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### The Link between Corporate Governance, Social and Environmental Performance and Performance

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#### Abstract

The basic principle of good governance for banks is represented by adequate regulation that is oriented towards reducing excessive risk-taking. European banks have faced a variety of ongoing challenges. These challenges include a

slow recovery from the economic recession, the European sovereign debt crisis, and the reputational and financial consequences of various forms of misconduct.

**Keywords:** Corporate Governance, Banking Risks, Banking Performance, Environmental Performance

#### 1. The Level of Knowledge, Objectives and Hypotheses

Banks are part of a sector that is among the most environmentally friendly (Jo *et al.*, 2015) <sup>[18]</sup>. However, financial institutions have begun to face pressure to change their business strategies in order to meet the increasing demands of shareholders and other stakeholders, who place considerable value on environmental protection and conservation. Although banks do not significantly pollute, their impact on the environment can still be minimized in terms of electricity, fuel, water, and paper usage (Miralles-Quirós *et al.*, 2019) <sup>[21]</sup>. When providing loans to customers, the most common environmental criteria considered by banks are location vulnerability and waste management, while more complex environmental issues are often ignored (Ahmed *et al.*, 2018) <sup>[1]</sup>.

In the literature, there are numerous measures to present environmental performance, such as the Environmental Performance Index or the environmental pillar score calculated by Thomson Reuters or Bloomberg. However, it has been observed that there are no studies providing detailed information on the environmental protection measures adopted by the banking sector.

Most previous studies in the banking literature show a positive and significant relationship between environmental performance and financial performance. For example, Shakil *et al.* (2019) <sup>[26]</sup> report a positive association between environmental performance and financial performance of banks in emerging countries. Additionally, financing various environmental projects could become a factor in improving performance in the banking sector (Nizam *et al.*, 2019) <sup>[23]</sup>. In a study conducted on banks from 29 countries during the period 2002-2011, the results obtained by Jo *et al.* (2015) <sup>[18]</sup> show that lower environmental costs have significantly improved financial performance, especially in Europe and North America compared to the Asia-Pacific region.

The authors also find that it is expected that a decrease in environmental protection costs will take at least one or two years before the results can be observed in operational efficiency indicators such as ROA.

A positive and significant relationship between banks' environmental performance and shareholder value creation exists in emerging markets, while in the case of developed markets, this relationship is not significant (Miralles-Quirós *et al.*, 2019) <sup>[21]</sup>. Buallay (2019) <sup>[3]</sup> finds that the disclosure of environmental aspects is positively associated with ROE and TQ, meaning that providing information on potential environmental issues leads to an increase in the financial and stock performance of banks. On one hand, higher profitability is well-regarded by stakeholders, who consider proactivity in various actions that protect the environment as a component of their investment decisions, resulting in better asset efficiency. In a study conducted on the French banking sector, Laguir *et al.* (2018) observe that there is a complex bidirectional relationship between environmental and financial performance, reinforcing each other.

Scholtens (2009) <sup>[25]</sup> finds that most banks conduct environmental risk assessments as part of their lending policies, adopting the recommendations published by the World Bank, which are included in the Equator Principles. These principles provide a basis and framework for developing internal environmental and social policies and practices that financial institutions can independently and voluntarily adopt. In fact, they represent a risk management framework that facilitates the process of

identifying, assessing, and managing environmental and social risks in major project financing. However, only a third of banks offer products or services that focus on energy efficiency or carbon emissions. Additionally, the author mentions that in countries like the Netherlands, Belgium, and the US, many banks offer socially responsible financial products, such as credit cards where carbon emissions are offset through card costs. In this regard, it was considered that resource use and emissions (as components of the environmental pillar score) do not apply to banks (Esteban-Sanchez *et al.*, 2017) <sup>[9]</sup> and therefore, these dimensions were not considered relevant in developing the first hypothesis.

Environmental innovation is a component of the environmental pillar that is indeed relevant for banks. This dimension has not been extensively analyzed in previous studies. However, Jo *et al.* (2015) <sup>[18]</sup> mention that corporate environmental investments, such as environmental innovation technology, can reduce banks' direct and indirect environmental costs. The authors also find that those indirect environmental costs have the highest proportion in the total environmental costs for the financial services sector. In conclusion, banks can indirectly affect the environment through their project financing decisions.

Based on previous literature on the banking sector, inconclusive results have been observed, focusing on overall environmental performance rather than its components, some of which are less relevant for banks. Therefore, the first hypothesis is: there is a significant relationship between environmental performance (environmental innovation) and corporate financial performance in the banking sector.

Corporate social responsibility (CSR) has become a major concern within international organizations and an important topic in both academic and business press (Chakroun *et al.*, 2017) <sup>[6]</sup>. Social performance refers to how banks treat their employees, customers, and community (Miralles-Quirós *et al.*, 2019) <sup>[21]</sup>. The main characteristics of a socially responsible company are corporate transparency and public responsibility (Siueia *et al.*, 2019) <sup>[28]</sup>. In the literature, there are different measures to operationalize social responsibility, such as the social aspect disclosure index, the social pillar score determined by Thomson Reuters or Bloomberg, the social component of the ESG score or ESG disclosure, CSR indices, other presented aspects, as well as initiatives.

Some studies focus on CSR at an aggregate level, an example being Wu and Shen's (2013) <sup>[31]</sup> study discussing banks' motives for engaging in CSR activities. Strategic choices based on product differentiation are expected to reduce competition intensity. In this regard, Buallay (2019) <sup>[3]</sup> suggests that banks should focus more on sustainability reporting, which can lead to better performance and encourages market state institutions and regulators to request clear information for all stakeholders. Buallay *et al.* (2020) <sup>[4]</sup> consider that banks heavily engaged in CSR activities tend to gain loyalty and trust from their customers. Banks work directly with people and communities, so CSR actions are immediately visible and, at the same time, relevant to numerous stakeholders.

There are studies in the literature that show a positive and significant relationship between CSR and financial performance in the banking sector. Larger banks are more likely to engage in socially responsible activities compared to smaller banks. Their financial performance is positively associated with CSR, while the likelihood of future crises is

lower (Cornett *et al.*, 2016) <sup>[7]</sup>. Additionally, according to Shen *et al.* (2016) <sup>[27]</sup>, socially responsible banks have significantly higher financial performance compared to banks that are not socially responsible. CSR activities that are related to core business processes are the main performance drivers, leading to increased firm value and reduced business risk (Bolton, 2013). These activities need to be aligned with the bank's strategies and long-term objectives, as they have a positive impact on financial performance in emerging economies (Djalilov *et al.*, 2015) <sup>[8]</sup>. A positive correlation between social performance and financial performance is reported in the case of Italian banks that have managed to invest and control costs without compromising ethics (Soana, 2011) <sup>[29]</sup>. Fijałkowska *et al.* (2018) <sup>[10]</sup> conclude that there is a positive relationship between CSR effectiveness and financial performance, but this may also be the result of efficient bank management (as a mediating variable).

From the stakeholder theory perspective, social performance should have a positive impact on banks' financial performance (Gangi *et al.*, 2018) <sup>[11]</sup>. On the other hand, according to agency theory, CSR should be negatively associated with financial performance because shareholders are deprived of funds redirected towards social objectives. Indeed, the relevant literature reports several negative correlations between social performance and financial performance. Banks are constrained to spend resources to achieve social performance and should not expect short-term benefits from these activities. Buallay *et al.* (2020) <sup>[4]</sup> find that banks, by allocating resources to various social initiatives and programs, face a competitive disadvantage compared to banks that are less socially engaged, contradicting stakeholder theory. A study conducted on banks in Vietnam during the period 2011-2016 reports a negative and significant relationship between CSR disclosure and financial performance. This could be explained by additional social responsibility requirements when banks face an economic slowdown (Ngoc, 2018) <sup>[22]</sup>.

In line with agency theory predictions, Cabeza-García *et al.* (2010) <sup>[5]</sup> find a negative relationship between corporate philanthropy and financial performance, explaining that valuable resources are allocated to unproductive activities.

Most studies focus on aggregate CSR in the banking sector, while some contributions analyze the dimensions of social responsibility, such as community, employee relations, human rights, and product responsibility, showing either a positive or negative association with financial performance. In a study conducted on 235 banks, Cornett *et al.* (2016) <sup>[7]</sup> mention that the most frequently rated areas included in ESG scores are product responsibility (when reputation is enhanced through the provision of high-quality lending and financing services), community involvement, and workforce diversity.

The relationships with employees are analyzed by Esteban-Sanchez *et al.* (2017) <sup>[9]</sup> and are presented as a measure of commitment and effectiveness in generating loyalty and trust in the bank's workforce. Most studies show a positive influence of employee relations on financial performance, indicating that appropriate policies (e.g., health and safety, diversity, equal opportunities, workforce quality) can generate competitive advantages, reduce staff turnover, increase efficiency, and reduce absenteeism. Gangi *et al.* (2018) <sup>[11]</sup> identify that motivation and retention of qualified employees represent an additional factor of competitiveness

regarding CSR. Remarkable CSR activities make the bank appear attractive to young candidates and enhance its reputation (Jo *et al.*, 2015) <sup>[18]</sup>. Therefore, it is expected that human capital, both directly and indirectly, improves financial performance (Mention and Bontis, 2013) <sup>[20]</sup>.

CSR scores also measure a bank's commitment and effectiveness in generating loyalty and trust through community investments and ethical behavior. Esteban-Sanchez *et al.* (2017) <sup>[9]</sup> find that business ethics and corporate philanthropy can enhance trust in the local community, leading to better cooperation with strategic stakeholders. For banks, reputational risk is linked to the loss of public trust (Gangi *et al.*, 2018) <sup>[11]</sup>.

Product responsibility is associated with customer loyalty, as banks hold customers' deposits and lend them money. However, Esteban-Sanchez *et al.* (2017) <sup>[9]</sup> identify a negative effect of product responsibility on financial performance. Community and customer relations, as well as product responsibility, were not managed professionally during the 2008 financial crisis, leading to a loss of consumer trust in the information and products offered by banks.

Considering that documented relationships can be negative or positive, significant or insignificant, at an aggregate level or on each dimension of social responsibility, the second hypothesis considered is: there is a significant relationship between corporate social responsibility and financial performance in the banking sector.

Corporate governance is an important dimension for banks, ensuring transparency, compliance, and accountability (Miralles-Quirós *et al.*, 2019) <sup>[21]</sup>. Different ownership structures, including foreign or state shareholders, and bank characteristics play a crucial role in social and environmental performance (Chakroun *et al.*, 2017) <sup>[6]</sup>. Bank directors and board members are expected to act in the interest of investors. In this regard, corporate governance describes the systems, processes, structures, composition, and functions of the board, including executive compensation policies and performance criteria for CEOs and board members (Esteban-Sanchez *et al.*, 2017) <sup>[9]</sup>. A key aspect of corporate governance is the internal monitoring system of any bank, including credit risk, leverage effect, information asymmetries, or systemic risk profile (Gontarek and Belghitar, 2018) <sup>[13]</sup>.

In literature, there are different ways to measure the quality of corporate governance, such as the corporate governance disclosure index, the corporate governance pillar score determined by Thomson Reuters or Bloomberg, as well as the governance component of ESG scores.

In a study conducted by Esteban-Sanchez *et al.* (2017) <sup>[9]</sup> in the period 2005-2010, the results show that good corporate governance has a positive effect on financial performance. Miralles-Quirós *et al.* (2019) <sup>[21]</sup> find a significant positive relationship between the quality of corporate governance and the long-term benefits of banks, measured by TQ, both in developed and emerging markets. However, Barnea and Rubin (2010) <sup>[2]</sup> consider that CSR commitment at the managerial level represents an agency problem, as executive management could invest too much in this type of activity to obtain personal benefits. By reducing agency costs related to corporate governance, CSR could lead to an increase in financial performance (Gangi *et al.*, 2018) <sup>[11]</sup> and could build a good reputation for the bank.

The results obtained by Harjoto and Jo (2011) <sup>[17]</sup> show that

governance mechanisms are used to reduce conflicts of interest between stakeholders and managers and that CSR commitment positively influences firm value. The KLD-Business variable, which includes corporate governance, environmental issues, human rights, product issues, and defects, is positively associated with bank performance, suggesting that stronger CSR environments help banks improve their corporate financial performance by focusing on activities directly related to their operations (Bolton, 2013).

Some studies reveal a negative relationship between the quality of corporate governance and the financial performance of banks. Soana (2011) <sup>[29]</sup> concludes that there is a negative relationship between the quality of corporate governance and the return on average equity and return on average assets. Grove *et al.* (2011) <sup>[14]</sup> find that corporate governance factors have a significant influence on financial performance. Firstly, the authors observe that CEO duality is negatively associated with financial performance. These findings are in line with agency theory and confirm that CEO duality indicates a weakness in corporate governance. Additionally, these results are also consistent with media statements regarding an overly powerful CEO, who may hinder the company's performance due to a high appetite for risk. Therefore, the organization's value is directly correlated with stock performance, which is considered a mechanism to mitigate agency costs and align executives' interests with those of shareholders.

In some emerging markets, the effect of corporate governance on bank performance is not present (Shakil *et al.*, 2019) <sup>[26]</sup>. One reason could be the existence of weak corporate governance practices. Another reason could be the lack of public pressure from various regulatory bodies, such as the central bank, the securities commission, and other environmental and social agencies. However, in a study conducted on banks in the US and Europe for a specific event represented by either an acquisition or a merger, Hagedorff *et al.* (2010) <sup>[16]</sup> find that board independence and diversity improve the acquisition process performance only if there are strict banking regimes. Strict banking regimes refer to different situations where regulatory bodies have the authority to prohibit the type of activities banks can carry out; to increase the level of capital to meet legislative requirements; to fine or revoke bank directors without conducting a process or hearing; and to request new board elections within banks. Conversely, if there is a less strict regulatory regime, corporate governance is practically irrelevant in improving the financial performance resulting from the merger activity.

Since there is no consensus in the literature on the positive or negative impact of the quality of corporate governance on financial performance, a third hypothesis is proposed, namely: there is a significant relationship between the quality of corporate governance and financial performance in the banking sector.

## 2. Sample and Data Source

The population is represented by banks headquartered in countries located in emerging and developed Europe. This article is primarily based on data collected from Thomson Reuters, except for control variables that highlight macroeconomic aspects, which were collected from World Bank statistics.

The primary list was compiled as follows: ESG scores for 2022 were extracted for all banks in developed Europe (233 banks, out of which 151 had no available ESG data, 5 banks had very limited data, and 77 banks qualified for the next stage of analysis); ESG scores for 2022 were extracted for all banks in emerging Europe (171 banks, out of which 144 had no available ESG data, 2 banks had very limited data, and 25 banks qualified for further analysis); the eligible population of 102 banks was further analyzed, and 32 banks were not included in the sample (16 banks had data available for only one year; 4 banks for 2 years; 3 banks for 3 years; 5 banks for 4 years, and 4 banks for 5 years).

The selection criterion was the availability of the combined ESG score for the entire period of 2017-2022; therefore, the database includes 70 banks (54 from developed Europe and 16 from emerging Europe).

The classification between emerging Europe and developed Europe is taken from Thomson Reuters, noting that all countries in emerging Europe have functional currencies other than the euro. Financial data and ESG scores were also collected from the Thomson Reuters database, which has been used in previous studies, either focused on the banking sector or combined banking and non-banking sectors.

### 3. Dependent Variables-Measures of Financial Performance

Buallay (2019)<sup>[3]</sup> uses return on assets (ROA) as a measure of operational performance, return on equity (ROE) as a measure of financial performance, and Tobin's Q ratio (TQ) to measure market performance. ROA is also used as a measure of past performance (Bolton, 2013) and is influenced by credit risk (Chowdhury *et al.*, 2017). In this article, ROE was used to indicate a bank's expansion and competitiveness (Nizam *et al.*, 2019)<sup>[23]</sup>.

Although not specific to banks, net profit margin (NPM) was used in this article, considering it as a ratio that reflects profitability obtained from specific business activities conducted by banks.

Miralles-Quirós *et al.* (2019)<sup>[21]</sup> mention that TQ refers to market valuation and a bank's ability to generate profit for its shareholders, from the cost of replacing assets. The ideal value of TQ is 1, which means the valuation is in equilibrium. If TQ is greater than 1, the bank is considered attractive to potential investors, as profits exceed the cost of assets. A value less than 1 means it would be better for the bank to sell some of its assets. The main advantage of TQ is that it is not solely calculated based on accounting data that could be influenced by various factors, in some situations.

As mentioned by Maqbool and Zameer (2018)<sup>[19]</sup>, there is no consensus on measuring financial performance, and based on previous research, it would be recommended to use performance indicators that reflect both stock market profitability and company profitability. Stock price has been used as a dependent variable in previous studies on the banking sector (Miralles-Quirós *et al.*, 2019)<sup>[21]</sup>, and for the purpose of this article, previous models were adapted by calculating stock market returns (SMR) as a variation of stock price.

This article considered ROA, ROE, and NPM as accounting indicators of financial performance, while TQ and SMR represent market (or stock market) indicators of financial performance. Consistent with previous literature, this article used five dependent variables as measures of financial performance, reflecting either operational performance (21

studies), financial performance (18 studies), or market performance (7 studies).

### 4. Predictors-ESG Measure

The ESG data was collected from the ESG module of Thomson Reuters (Refinitiv), which has improved and replaced the previously used Asset4 module. This new database contains information for approximately 9,000 companies globally, as mentioned in the ESG scoring methodology. Compared to previous studies that used Asset4, the data collected for this article is based on the most updated module provided by Thomson Reuters.

The combined ESG score provides details on the bank's ESG performance, with information on the ESG pillars (coded by Thomson Reuters specialists) and ESG controversies (captured from global media sources).

In this article, the combined ESG score was not included in the econometric model. However, this indicator was considered in the conducted robustness tests to connect with previous contributions. Similarly, the three dimensions of the combined ESG score (environmental, social, and governance pillar scores), representing the relative sum of the weights of each category, were included in the robustness checks for comparability.

Within this article, the three dimensions of ESG performance were analyzed, focusing on the specificities of the banking sector. Corporate social responsibility is considered part of the social pillar score, but CSR strategy is included in the governance pillar as that is how the data is stored in Thomson Reuters.

The environmental pillar score contains three dimensions. Resource use was considered irrelevant for banks as it compiles data primarily on water and energy efficiency, which represent fixed costs. Emissions are considered irrelevant as banks do not have significant industrial or agricultural activities. However, environmental innovation is a relevant predictive factor in the econometric model as it aggregates data on financing environmental projects, environmental products, managed environmental assets, and products derived from green energy.

The social pillar score contains four dimensions, all of which were considered relevant for this study. Workforce (SocWF) includes data on health and safety policies, training and development policies, diversity and equal opportunities, wage gaps, employee turnover, and flexibility of working hours (part of the digitalization processes within banks).

The human rights dimension includes data on freedom of association, child labor, and human rights. Community includes data on fair competition, bribery, corruption (regarding anti-money laundering efforts), business ethics (regulated in the banking sector and supported by recommendations issued by EBA), community involvement, and community financing. Lastly, product responsibility contains information on data privacy (especially General Data Protection Regulation), customer satisfaction, and quality management systems.

A total of 19 studies have analyzed corporate social responsibility, social performance, the presentation of social responsibility elements, or the social risk factor as independent variables. Of these studies, 14 are specific to corporate social responsibility. There is only one study (Esteban-Sanchez *et al.*, 2017)<sup>[9]</sup> that used similar predictors to the social pillar components considered in this article.



Governance includes the functions and policy of the board structure, reporting by the internal audit department, succession planning, external consultants, board size, the existence of committees such as audit, nomination, and remuneration committees, and non-executive board members (in the case of banks, all these characteristics are heavily regulated).

The shareholder dimension compiles data on equal shareholder rights, the maximum percentage of votes that can be held, the power to veto official actions, the ownership of golden shares that can surpass other shares in certain identifiable circumstances, majority state ownership, anti-takeover techniques, as well as the ratio of non-audit service fees to audit service fees. CSR strategy refers to sustainability and CSR committees, GRI reporting recommendations, external audits of CSR sustainability, and global reporting activities.

Coherence and comparability, as properties of relevant information, have been ensured in this article by using specific dimensions of the three pillars. As a result of the analysis conducted on the collected data, missing observations have been identified, such as Banca Carige SpA Cassa di Risparmio di Genova e Imperia, for which the environmental pillar score was available, while its environmental innovation score was missing. Similarly, the social pillar score is available at an aggregate level, while two out of the four dimensions (workforce and human rights) had missing data either for the entire period analyzed in this study or for a part of the period.

Regarding data quality, as mentioned in Refinitiv's official publications, Thomson Reuters employs various methods to achieve this objective, such as 400 error checks incorporated into the data collection tool, 300 automated quality checks as part of the post-production phase, independent audits including daily samples and weekly reporting, and data analysis that can be visualized in various forms, such as heatmaps, to prioritize certain areas and related actions, as part of the review phase conducted by management. However, the data is subject to relevant limitations, as exemplified by Banca Carige SpA Cassa di Risparmio di Genova e Imperia. The missing data is observed at a disaggregated level, and even if aggregated scores are available, it would not be appropriate to use aggregated pillars as the data would not be comparable from year to year. Therefore, this motivates the approach taken in this article, which is to use only specific dimensions of the bank instead of aggregated data.

The main contribution of this article is the focus on the relevant components of the three pillars of ESG performance.

## 5. Control Variables

This article includes two types of control variables: bank-specific and country-specific, which may affect the relationship between ESG performance and financial performance.

Bank-specific control variables have been grouped into four categories, considering the EBA methodological guide: size, measured by the natural logarithm of total assets or the natural logarithm of the number of employees; leverage effect (Lev), loans to total deposits (LoansDep), and customer deposits to total liabilities (CustDepLiab); capital adequacy ratio (CapAdq); and liquid assets ratio (LqAssets). Size is measured as the natural logarithm of total assets and

has been used in previous banking studies as a control variable (Platonova *et al.*, 2018)<sup>[24]</sup>. Siueia *et al.* (2019)<sup>[28]</sup> report that larger banks facilitate the process of attracting cheaper capital, aiming to have more resources to invest in CSR activities. Nizam *et al.* (2019)<sup>[23]</sup>, in a sample of 713 banks from 75 countries, during the period 2013-2015, consider that larger credit institutions are more diversified across multiple sectors, thus being more exposed to media and community scrutiny. Some studies use size as a control variable measured by the natural logarithm of the number of employees (Esteban-Sanchez *et al.*, 2017)<sup>[9]</sup>.

Leverage effect (Lev) has been used as a control variable in the literature, calculated either as the ratio of total debt to total assets (Shakil *et al.*, 2019)<sup>[26]</sup> or the ratio of total capital to total assets (Buallay, 2019b; Shen *et al.*, 2016)<sup>[3, 27]</sup>. In this article, leverage effect refers to the investment strategies of banks using borrowed capital to create shareholder value, thus it has been calculated as the ratio of total debt to total capital, in line with previous studies (Gangi *et al.*, 2018)<sup>[11]</sup>.

The ratio of loans to total deposits (LoansDep) reflects the proportion of loans funded by deposits, specific to the banking sector and consistent with previous studies (Gonenc and Scholtens, 2019)<sup>[12]</sup>. Shen *et al.* (2016)<sup>[27]</sup> mention that banks investing in CSR attract more deposits, while their loan volume increases. The proportion of deposits to total liabilities is considered as a specific indicator of bank funding that can affect financial performance. Therefore, the ratio of customer deposits to total liabilities (CustDepLiab) is defined as a control variable in this research, although it has not been previously used in the literature.

The capital adequacy ratio (CapAdq) is a specific banking indicator that shows compliance with regulated capital requirements and, as mentioned by Hafez (2015)<sup>[15]</sup>, estimates the financial risk arising from the obligations that banks have towards their creditors and customers. Capital adequacy has been used as a control variable in previous studies in the banking sector (Zabawa and Kozyra, 2020)<sup>[32]</sup>. Siueia *et al.* (2019)<sup>[28]</sup> consider the capital adequacy ratio as an indicator of default risk, reflecting the bank's ability to support its current capital structure.

The liquid assets ratio (LqAssets) is specific to the banking sector, reflecting risk management by credit institutions. A lower ratio indicates more aggressive management with a higher risk appetite (Nizam *et al.*, 2019)<sup>[23]</sup>.

Two country-specific control variables were used, per capita GDP (GDPpc) and GDP growth (GDPgr). Buallay (2019)<sup>[3]</sup> mentions that countries differ in terms of intellectual property regimes, technological capacity, economic development, and geographical area. Per capita GDP has been defined as a control variable, in line with the literature in the banking sector (Gangi *et al.*, 2018)<sup>[11]</sup>. Additionally, GDP growth has been assimilated as an indicator of macroeconomic dynamics (Buallay *et al.*, 2020)<sup>[4]</sup>.

## 6. The Econometric Model and Statistical Methods

Panel regression was used, which has the advantage of analyzing data over a longer period, six years in the case of this article, and it has been found that this method has been used in many recent banking studies (Buallay *et al.*, 2020)<sup>[4]</sup>.

Buallay *et al.* (2020)<sup>[4]</sup> observe that panel data modeling techniques, whether it is fixed effects models or random effects models, are frequently adopted in the literature on

corporate performance and particularly in the banking field. Esteban-Sanchez *et al.* (2017)<sup>[9]</sup> specify that panel data has a larger number of observations, reducing collinearity among independent variables and increasing degrees of freedom. Therefore, the advantage of specifying random effects or fixed effects lies in their ability to control for unobserved heterogeneity.

Panel regressions with random effects can analyze two sources of variance, such as the variance between subjects and the variance of the subject over time (Weber, 2017)<sup>[30]</sup>. To decide which model is applicable, whether fixed effects (FE) or random effects (RE), the Hausman test was used, and the results showed that the fixed effects model provides the most accurate estimation for ROA, ROE, NMR, and TQ. Estimations using fixed effects suggest that banks differ significantly from each other when considering these dependent variables, while random effects models provide the most accurate estimation for SMR, as stock returns are determined in a common capital market.

### 7. Descriptive Statistics, Correlations, and Group Tests

Using the Shapiro-Wilk test for data normality, it was observed that none of the variables have a normal distribution ( $p < .001$ , except for Combined ESG, where the W statistic is significant at  $p < .05$ ). Among these, ROA, ROE, and NMR have a negative skewness, while TQ and SMR have a positive skewness. Among the ESG indicators, all variables have a negative distribution, except for the shareholder dimension (GovSH) which has a positive distribution. The panel data format of the used data means that the econometric analysis considered fixed effects (within each bank) and random effects (differences between banks).

Correlations are presented separately for the main predictors and control variables. Accounting-based financial performance measures (ROA, ROE, NMR) are strongly correlated with each other but moderately correlated with market-based financial performance measures (TQ, SMR). The ESG dimensions are not highly correlated with each other, indicating that they indeed measure different aspects of ESG performance. None of the control variables are strongly correlated with the dependent variables, meaning that no predictor captures a large proportion of the variance in each financial performance indicator.

Group tests for differences between Emerging Europe ( $n = 16$  banks) and Developed Europe ( $n = 54$  banks) indicated that banks belonging to the former group have, on average, higher levels of corporate financial performance recorded by all dependent variables. However, banks in Emerging Europe have significantly lower ESG performance for all dimensions and pillars, except for the community and product responsibility dimensions, where the differences are not significant.

Banks in Developed Europe have significantly higher levels in terms of leverage effect (Lev), as well as capital adequacy ratio (CapAdq) and liquid assets ratio (LqAssets). Lastly, banks in Emerging Europe are significantly smaller than banks in Developed Europe in terms of total assets, but they are similar in terms of the number of employees, where the results are not statistically significant. Emerging European countries also have a significantly higher GDP growth rate compared to Developed European countries.

### 8. The Results of the Regressions for the Main Model

The results for the main regression model are presented with logTAssets as a measure for bank size. The Hausman test indicated that fixed effects models are recommended for four out of five specifications (ROA, ROE, NMR, and TQ), indicating that the bank-specific effect is correlated with the explanatory variables in those estimations. Only the SMR regression used a random effects model, meaning that the bank-specific effect is truly random and not correlated with the regressors for the same entity.

It was found that environmental innovation (EnvINN), a dimension of the environmental pillar (Environment), has a significant negative relationship with ROE and NMR, which are accounting-based measures of corporate financial performance, thus confirming hypothesis 1. This relationship does not hold for market-based indicators that measure financial performance.

Several dimensions of the social pillar (Social) are in a significant relationship with the CFP measures. The dimension of human rights (SocHRights) is positively associated with all three accounting-based measures of corporate financial performance but negatively associated with stock market returns (SMR). Mixed results were also found for the workforce dimension (SocWF), with a negative influence on Tobin's Q ratio (TQ) but a positive influence on stock market returns (SMR).

Finally, it was observed that the product responsibility dimension (SocPRD) is negatively associated with stock market returns (SMR). However, the SMR model was estimated differently from the other four models (i.e., using random effects), capturing a larger portion of the variance between banks, suggesting greater homogeneity at the market level. Despite the mixed results regarding the dimensions of the social pillar, hypothesis 2 was considered confirmed.

However, none of the dimensions of the governance pillar (Governance) are significant predictors in any of the models, thus rejecting hypothesis 3 for the main specification.

Regarding the control variables, statistical results showed that the leverage effect (Lev) is a significant predictor for all accounting indicators, while bank size is a significant predictor for market-based performance measures.

For the main regression model, LogEmpl was also used as a measure for bank size to compare the results. The Hausman test indicated the same results as mentioned above.

Environmental innovation (EnvINN) has a significantly negative relationship with ROE, confirming hypothesis 1, while no relationship was found with market indicators of financial performance. For the social pillar (Social), the results are similar, with the exception of workforce dimension (SocWF), which has no significant influence on Tobin's Q ratio. Thus, hypothesis 2 was confirmed. The management dimension (GovMN) is negatively associated with Tobin's Q ratio, confirming hypothesis 3 for this specification. Regarding control variables, leverage effect (Lev) is negatively associated with all three accounting measures, while being positively associated with Tobin's Q ratio. Similar to the main model, bank size (LogEmpl) represents a significant predictor of corporate financial performance measures from a market perspective. Customer deposits to total liabilities (CustDepLiab) are positively associated with two out of three accounting measures, return

on equity (ROE), net margin (NMR), and with stock market returns (SMR).

### 9. Robustness Test

Firstly, the model was re-run using ESG pillars as predictors, aggregated at the level of the environmental, social, and governance pillar scores, and LogTAssets as a measure for bank size. It was found that the environmental pillar (Environment) has a significant negative relationship with all three accounting measures of corporate financial performance, confirming hypothesis 1. Fixed effects models for ROA, ROE, and NMR mainly captured variance within each unit of analysis (i.e., within each bank in the analyzed period).

The social pillar (Social) is positively associated with all three accounting measures, confirming hypothesis 2. Since the governance pillar (Governance) is not a significant predictive factor in the robustness test performed, hypothesis 3 was rejected. Comparing these results with those of the main model, it was observed that relevant dimensions of corporate governance quality have no impact on corporate financial performance. No significant associations were found between ESG predictors and market-based financial performance measures, and therefore no hypothesis was confirmed. With respect to control variables, the same negative association was identified between the leverage effect (Lev) and accounting measures of CFP.

Secondly, the results of the model that adopted a higher level of aggregation, namely the combined ESG score (Combined ESG), calculated by Thomson Reuters based on the three ESG pillars, including existing controversies, are presented. No significant association was found between the main predictor and any measure of corporate financial performance, either from an accounting or market-based perspective. Regarding control variables, the leverage effect (Lev) is negatively associated with all three accounting measures (ROA, ROE, and NMR), while the liquidity ratio (LqAssets) is positively associated only with market-based returns (SMR).

The random effects model captured a large proportion of the variance between banks in the sample, considering that this group of banks is more homogeneous. No significant relationship was found between environmental innovation (EnvINN) and any of the financial performance measures, thus rejecting hypothesis 1.

Contrary to the main model, the human rights dimension (SocHRights) is negatively associated with all three accounting measures, while no significant relationships were identified with market-based indicators of CFP. Consistent with the main model, the workforce dimension (SocWF) is negatively associated with Tobin's Q ratio (TQ), while two other relevant dimensions, community (SocCOM) and product responsibility (SocPRD), are not significant predictors of any measure of corporate financial performance. However, despite mixed results regarding the social pillar dimensions (Social), hypothesis 2 was considered confirmed for four out of five CFP measures, with the exception of market-based returns (SMR).

The Governance pillar (Governance) is a significant predictor in this robustness test, due to the CSR strategy dimension (GovCSR) and its positive association with return on equity (ROE). Thus, it was argued that hypothesis 3 is confirmed for this component of corporate governance.

Regarding control variables, the results are mixed compared to the main model, with logTAssets being negatively associated with Tobin's Q ratio (TQ) and positively associated with two out of three accounting measures (ROA and ROE), with no significant relationship with market-based returns (SMR). Contrary to the main model, in Emerging Europe, there was a positive association between the liquidity ratio (LqAssets) and two accounting indicators, return on assets (ROA) and return on equity (ROE).

Even though both random effects and fixed effects were used for different models, the results are qualitatively similar, suggesting that the specifications are robust. Compared to Emerging Europe, where hypothesis 1 was rejected, the environmental innovation dimension (EnvINN) is negatively associated with all three accounting measures, while no significant relationship was identified with market-based indicators.

For the workforce dimension (SocWF) and human rights dimension (SocHRights), the results for Developed Europe are exactly opposite compared to Emerging Europe. The workforce dimension (SocWF) is positively associated with market-based returns (SMR) and not significantly associated with Tobin's Q ratio (TQ). The human rights dimension (SocHRights) shows a significant positive association with the three accounting indicators measuring CFP. The community dimension (SocCOM) and product responsibility dimension (SocPRD) have no significant relationship with any measure of CFP.

Additionally, no significant relationship was found between corporate financial performance and the CSR strategy dimension (GovCSR), while a negative association was observed between the shareholder dimension (GovSH) and Tobin's Q ratio (TQ). Thus, the results confirmed both hypothesis 2 and hypothesis 3.

Regarding control variables, LogTAssets has no significant relationship with any of the accounting measures, while it is positively associated with market-based returns (SMR).

The leverage effect (Lev) is negatively associated with all three accounting measures, which is consistent with the main model but contrary to the robustness test in Emerging Europe, where no significant association was found.

### 10. Discussions

The formulation of hypotheses does not specify the expected relationship to be obtained, due to the mixed results of previous studies in the literature. The discussion below aimed to clarify the significance and category of each result in this article.

The negative relationship between environmental innovation (EnvINN) and the accounting measures of corporate financial performance (ROA, ROE, and NMR) is confirmed in all models, except for the one that includes banks in Emerging Europe (for which the association is still negative but not statistically significant). The results of this article have shown that environmental innovation is a strategic factor associated with a decrease in the value of accounting performance indicators. In other words, banks with higher corporate financial performance are less focused on energy products, environmental products, and financing environmental projects, and have fewer products involving renewable energy. However, it is expected that the focus on the environment will increase in the future, due to measures taken by central banks and supervisory authorities, such as the Network for Greening the Financial System or the



European Central Bank, regarding climate change risks. The effects of transitioning to a low-carbon economy and severe weather events are expected to impact banks' activities in the long term. Therefore, they need to assess the business continuity issues that may arise and the risk profile of their assets, for example, credit exposures to the automotive and agricultural industries.

There is a positive relationship between the workforce dimension (SocWF) and market-based returns (SMR) for the main models and Developed Europe. These results indicate that labor policies adopted by credit institutions lead to an increase in the value and reputation of the bank, making it more attractive to potential investors. Skills development and professional training are an important component of the workforce dimension. In this way, banks can strengthen the control environment that protects their reputation. Additionally, strong policies on health and safety in the workplace, diversity, equal opportunities, and flexible working hours are important components of the workforce dimension, with an impact on employee turnover.

Currently, these issues are of great interest to banks as they enhance workplace motivation, leading to higher staff productivity and increased shareholder value, measured through market-based returns (SMR). In a survey of the millennial generation in the workplace, PwC (2020) identified that 28% of participants mentioned that work-life balance in banks was weaker than expected, while 21% stated that they would not work in the financial services sector due to its reputation being greatly affected after the pandemic crisis. It is not surprising that 69% of millennials working in banks considered rigid hierarchies and outdated management styles as a major impediment to career satisfaction. Investments in workforce development and protection are expected to generate higher returns in the stock market, considering that improvements in organizational culture are also necessary.

The positive relationship between the human rights dimension (SocHRights) and accounting measures of corporate financial performance (ROA, ROE, and NMR) is confirmed in all models, except for banks in Emerging Europe, where the results show the opposite. This suggests that through previous investments and actions taken regarding human rights policies, banks in Developed Europe have been able to achieve higher financial performance, already achieving their strategic objective of being perceived as socially responsible. In contrast, banks in Emerging Europe continue to invest their resources in this direction, generating a marginal decrease in financial performance, measured through accounting indicators, due to associated costs. However, the human rights dimension (SoHrights) is negatively associated with market-based returns (SMR), while a non-significant and negative relationship was observed for banks in Emerging and Developed Europe, analyzed separately. This means that banks with stronger human rights policies have obtained lower returns in the market, while banks with higher market-based returns are those with weaker human rights policies. An explanation for this negative relationship could be the need to improve policies regarding freedom of association in the banking sector. At the same time, this negative relationship does not necessarily mean that freedom of association and human rights policies do not exist, but rather that they have already been implemented to some extent, and new developments are harder to observe.

No significant relationship was identified between the product responsibility dimension (SocPRD) and market-based returns (SMR) for Emerging and Developed Europe, analyzed separately. However, the results showed a significant negative relationship when the entire sample was analyzed. Thus, banks that focus on increasing customer satisfaction, strong data privacy policies, and quality management systems have obtained lower performance in the market. Additionally, banks with higher market-based returns are less concerned with product responsibility, while banks with lower returns are more focused on improving this dimension. Another possible explanation could be that banks reinvest their earnings to strengthen their product responsibility instead of paying higher dividends to minority shareholders. Therefore, such banks may become unattractive in the market and generate lower returns. However, this hypothesis would require further investigation.

The only significant and positive relationship between the CSR strategy dimension (GovCSR) and accounting performance measures (ROE) was identified in the case of banks in Emerging Europe. These financial institutions have a high potential for developing their CSR strategy and still need improvements in CSR ratings, although they are not significantly different, on average, from banks in Developed Europe. For the latter group, a non-significant relationship was observed between the CSR strategy dimension (GovCSR) and capital profitability (ROE), suggesting that these banks have already consolidated their CSR strategy. Evidence can be seen in the creation of CSR sustainability committees, which coordinate the social and environmental strategies of these banks, such as human rights policies and environmental innovation.

The results of the article showed that banks in Emerging Europe have, on average, a significantly higher Tobin's Q ratio (TQ) than banks in Developed Europe, indicating that the former are, on average, overvalued. The negative contribution of the workforce dimension (SocWF) suggests that market perception of workforce policies determines the need for correction for overvalued companies, considering that banks in Emerging Europe have a much lower quality of labor protection than banks in Developed Europe. On the other hand, shareholder protection (GovSH) has determined the need for a negative correction of market valuation for banks in Developed Europe, which already have much better governance ratings than similar credit institutions in Emerging Europe. This result could suggest that improvements in banks' shareholder protection policies in Developed Europe are accompanied by a more pronounced undervaluation in the market. The same conclusion can be reached regarding the negative contribution of management quality (GovMN).

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