious world.

Recommendations

The extensive study on the complex link between Ethical Success Indicators (EPIs) and financial success in European banks has yielded several strategic recommendations. These suggestions are professionally designed to help banks navigate the problematic environment of responsible banking while supporting long-term profit generation.

Tailored Implementation of Sustainable Practices

One of the most important recommendations is targeting sustainable banking operations practices. Personalizing sustainability efforts becomes critical as banks attempt to maintain ethical standards while mitigating environmental and social risks. By connecting these programs with corporate goals and values, banks may successfully handle geographical variances, regulatory constraints, and stakeholder expectations, increasing their resilience and competitive advantage in the market.

Strategic Addressal of Regional Disparities

Furthermore, banks must handle regional differences in environmental and social performance measures. Recognizing the various economic, cultural, and regulatory contexts between regions is critical. Banks may carefully examine these trends and modify their Ethical Performance Indicator (EPI) strategies to address specific difficulties while capitalizing on new possibilities, maximizing their effect on sustainability results.

Adoption of a Long-Term Perspective

Furthermore, banks should maintain a long-term perspective when incorporating ethical standards into their operations. Banks must stay committed to ethical ideals regardless of the short-term problems involved with sustainability projects. Emphasizing the long-term benefits of ethical practices, such as improved reputation, stakeholder trust, and risk reduction, helps establish a solid basis for long-term development and value generation.

Pursuit of Further Research Endeavors

Finally, given the complexities of the link between EPIs and financial success, there is a strong need for ongoing investigation. Future research should examine additional factors impacting bank performance and the changing influence of EPIs over time. Banks may improve their understanding of responsible banking practices by undertaking longitudinal studies and pursuing new research pathways, resulting in long-term, sustainable value creation.

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