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ESG Risk and Financial Performance of the U.S. Banks

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ABSTRACT

This study examines the relationship of ESG risk score with the financial performance of 122 American banks for the year 2022. Cross-sectional regression analysis is applied. Financial performance is computed as the Return on Assets (ROA) and Return on Equity (ROE). The explanatory variables used are the ESG Risk Scores of banks calculated by Morningstar Sustainalytics, the size of banks, the leverage ratio, i.e., total liabilities to total assets, the liquidity ratio, i.e., current assets to current liabilities, the efficiency ratio, i.e., total revenue to total assets, and the revenue per employee. The results provide evidence of a negative relationship between financial performance and ESG risk score. On the other explanatory variables, size has no impact on performance. Interestingly enough, the impact of leverage on ROA is slightly negative but the impact on ROE is clearly positive. Liquidity is positively related to performance. The impact of efficiency and revenue per employee is positive too.

KEYWORDS: *Financial Performance, ESG Risk, Efficiency, American Banks*

JEL Classification Codes: G21

INTRODUCTION

Nowadays, the value of banks is defined not only by their innovations, products and services but also by their willingness and ability to adopt effective environmental, social and governance (ESG) policies. The role of banks towards a socially responsible way of conducting business and a carbon-free world is crucial. In this respect, over 300 signatory banks have endorsed the United Nations (UN) Principles for Responsible Banking to accelerate a positive global transition for communities and the planet.

ESG in banking refers to the consideration of the environmental, social and governance aspects of the banking business. According to this principle, banks constantly need to evaluate the impact of their decisions and actions on the environment and society. As ESG-compliant practices are fast transitioning from voluntary to mandatory, banks need to prioritize their investments to ensure sustainable growth. ESG-compliant practices also entail that certain relevant risks need to be addressed. Such risks include pivotal operations such as the customer onboarding process, the data handling process, fraud detection, anti-money laundering safeguards, customer accounting, lending of funds and regulatory compliance. Overall, every bank is responsible for protecting the environment, contributing towards a diverse society and implementing robust governance.

ESG is important for banks not only for environmental and social reasons. Acknowledging the significance of ESG is vital for banks seeking to enhance both their sustainability and financial performance and attract potential clients and investors. To do so, banks have been investing in ESG-aligned infrastructures and processes. These investments are a practical demonstration of banks' commitment to high ESG standards. This commitment is usually awarded with ESG scores by the relevant rating agencies and helps banks gain the trust of new customers and possibly ensure cheap financing of their operations.

In fact, market trends show that investors prioritize banks that abide by ESG rules and, thus, banks that demonstrate a strong commitment to ESG principles stand out as desirable investment options for investors seeking sustainable and responsible opportunities. Overall, ESG-compliant banks are proven to be less vulnerable and more stable, and the commitment to reducing the footprint of banking operations can help banks deal with urgent societal challenges that demand new resilient solutions.

In this paper, we examine the relationship between the ESG risk scores and the financial performance of the American banks in 2022. Financial performance is measured as the Return on Assets (ROA) and Return on Equity (ROE), respectively. The ESG risk scores considered in our examination are those computed by Morningstar Sustainalytics.

Our study employs a sample of 122 banks which are among the biggest banks in the United States in terms of total assets as at 31 December 2022. Cross sectional regression analysis

is applied. Along with ESG risk scores, other explanatory variables used in our study are the size of banks, the leverage ratio, i.e., total liabilities to total assets, the liquidity ratio, i.e., current assets to current liabilities, the efficiency ratio, i.e., total revenue to total assets, and the revenue per employee.

Our empirical results indicate that there is a negative relationship between financial performance and ESG risk score. This negative relationship is quite strong in the case of ROE but less strong in the case of ROA. Going further, the size of banks has no impact on their financial performance. The relationship of financial performance with leverage is not of one sign. In particular, the impact of leverage on ROA is slightly negative but the impact on ROE is positive and very strong. Liquidity is positively related to performance. A positive relationship of performance with efficiency and revenue per employee is revealed too.

The main contribution of our study is that it provides new insights on the relationship of ESG risk score with the financial performance for a large sample of American banks with the most recent data that are publicly available. In addition, the results of our regression analysis can form an effective selection tool for investors trying to detect banks with the highest financial performance, which may reward them with higher dividends and, possibly, higher stock returns.

The rest of the paper is structured as follows: Next section discusses the main findings of international literature on the relationship between ESG performance and financial performance. Section three concerns the methodological approach and the sample of our study. Section 4 provides an analysis of ESG risk scores of the examined banks. Section 5 presents the empirical findings of our study. Finally, section 6 summarizes the conclusions of our study and offers some suggestions for future research on the subject.

LITERATURE REVIEW

Simpson and Kohers (2002), using data from the banking sector in the United States, find that there is a positive linkage between social and financial performance. By focusing on the governance factor of the ESG performance, Peni and Vähämaa (2012) examine the impact of corporate governance on the financial performance of large publicly traded U.S. banks during the crisis of 2008. The empirical results are mixed. In particular, banks with stronger corporate governance mechanisms showed higher profitability in 2008. However, these banks experienced negative effects on their stock market values during the crisis.

Ersoy *et al*. (2022) examine the impact of the ESG and ESG pillar scores on the market value of U.S. commercial banks by using linear and non-linear panel regression models over the period 2016-2020. Results show an inverted U-shaped relationship between market value and ESG and the Social Pillar Score (SPS) and a U-shaped relationship between market value and the Environment Pillar Score (EPS).

Jo *et al*. (2015) examine whether corporate environmental

responsibility (CER) can enhance financial performance in the financial services sector of 29 countries. The authors suggest that by effectively investing in CER, executives can decrease the environmental costs of their organizations, thereby enhancing operating performance. However, the reduction in environmental costs takes at least one or two years before enhancing return on assets. In addition, the reduction in environmental costs has a more immediate and substantial effect on performance in developed financial markets than in less-developed markets.

Brogi and Lagasio (2019) assess the relationship between the ESG performance and financial performance of the American companies by comparing industrial to banking and insurance companies. The results indicate that the ESG policies are positively related to profitability for both financial and non-financial companies. However, for industrial companies, the positive effect on profitability gradually slows during the years. On the contrary, the positive effect on the profitability of banks is robust and, therefore, banks should keep focusing on risks and opportunities from implementing ESG practices to move to a more sustainable business structure.

Miralles-Quirós *et al*. (2019) study the role of socially responsible activities on shareholder value creation in a sample of 166 banks from 31 countries over the 2010-2015 period. The results reveal that there is no homogeneity in the value relevance of the ESG practices adopted by the examined banks. In particular, the environmental and corporate governance performance of banks is positively related to Tobin's Q and, therefore, to shareholder value creation. On the other hand, there exists a negative and significant correlation of banks' social performance with shareholder value creation.

Shakil *et al*. (2019) explore the effects of ESG performance on banks' financial performance for a sample of 93 banks from emerging markets during the period 2015-2018. The findings indicate a positive association of emerging market banks' environmental and social performance with their financial performance. On the other hand, the governance factor does not affect financial performance.

Koapaha (2023) studies the link between net interest income, ESG performance and bank performance using a multiple regression analysis on a panel dataset of publicly traded banks in the United States. ESG performance is found to be a significant predictor of bank performance, while net interest income has a mixed relationship with bank performance.

In regard to the impact of net interest income on financial performance, several other studies offer mixed results. Studies such as those by Athanasoglou *et al*. (2008) and Dietrich and Wanzenried (2011) reveal a positive relationship between net interest income and financial performance. However, other studies such as those by Albertazzi and (2009) and Bolt *et al*. (2012) report a negative or non-significant relationship between net interest income and financial performance in the banking sector.

Soana (2011) investigates the connection between social and

financial performance in the banking sector with a sample of 21 international banks and 16 Italian banks applying correlation analysis. The empirical findings show that there is no statistically significant linkage, neither positive nor negative, between social and financial performance.

Wu and Shen (2013) assess the link between CSR and financial performance and discuss the motivation of banks to engage in CSR. They use data from a sample of 162 banks in 22 countries and cover the period 2003-2009. The empirical results show that CSR positively associates with financial performance, when financial performance is measured as ROA, ROE, net interest income and non-interest income.

In a similar international set, Esteban-Sanchez *et al.* (2017) employ data for a sample of 154 financial institutions in 22 countries during the period 2005-2010 to examine the relationship between corporate performance and corporate responsibility. The results show that banks with better employee relationships and corporate governance have better financial performance. In addition, it is found that during the crisis, better relations with the community could be valued positively by investors, which, in turn, could increase corporate financial performance.

Simsek and Cankaya (2021) examine the relationship between the ESG scores and financial performances of banking institutions operating in the G-8 countries, namely, Italy, France, Japan, Canada, Russia, the UK and the US. The financial performance of banks is measured as ROA and ROE. The results show that the environmental score has a negative and significant relationship with both performance measures, while the social score has a positive and significant relationship with the two performance measures.

Dragomir *et al.* (2022) examine the influence of ESG performance on the financial performance of 333 banks located in 53 countries in Europe, America, and Asia, before and during the Covid-19 pandemic of 2019-2021. The findings indicate that the banks' environmental performance in 2019 had a negative influence on the return on equity during 2020, while no other ESG factors were significant.

Finally, about Africa, Siueia *et al.* (2019) examine the impact of voluntary CSR disclosure on financial performance, i.e., ROA and ROE, in the Sub-Saharan banking sector by comparing the top-ranked banks in Mozambique and the Republic of South Africa. Based on a panel data covering the period 2012-2016, the authors regress financial performance on CSR disclosures and found a significant and positive relationship between these factors suggesting that CSR behavior is helpful to improve the performance of banks.

RESEARCH METHODOLOGY

In this section, we describe the research methodology we apply to assess the relationship of ESG risk scores with the financial performance of the American banks.

Correlation Analysis

In the first step, we apply simple correlation analysis, based on the Pearson's correlation coefficient, of the key variables that are used in our study. These variables are financial performance, i.e., Return on Assets calculated as the fraction of earnings before interest and tax to total assets, and Return on Equity computed as the ratio of earnings before interest and tax to total equity, the ESG risk score computed by Morningstar Sustainalytics, the size of banks measured as the natural logarithm of total assets at the end of 2022, the leverage ratio, that is, total liabilities to total assets, the liquidity of banks computed as the ratio of current assets to current liabilities, the efficiency ratio, which is computed as the fraction of total revenue for 2022 to total assets as at 31/12/2022, and the revenue per employee for the year 2022.

The main benefit of correlation analysis is that it helps determine which variables one wants to investigate further, and it allows for rapid hypothesis testing. Such an analysis is primarily concerned with finding out whether a relationship exists between variables and then determining the magnitude and sign of that relationship.

Correlation does not entail causation. That means that correlation analysis identities and evaluates a relationship between two variables, but a positive correlation does not automatically mean that one variable affects the other. This type of correlation only reflects a linear correlation of variables and ignores non-linear types of relationships or correlations.

Regression Analysis of Financial Performance

In the first step, we run the following single-factor cross-sectional regression model on the relationship between financial performance and ESG risk score:

$$Pnce = \beta_0 + \beta_1 ESGrsk + u \qquad (1)$$

where Pnce stands for ROA or ROE and ESGrsk is the most recent Morningstar's ESG risk score publicly available.

Several studies have accentuated that there is a positive relationship between the ESG performance and financial performance for banks. In our case, ESG performance is approached in a negative way, that is, the highest the ESG risk score of a bank, the lower its ESG performance. Therefore, if the findings of the literature apply to our sample, the ESGrsk coefficient will be negative and statistically significant.

In the second step, along with ESG risk score, we consider four additional control variables. The first one is the size of banks. The second control variable is the leverage ratio. Next is the liquidity ratio and the fourth variable is the efficiency ratio. In an alternative version, we replace the efficiency ratio with the revenue per employee, which is another measure of banks' efficiency. The multivariate cross-sectional model we run is shown in the following equation:

$$Pnce = \beta_0 + \beta_1 ESGrsk + \beta_2 Size + \beta_3 Leverage + \beta_4 Liguidity + \beta_5 Efficiency/(Revenue\ per\ Employee) + u \qquad (2)$$

where all variables are defined as above.

Size is frequently considered to be positively related to firm performance. If this is true in our case, the coefficient of size will be positive and significant. With respect to leverage, there are studies that report a negative impact of this factor on firm performance (e.g., Yameen *et al.*, 2019). If this is the case for our sample too, the coefficient of leverage must be negative. According to Zygmunt (2013), the importance of liquidity for the financial performance of a company might determine its level of profitability and, consequently, its financial performance. Based on this analysis, the coefficient of the liquidity ratio in model (2) should be positive. Efficiency is positively related to corporate financial performance

(Khan *et al.*, 2021). If this is the case for our sample too, the estimate of the efficiency ratio in model (2) is expected to be positive.

Sample

Our sample includes 122 of the biggest U.S banks based on their assets as at 31 December 2022.[1] Total assets held by these 122 banks at the end of 2022 amounted to 16.7 trillion USD. At the same date, the total assets of the entire banking industry in the U.S. amounted to 23.6 trillion USD.[2] Based on assets, our sample covers 71% of the entire banking industry, thus, being quite representative of the whole market.

Table 1. Accounting Data

This table presents accounting data of the sample's US banks for the year 2022. Data presented include total assets, current assets, equity, equity to assets ratio, total liabilities, current liabilities, total revenue, number of employees, revenue per employee and earnings before interest and tax (EBIT). Data are presented in five clusters, which have been prepared by descending the assets of banks, and for the entire sample.

	Total Assets	Current Assets	Equity	Equity to Assets	Total Liabilities	Current Liabilities	Total Revenue	Employees	Revenue per Empoyee	EBIT
Cluster 1: Top Size Companies										
Average	602,512,574,840	239,235,670,800	52,033,091,920	8.58	550,479,482,920	473,495,516,560	26,446,180,680	54,716	595,034	10,967,361,680
Median	207,452,000,000	95,876,000,000	17,731,000,000	8.36	190,125,000,000	157,752,000,000	12,199,000,000	20,200	486,502	3,456,000,000
Min	64,112,150,000	10,203,000,000	3,613,000,000	2.28	58,127,538,000	2,443,000,000	2,619,897,000	3,200	307,105	909,876,000
Max	3,665,743,000,000	1,731,506,000,000	292,332,000,000	11.68	3,373,411,000,000	2,886,960,000,000	122,306,000,000	300,066	1,264,131	72,263,000,000
Count	25	25	25	25	25	25	25	25	25	25
Cluster 2: Secod Top Size Companies										
Average	35,370,211,792	9,418,561,500	3,639,312,167	10.33	31,730,899,625	30,803,344,542	1,526,530,667	3,595	440,199	566,958,333
Median	33,735,812,500	9,176,268,000	3,135,600,000	10.43	30,200,547,500	29,927,503,000	1,367,854,500	3,669	412,250	530,951,500
Min	21,947,976,000	2,753,056,000	1,316,995,000	5.58	19,473,936,000	19,015,251,000	754,907,000	1,178	282,093	265,194,000
Max	59,731,378,000	17,964,207,000	6,699,374,000	17.78	55,255,577,000	49,621,531,000	4,391,439,000	9,000	818,578	1,086,503,000
Count	24	24	24	24	24	24	24	24	24	24
Cluster 3: Medium Size Companies										
Average	15,486,039,833	3,614,757,458	1,612,163,792	10.39	13,873,876,042	13,536,151,125	621,289,917	1,649	459,313	240,482,583
Median	13,973,221,500	3,395,610,000	1,487,627,000	10.55	12,485,594,500	12,064,045,500	593,126,500	1,484	345,961	239,113,000
Min	11,150,854,000	1,707,394,000	954,062,000	6.71	9,922,533,000	9,723,283,000	446,585,000	496	213,036	91,803,000
Max	21,688,017,000	7,042,125,000	2,798,389,000	13.24	19,493,151,000	19,311,199,000	917,645,000	3,500	1,379,917	415,731,000
Count	24	24	24	24	24	24	24	24	24	24
Cluster 4: Second Bottom Size Companies										
Average	9,026,395,792	1,670,653,500	904,390,917	9.99	8,122,004,875	7,884,937,125	399,093,875	914	482,475	153,551,292
Median	9,156,820,000	1,518,123,500	954,780,500	10.32	8,215,554,500	8,013,233,000	377,589,500	888	457,045	145,375,000
Min	7,843,124,000	863,691,000	508,822,000	6.00	6,815,453,000	6,395,172,000	262,613,000	256	280,478	89,441,000
Max	10,783,840,000	3,514,119,000	1,184,659,000	14.59	9,675,253,000	9,321,268,000	919,890,000	1,632	1,025,832	235,552,000
Count	24	24	24	24	24	24	24	24	24	24
Cluster 5: Bottom Size Companies										
Average	6,257,854,600	1,666,195,400	589,065,240	9.67	5,668,789,360	5,496,218,520	298,245,920	830	404,462	109,872,240
Median	6,660,051,000	1,404,510,000	602,110,000	9.31	6,102,240,000	5,992,487,000	280,575,000	803	339,425	104,093,000
Min	1,724,987,000	489,439,000	298,140,000	6.09	1,416,354,000	33,795,000	116,686,000	239	232,260	44,954,000
Max	7,670,686,000	5,541,892,000	856,613,000	17.89	7,054,708,000	6,949,873,000	606,003,000	1,991	1,202,226	191,690,000
Count	25	25	25	25	25	25	25	25	25	25
Total Sample										
Average	136,528,231,754	52,257,721,262	11,994,219,131	9.78	124,534,012,623	108,427,702,984	5,981,447,639	12,594	476,681	2,458,972,631
Median	13,973,221,500	3,395,610,000	1,470,100,000	9.80	12,485,594,500	11,929,473,500	665,144,500	1,592	405,412	239,113,000
Min	1,724,987,000	489,439,000	298,140,000	2.28	1,416,354,000	33,795,000	116,686,000	239	213,036	44,954,000
Max	3,665,743,000,000	1,731,506,000,000	292,332,000,000	17.89	3,373,411,000,000	2,886,960,000,000	122,306,000,000	300,066	1,379,917	72,263,000,000
Count	122	122	122	122	122	122	122	122	122	122

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1 Rerer to https://www.mx.com/blog/biggest-banks-by-asset-size-united-states/ for a report on the assets of the 250 largest listed banks in the U.S at the end of 2022.
2 Refer to https://ycharts.com/indicators/us_banks_total_assets.

Table 1 provides basic accounting figures of the examined banks for 2022. The reported figures are total assets, current assets, equity, total liabilities, current liabilities, total revenue, number of employees, revenue per employee and earnings before interest and tax (EBIT) as at 31/12/2022. An equity to assets ratio is reported too. Data are presented in five clusters, which have been prepared by descending the assets of banks, and for the entire sample. These data have been collected manually from Nasdaq.com.

At the balance sheet level, average assets amount to 137 billion dollars, with the largest bank in the sample presenting assets of 3.7 trillion dollars. This is the banking giant JPMorgan Chase Bank, which is classified as a bank of medium risk from an ESG perspective. On the other hand, the smallest bank in the sample is the Regions Bank, which is headquartered in the Regions Center in Birmingham, Alabama, a bank of medium ESG risk. Average current assets amount to 52 billion dollars, which captures 38% of total assets.

Going further, the average equity in the sample approximates 12 billion dollars. The minimum and maximum equity figures amount to 0.3 and 292 billion dollars, respectively. Compared to total assets, equity figures are rather low. In fact, the average equity to assets ratio in the sample is just 9.78%. This percentage shows that the average American bank relies heavily on external resources for financing its operations. Going further, average total liabilities amount to 125 billion dollars with the maximum total liabilities figure exceeding 3.3 trillion dollars. Average current liabilities amount to 108 billion dollars or 87% of total liabilities. Such a high portion of current relative to total liabilities could trigger liquidity issues for the American Banks.

At the profit and loss statement level, average total revenue approximate 6 billion dollars. The maximum total revenue figure is 122.3 billion dollars and has been achieved by the JPMorgan Chase Bank. The lowest revenue of 116.7 million dollars is presented by the Farmers and Merchants Bank of Long Beach in California. The average number of employees per bank is 12.594, each of whom achieved an average revenue of 476.7 thousand dollars in 2022.

When it comes to profitability, the average EBIT in the sample amounts to 2.5 billion dollars. The worst profitability measure is 45 million dollars (achieved by Farmers and Merchants Bank of Long Beach). On the other hand, the maximum EBIT of the sample for 2022 was 72.2 billion dollars. JPMorgan Chase Bank reached this maximum profitability level.

Table 2. Financial Ratios

This table presents key financial ratios of the sample's US banks for the year 2022. The ratios presented are the leverage ratio, liquidity ratio, efficiency ratio, Return on Assets (ROA), and Return on Equity (ROE). Data are presented in five clusters, which have been prepared by descending the assets of banks, and for the entire sample.

	Leverage	Liquidity	Efficiency	Return on Assets	Return on Equity
Cluster 1: Top Size Companies					
Average	91.42	83.60	5.78	1.92	25.02
Median	91.64	34.92	4.38	1.71	21.84
Min	88.32	17.02	3.10	1.15	11.29
Max	97.72	1,028.45	24.36	4.74	95.65
Count	25	25	25	25	25
Cluster 2: Secod Top Size Companies					
Average	89.67	31.25	4.29	1.61	16.26
Median	89.57	32.67	3.96	1.48	15.34
Min	82.22	12.82	3.20	0.89	9.36
Max	94.42	49.02	11.81	2.92	26.72
Count	24	24	24	24	24
Cluster 3: Medium Size Companies					
Average	89.61	26.80	4.02	1.56	15.25
Median	89.45	26.51	3.99	1.58	15.06
Min	86.76	14.25	3.47	0.51	6.15
Max	93.29	49.73	4.87	2.20	23.29
Count	24	24	24	24	24
Cluster 4: Second Bottom Size Companies					
Average	90.01	21.33	4.46	1.72	17.54
Median	89.68	18.69	3.99	1.63	17.07
Min	85.41	11.75	3.14	0.93	8.19
Max	94.00	48.98	11.53	2.95	26.83
Count	24	24	24	24	24
Cluster 5: Bottom Size Companies					
Average	90.33	201.98	5.50	1.87	19.29
Median	90.69	25.54	4.31	1.66	17.59
Min	82.11	12.72	3.43	1.25	12.63
Max	93.91	4,359.99	29.40	5.77	32.25
Count	25	25	25	25	25
Total Sample					
Average	90.22	74.14	4.82	1.74	18.73
Median	90.20	26.67	4.06	1.61	17.04
Min	82.11	11.75	3.10	0.51	6.15
Max	97.72	4,359.99	29.40	5.77	95.65
Count	122	122	122	122	122

Leverage Ratio: Total Liabilities/Total Assets
Liquidity Ratio: Current Liabilities/Current Assets
Efficiency Ratio: Total Revenue/Total Assets
ROA: Return on Assets=Earnings Before Interest and Tax/Total Assets
ROE: Return on Equity=Earnings Before Interest and Tax/Total Equity

Table 2 presents key financial ratios of the samples' banks, that is, the leverage liquidity and the efficiency ratios, along with the return on assets and the return on equity. The average leverage ratio is 90.22%. The minimum and maximum leverage ratios of the sample are 82.11% and 97.72%, respectively. These leverage ratios verify our conclusion above about the strong dependence of the banks in the United States on external financing. The average liquidity ratio is 74.14%, that is below 100%. This means that the current assets of banks are not enough to repay their current liabilities. This is another indicator of possible liquidity issues for the American banks.

The average efficiency ratio is rather low at 4.82%. The minimum efficiency is 3.10% (achieved by Goldman Sachs Bank USA) and the maximum efficiency ratio is equal to 29.40 (presented by the Regions Bank).

As far as the financial performance of the examined banks is concerned, the average ROA in the sample is 1.74%. The minimum ROA is equal to 0.51% and the maximum ROA is equal to 5.77% (achieved by the Regions Bank). The average ROE is 18.73%, with extreme ROE scores amounting to 6.15% and 95.65%. These minimum and maximum ROE ratios are presented by the Trustmark National Bank and the Ameriprise Bank (FSB), respectively.

ESG RISK ANALYSIS

Table 3 provides information on the ESG performance of the American banks. The average ESG risk score in the sample is 27.6. This term shows that, on average, the examined banks are of medium ESG risk. In fact, 81 (or 66%) of the banks under study are included in the medium ESG risk cluster. 6 (5%) banks are of low ESG risk, and 35 (29%) banks are of high ESG risk. There are no banks with negligible or severe ESG risk in the sample.[3]

Table 3. ESG Risk Scores

This table presents the Morningstar Sustainalytics' ESG Risk Scores for the five clusters considered in our analysis for the year 2022.

	ESG Risk Score	Low ESG Risk	Medium ESG Risk	High ESG Risk
Cluster 1: Top Size Companies				
Average	23.9			
Median	23.5			
Min	16.8			
Max	36.2			
Count	25	4	19	2
Percentage	100%	16%	76%	8%
Cluster 2: Secod Top Size Companies				
Average	27.1			
Median	26.8			
Min	21.2			
Max	32.3			
Count	24	0	20	4
Percentage	100%	0%	83%	17%
Cluster 3: Medium Size Companies				
Average	27.9			
Median	28.0			
Min	17.7			
Max	35.4			
Count	24	1	18	5
Percentage	100%	4%	75%	21%
Cluster 4: Second Bottom Size Companies				
Average	30.0			
Median	30.7			
Min	14.5			
Max	37.6			
Count	24	1	8	15
Percentage	100%	4%	33%	63%
Cluster 5: Bottom Size Companies				
Average	29.1			
Median	29.2			
Min	21.5			
Max	34.1			
Count	25	0	16	9
Percentage	100%	0%	64%	36%
Total Sample				
Average	27.6			
Median	28.0			
Min	14.5			
Max	37.6			
Count	122	6	81	35
Percentage	100%	5%	66%	29%

3 Morningstar Sustainalytics considers five categories of ESG risk, namely, negligible ESG risk ranging from 0 to 9.9, low ESG risk ranging from 10 to 19.9, medium ESG risk ranging from 20 to 29.9, high ESG risk ranging from 30 to 39.9 and severe ESG risk being equal to 30 or higher.

Table 3 also reports the number of banks from each ESG risk category included in the five asset clusters considered in our study. In the top size cluster, the average ESG risk score is equal to 23.9, being lower than the sample's average. 4 (16%), 19 (76%), and 2 (8%) banks are characterized of low, medium and high ESG risk, respectively. In the second top size cluster, the average ESG risk score is 27.1. 83% of banks in this cluster are of medium ESG risk. In the medium size cluster, the average ESG risk score is 27.9, approximating the sample's average of 27.6. One bank presents a low ESG risk profile, 18 out of 24 banks are of medium ESG risk, and 5 banks are highly risky from an ESG perspective. Going further, in the second bottom size cluster, the average ESG risk score is equal to 30. In this cluster, the majority of banks (63%) are of high ESG risk. Finally, the average ESG risk score in the bottom size cluster is 29.1. In this cluster, 64% and 36% of banks present medium and high ESG risk scores, respectively.

The per size cluster analysis of ESG risk scores entails that, probably, there is a negative relationship between the ESG risk scores of the American banks and the magnitude of their assets. By descending from the top to the bottom cluster, we note that the average ESG risk score increases from the top to the bottom cluster, with the exception of the fifth cluster whose average ESG risk score is slightly lower than that of the fourth cluster (29.1 vs 30).[4]

To confirm whether there is a statistically significant negative relationship between ESG risk score and the size of banks, we run a simple regression of the sample's ESG risks scores to the natural logarithm of assets. The model produced a slope of -1.10, which is statistically significant at 1%, verifying the significance of the negative impact exerted by the size of banks on their ESG risk scores. Based on our findings, size could serve as a selection tool for investors wishing to avoid banks with high ESG risk potential.

EMPIRICAL RESULTS

The results of our empirical analysis are reported in this section. We first discuss the correlation coefficients among the key variables considered in our study and then we present the results of the regression analysis on the financial performance of the American banks.

Correlation Analysis

Table 4 presents the correlation coefficients among ROA, ROE, the ESG risk score, the size of banks, the leverage, liquidity and efficiency ratios, and the revenue per employee for 2022. According to the correlation figures, ROA is negatively related to the ESG risk score. This is also the case for ROE, with the relevant correlation coefficient being higher than that for ROA (in absolute terms). ROA is not related to size (zero correlation coefficient between these variables). ROE's correlation with size is positive at 0.20. ROA's correlation with leverage is negative. The opposite is the case for ROE. The correlation coefficients of ROA and ROE with the rest variables considered, i.e., liquidity, efficiency and revenue per employee are all positive.

Table 4. Correlations

This table presents the correlations of the key variables that are used in our analysis for the year 2022.

	ROA	ROE	ESG Risk	Size	Leverage	Liquidity	Efficiency	Revenue per Employee
ROA	1.00	0.49	-0.20	0.00	-0.32	0.61	0.87	0.22
ROE	0.49	1.00	-0.32	0.20	0.47	0.32	0.41	0.38
ESG Risk	-0.20	-0.32	1.00	-0.39	-0.19	-0.18	-0.24	-0.11
Size	0.00	0.20	-0.39	1.00	0.21	-0.11	-0.01	0.22
Leverage	-0.32	0.47	-0.19	0.21	1.00	-0.24	-0.31	0.21
Liquidity	0.61	0.32	-0.18	-0.11	-0.24	1.00	0.70	-0.08
Efficiency	0.87	0.41	-0.24	-0.01	-0.31	0.70	1.00	0.12
Revenue per Employee	0.22	0.38	-0.11	0.22	0.21	-0.08	0.12	1.00

The correlation coefficients entail that the variables we have chosen to use in our analysis have some sort of relationship with the financial performance of the American banks. However, whether these linear relationships can be interpreted as if the selected variables can explain or affect financial performance will be answered via the results of the regression analysis that follow in the next section.

Regression Analysis of Financial Performance

The results of models (1) and (2) on bank's financial performance are provided in Tables 5 and 6. Table 5 concerns ROA and Table 6 regards ROE. The coefficients of variables, t-statistics on their statistical significance and R-squared are presented in the tables.

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4 The results of the model are not reported in the paper but are available upon request.

Table 5. Regression Analysis of Return on Assets

This table presents the results of cross-sectional regression analysis of the US banks' financial performance expressed in Return on Assets (ROA) terms. In this analysis, the various explanatory variables considered are the ESG Risk Scores of the banks, size, i.e., the natural logarithm of assets, leverage ratio, liquidity ratio, efficiency ratio and the revenue per employee in logarithmic terms.

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	2.51[a]	4.64	2.14	1.59	2.50	1.18
ESG Risk Score	-0.03[c]	-1.74	0.00	0.15	-0.02[c]	1.69
Size			0.01	0.54	0.00	0.16
Leverage			-0.02	-1.22	-0.07[a]	-3.87
Liquidity			0.00	0.14	0.10[a]	7.92
Efficiency			0.16[a]	12.94		
Revenue per Employee					0.47[a]	4.47
R-squared	0.14		0.77		0.51	
a Statistically Significant at 1%; Statistically Significant at 5%; Statistically Significant at 10%.						

Table 6. Regression Analysis of Return on Equity

This table presents the results of cross-sectional regression analysis of the US banks' financial performance expressed in Return on Equity (ROE) terms. In this analysis, the various explanatory variables considered are the ESG Risk Scores of the banks, size, i.e., the natural logarithm of assets, leverage ratio, liquidity ratio, efficiency ratio and the revenue per employee in logarithmic terms.

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Constant	37.49[a]	4.43	-227.68[a]	-2.97	-247.40[a]	-2.95
ESG Risk Score	-0.68[b]	-2.40	-0.05	-0.38	-0.20[c]	-1.87
Size			0.47	1.15	0.29	0.82
Leverage			2.54[a]	3.25	1.95[a]	2.89
Liquidity			0.00	0.61	0.09[b]	2.49
Efficiency			1.43[a]	10.05		
Revenue per Employee					6.74[a]	3.25
R-squared	0.12		0.57		0.52	
a Statistically Significant at 1%; Statistically Significant at 5%; Statistically Significant at 10%.						

In the case of ROA, the single-factor model (1) produces a slightly negative but significant estimate for the ESG risk score (i.e., -0.02). The coefficient of ESG risk score obtained from model (2) is insignificant when the efficiency ratio is included in the independent variables. However, when we use revenue per employee instead of the efficiency ratio, the coefficient of model (2) concerning ESG risk score is equal to that of the single-factor model, being statistically significant too.

On the other explanatory variables, size bears no influence on ROA. Leverage offers slightly negative estimates and significant in the second version of model (2). Liquidity is positively related to ROA. However, liquidity's estimate is significant only in the second version of the applied model. Finally, the efficiency and revenue per employee factors present positive and statistically significant estimates, with the impact of the latter being quite high at 0.47.

In regard to ROE, the results in Table 6 are quite strong. Model (1) produces a negative and statistically (and economically) significant estimate for the ESG risk score that is equal to -0.68. This is also the case for the corresponding coefficient obtained from the second version of model (2). Similar to the results on ROA, the estimate of the size factor is immaterial, while, contrary to the results on ROA, the leverage ratio presents positive and significant estimates, ranging from 1.95 to 2.54 in the second and the first versions of the model, respectively. Similar to the case of ROA, liquidity is significantly positive only in the second version of model (2), while efficiency and revenue per employee present positive and very estimates, being equal to 1.43 and 6.74, respectively.

In sum, the empirical findings of our regression analysis reveal that financial performance is negatively related to ESG risk score, with this relationship being less significant in the case of ROA. Moreover, the size of banks does not seem to exert any impact on financial performance (but it can affect the ESG risk scores of the American banks as we saw in the previous section). Interestingly enough, the leverage of banks is quite significant in explaining their financial

performance. However, the sign of the leverage's impact on financial performance is not unambiguous, as it is negative in the case of ROA but positive in the case of ROE. Finally, liquidity, efficiency and revenue per employee affect financial performance in a positive fashion, even though the magnitude of each variable's influence on performance varies.

CONCLUSION

In this study, we examine the relationship between the ESG risk score and financial performance using data of a sample of 122 U.S. banks. The study covers 2022. Two alternative versions of financial performance are considered, i.e., return on assets and return on equity. Along with ESG risk scores, we use the size of banks, their leverage, liquidity and efficiency ratios, and the revenue per employee as explanatory variables of financial performance. From a methodological perspective, correlation analysis and cross-sectional regression analysis are applied.

The empirical results revealed a negative relationship between ESG risk scores and financial performance. This finding is in line with that strand of literature which says that the higher the ESG performance of a corporation, the better its financial performance. On the other hand, the size of banks does not affect their financial performance, but it can affect their ESG performance. In particular, we found size to be negatively and significantly related to the ESG risk scores of the U.S. banks.

Going further, leverage is found to be important for the financial performance of banks. However, leverage does not affect the alternative forms of financial performance in the same way. More specifically, the effect of leverage on return on assets is negative but this effect becomes positive in the case of the return on equity. The impact of liquidity, efficiency and revenue per employee on banks' performance is positive.

Overall, our study provides strong evidence that supports the idea about a positive impact of ESG performance on corporate financial performance in the banking sector. Therefore, the American banks, and especially those which at the moment adopt poor ESG practices, as evidenced by a high ESG risk score, need to keep on working towards enhancing their social and environmental positive footprint and improving their governance practices to their own and the general good.

From a practical point of view, our results can serve as an efficient selection tool for investors and other ESG concerned stakeholders. The important role of variables such as the leverage, liquidity and efficiency ratios or the revenue per employee can serve as indicators for future performance and can help focus on banks with the highest financial performance, which may reward investors with higher dividends and, possibly, higher stock returns.

The main limitation of our study is that it uses data only for one year. This is due to the lack of sufficient publicly available data. More specifically, even though the financial statements of banks are available for more years than 2022, this is not the case for Morningstar Sustainalytics' ESG risk scores. Therefore, one could seek access to historical data on ESG risk scores and expand our work. Moreover, our study considers linear relationships between the examined variables. One could also examine the possibility of a non-linear correlation between financial performance and ESG performance, size, leverage, liquidity, efficiency and revenue per employee. Finally, comparisons between of the American banks to the European banks (or banks from other continents) could be applied too. Such a comparison would be highly desirable given that, contrary to what usually happens, European corporations, instead of the American ones, have been the pioneers in the adoption and implementation of strong ESG practices.

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