



Study on the strategic influence of corporate social responsibility in the world's most digitised banks



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ABSTRACT

Spanish banking is one of the most digitised at international level, according to Deloitte. Given the changes implied by digitalisation in the value chain, this research studies the specific case of the impact of CSR (Corporate Social Responsibility) on banking and share prices. For that, this work is an analysis of its impact quantitatively, through the banking companies analyzed in the Spanish MERCO Responsibility ESG (Environmental, Social & Governance) and their share price in the Madrid Stock Market for said companies from 2011 to 2019. These parameters are compared with regressive, autoregressive, and moving average econometrical methods overtime to reach a conclusion on the impact of CSR on the share value during a digital transformation process. Results reveal that there is a directly relationship between corporate social responsibility and the share price measured by the MERCO ESG Ranking in the banking sector in Spain. In view of that, this work aims to demonstrate that CSR proves to be a value that shareholders can trust over time, even though the company may be going through a period of digital transformation.

1. Introduction

In such an economically unstable environment as the one we are living in, digital transformation is becoming a way for companies to continue their activity. This is not a new phenomenon given that some authors claim that we are in the fourth industrial revolution or in a Globalization 4.0 (Braña, 2019; Tutak and Brodny, 2022) due to the implications that digital transformation is having on production, management, and corporate governance processes (Schwab, 2016; Mirković et al., 2019; Yukhno, 2021). Moreover, digitalization not only involves companies using new technologies, but also brings innovations with it an organizational, financial, structural, and value proposition change in other words, a change at the strategic and social level of the entire company (Diener and Špaček, 2021; Du et al., 2022).

The banking sector stands out in digital transformation starting this process more than 30 years ago (Valverde, 2017). Nevertheless, it had an inflexion after the financial crisis of 2008 (Pintea, 2020) and the current health pandemic due to COVID-19 (Deloitte, 2020). However, the breakthrough in this sector has been its resounding commitment to digitization over the last decade (Sedaghatparast, 2019), with

investment three times higher than other sectors (Giatsidis et al., 2019). A good example of this progress has been Spanish banking, which is considered one of the most digitised in the world (Deloitte, 2022).

In this process of digital transformation that banking is undergoing, there are some authors (Forcadell et al., 2019; Gupta and Kanungo, 2022; Úbeda et al., 2022) who argue that sustainability is serving to mitigate the possible drawbacks of the changes that digitalisation entails (such as branch closures or job losses) or even improve access to financial inclusion. But on the other hand, other authors (Chueca and Ferruz, 2021; Molina, 2021; Lee and Raschke, 2023) highlight the tensions of the banking sector when committing to sustainability in order not to fall into greenwashing or to cover up the situations caused by digitalisation.

This research builds on a previous more general study of the impact on the share price of CSR (Corporate Social Responsibility) investment in a set of 27 listed companies in the Spanish stock market (Lopez et al., 2022). In this case, the motivation lies in proposing an analysis of one of the sectors that has undergone the most changes in recent years and where the link between CSR and the digital transformation of a specific industry has hardly been studied. Because of that, this paper focuses on

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studying the connection between CSR, ESG (Environmental, Social & Governance) scores as an extension of CSR strategies (Gillan et al., 2021) and the digitisation of banking, and specifically on the case study of Spanish banks as one of the most digitised banks in the world (Deloitte, 2022). Hence, the research question (Q1) is: Is there a relationship between continuous investment in CSR and the share price of Spanish banks analysed by the MERCOS ESG Responsibility Ranking (hereafter MERCOS ESG Ranking), between 2011 and 2019 (without considering the effects of COVID-19)?

The originality of this work lies on the one hand, in the theoretical contribution of the study between CSR, ESG and digitalization. On the other hand, at a practical level it demonstrates economically how CSR brings value to shareholders in industries as changing as banking at a time of high transformation. Apart from that, on a practical level, it demonstrates economically how CSR brings value (Zheng et al., 2022), trust and stability to shareholders in changing industries such as banking at a time of great transformation. This demonstrates that the innovation of digital transformation, in order to be long-lasting, must be sustainable.

To this end, this article is divided into four parts: a first part is a review of the literature on digital banking and CSR; a second part where is presented the methodology followed based on regressive, autoregressive, and moving average econometrical methods and the sample of companies analyzed; a third part to present the results; finally, a section where the main conclusions and topics for discussion are provided.

2. Theoretical framework

2.1. The transformation of digital banking

Although terms such as Bitcoin, cryptocurrencies, blockchain, Ethereum or financial Sandbox, are still unknown to many people, banking has been one of the most innovative sectors in recent years and it has helped people to digitize to manage their finances in the COVID-19 times we are living (Funcas, 2020; European Commission, 2020). Beyond adapting its services to the needs of its customers and improving user experience, banking has been one of the most digitized industries (Naimi-Sadigh et al., 2021; Patri, 2021) due to strong competition from BigTech (Clavijo & Rincón, 2021; Rentería et al., 2021) such as the so-called GAFA (Google, Apple, Facebook, Amazon). According to Funcas (2021), users value Google, Amazon, and Apple as their preferred option for opening a current account. In this regard, the case of WeChat in China is relevant, where this messaging service of the technology company Tencent, has become one of the main payment platforms in the country (Chen et al., 2021).

On the other hand, traditional banking has often been overtaken by financial startups, given the speed of fintech in creating specific products for this sector (Japparova and Rupeika-Apoga, 2017). Besides, banks have also had to respond to neobanks that only offer their services through the Internet (Noya, 2016) with similar proposals to maintain customers. In this sense, the main challenges facing banking are, on the one hand, to continue providing face-to-face services to part of the ageing population (Sedaghatparast, 2019), while continuing to work on digital transformation, improving end-to-end digital sales processes, collaborating with fintech startups, and avoiding the entry of new competitors (Deloitte, 2020; Funcas, 2021; Diener and Špaček, 2021).

Due to increased computational and storage capacity, banking has incorporated new digital services and processes (Sedaghatparast, 2019; Agustí and Orta-Pérez, 2022) and even new business models (Tornjanski et al., 2015). In fact, big data management is considered one of the main axes of banking digitization (Mirković et al., 2019). Other tools are also being incorporated, such as geolocation and natural language processing to provide new products and services, such as personalized offers; predictions of user behaviour in the face of possible

casualties or fraud; the incorporation of new payment methods via smartphone; augmented reality; the emergence of cryptocurrencies; biometrics for authenticating people; instant person-to-person payments; chatbots to serve people 24/7; and even agile methodologies are being incorporated for the design and execution of new products and/or services (Braña, 2019; Mirković et al., 2019; Sedaghatparast, 2019; Bostan, 2020; Toloba and Del Río, 2020; Naimi-Sadigh et al., 2021).

The digital transformation of banking is also translating into greater competitiveness in the sector, greater transparency and better corporate governance thanks to faster and more efficient auditing systems, procedures that allow for improved decision making and the detection of inappropriate behaviour, to minimize business and reputational risks (Aracil, 2018; Bouncken and Kraus, 2021). Such digitalization also brings other social benefits related to greater inclusion and financial literacy of individuals (Valverde, 2017; European Commission, 2020; Bostan, 2020; Fernández-Olit et al., 2022), given the direct relationship between GDP per capita and financial access (Aracil, 2018). But the risks of such digitalization in banking are also closely monitored, especially those related to money laundering with cryptocurrencies such as Bitcoin, with moral dilemmas due to the biases of those who program the different artificial intelligence prediction systems or due to the asymmetry in the information that data can provide (Pintea, 2020).

In the case of Spain, in 2010 digital banking went from a penetration of 24% (BBVA Research, 2017) to a penetration of 55% in 2019 (Statista, 2020), being one of the countries with the most digitized banking in the world (Deloitte, 2020). The factors that have driven this adoption in Spain have been education and better digital skills, increased use of the Internet, better technological equipment of people, high penetration of smartphone use, rising income levels and as the most recent reason, movement restrictions and precautionary measures due to COVID-19 (BBVA Research, 2017; Funcas, 2021). Additionally, as is happening internationally, some technology companies in Spain (such as Telefónica, Orange or Yoigo) are offering financial services providing more products to attend all the customer demands.

2.2. Digitalisation, CSR, corporate governance, and impact on reputation

In recent years, scholars have studied Corporate Social Responsibility (CSR), its evolution and the effects on different stakeholders and society (Carroll, 2021). CSR is defined as the responsibility of enterprises for their impact on society (European Commission, 2011). The literature about CSR explores the relationship of companies with their stakeholders (Carroll, 2021). In this sense, the stakeholder theory explains the connection between CSR and stakeholders of a company (Dmytriyev et al., 2021) affecting its reputation in a positive manner (Freeman, 2010; Muliani et al., 2020). Therefore, companies that develop CSR activities and satisfy the stakeholders' expectations reducing their reputation risks (Li & Woodall, 2020).

Today CSR is required of companies because different stakeholders are demanding more transparency and firm commitments (Du et al., 2010; Golob et al., 2013) through ESG scores in the CSR strategy of companies (Gillan et al., 2021; Clément et al., 2023). Furthermore, scholars have studied the companies' motivations to create a CSR strategy including instrumental, political, integrative and ethical theories (Garriga and Melé, 2004). However, we can also include a multilevel perspective (institutional, organizational, and individual) to understand CSR company motivations (Aguinis and Glavas, 2012). Consequently, CSR has an impact and reinforces legitimacy (Fernando and Lawrence, 2014; Bonsón and Bednárová, 2015; Branco and Rodrigues, 2006; Castelló et al., 2016; Golob et al., 2013) and reputation (Ponzi et al., 2011) and CSR impacts positively on the reputation in the banking industry (Ruiz and García, 2021).

In addition, corporate governance is a relevant aspect of CSR to support the transparency of companies (Jamali et al., 2008; Oino, 2019). Thus, some authors argue that transparency increases when the company shares information with stakeholders (Monks and Minow,

1995). Furthermore, some papers show that governance is the most afforded impact dimension in some industries, i.e. the banking sector (Vicente et al., 2020) due to the high demands of transparency, accountability and ethics inherent to this sector (Herzig and Moon, 2013). Therefore, corporate governance influences CSR (Hazlett et al., 2007; Zaman et al., 2022) when companies report their CSR results. In fact, responsible corporate governance reduces problems with shareholders (Hill and Jones, 1992). In general, governance generates value for investors and all stakeholders in the banking industry (Pekovic and Vogt, 2021) when managers include CSR principles in their strategies. Besides, it has a significant impact on stock prices in banks with a higher score of governance performance (Miralles-Quirós et al., 2019; Gillan et al., 2021).

There is a relationship between social innovation and the sustainable development of companies (Du et al., 2022; El Ghoul et al., 2023) that helps to meet the needs of companies' stakeholders (Lyu et al., 2023). In this sense, the process of digitalisation is the business strategy that companies use to integrate technologies and create a new relationship with the stakeholders (Matt et al., 2015) to increase transparency about products and services (New, 2010; Brown and Brown, 2019), and where open innovation also plays a key role (Abhari et al., 2022; Abhari and McGuckin, 2023). However, scarce literature analyzes how firms can be more efficient in a digital transformation process (Hess et al., 2015; Balakrishnan and Das, 2020). Moreover, companies should consider transparency as part of their competitiveness in the digital environment (Bennis, 2013). Therefore, firms should be cautious about the information they manage protecting critical information and sharing the information selected to the stakeholders (Granados and Gupta, 2013). Thus, banks have incorporated digital infrastructures in recent years, such as online banking, big data analysis, cloud computing, blockchain, artificial intelligence and machine learning (OECD, 2017).

This process is crucial for banks, which have incorporated CSR and sustainability in their digital strategies (Knaut, 2017; Scholz, 2017; Forcadell et al., 2020b) improving their performance and efficiency and consequently increasing reputation (Fombrun, 2005; Forcadell et al., 2020a). Moreover, responsible behavior and stakeholders' positive perceptions affect reputation from a stakeholder theory perspective and its organizational performance (Pérez et al., 2020; Singh and Misra, 2021). Furthermore, reputation is important for the banking industry because their services are intangible (Fombrun, 1996; Wang et al., 2003; Starešinić et al., 2019).

In this context, some authors argue that the combination of CSR and digitalisation mutually reinforce each other, and reputation can balance the asymmetries of customers' information (Su et al., 2016; Forcadell et al., 2020a) because digital banking creates uncertainty for consumers (Nienaber et al., 2014; Kaur and Arora, 2020). Further, the reputation created by CSR and sustainable strategies in the banking sector improves transparency and benefits the relationship with customers (Hoepner et al., 2016) in the digital transformation of banks (Salzmann et al., 2005; Forcadell et al., 2020b).

Because reputation is perceived to increase economic return (Fombrun, 2005; Wang et al., 2016) and a manner to create relationships and enable growth (Doorley and Garcia, 2015), reputation even becomes more relevant in the digital environment for companies (Hearn, 2010; Ruiz and García, 2021). Moreover, some scholars analyze the companies' reputation performance on the Internet using online reputation scores (Elmurngi and Gherbi, 2020) to understand better the main variables of reputation, such as the evaluation of ethics by the customers in the banking sector (Ramos and Casado-Molina, 2021). In conclusion, scholars are increasing the interest in analyzing the impact of the online reputation of firms, especially in the banking industry (Ramos and Casado-Molina, 2021).

This paper contributes to the literature in some aspects. First, to better understand the impact of CSR and digital strategies (Knaut, 2017; Scholz, 2017) improving the efficiency of firms. Second, to reinforce

that CSR improve the relationship with stakeholders when companies report results (Hazlett et al., 2007). And, finally, to recognize that CSR even is more important in the digital environment for companies to create relationships and enable growth (Fombrun, 1996; Wang et al., 2003; Doorley and Garcia, 2015; Starešinić et al., 2019; Forcadell et al., 2020a) in the banking industry.

After reviewing the theoretical framework related to digitalisation and the value of CSR for shareholders, the hypothesis that this article seeks to answer is (H1) *a continued CSR strategy over time has a positive impact on the share price of companies that, like Spanish banks, have undergone major transformations due to digitalisation.*

3. Methodology: data and methods

The methodology in this research encompasses data on banking stock evolution, data on CSR performance by listed banks and a method to analyze such data in order to reach relevant conclusions: the regression method.

3.1. Sample data

The following variables are the base of the methodology (Lopez et al., 2022) in this paper: (i) all listed banks in the Madrid Stock Market that are present in the *MERCO ESG Ranking (2020)*, which is published since 2011 and based on 4 evaluations, 11 information sources and more than 7400 interviews to different stakeholders, that analyze variables ranging from ethical behavior, transparency and good governance, responsibility with employees, commitment to the environment and climate change, or contribution to the community, among others; and (ii) the share price of all banks listed in the Madrid Stock Exchange open market for the same period as in variable (i). Regressive (Gauss, 1823) methods are then used to compare (i) and (ii) to conclude on the impact of transparency and governance, as affected by digitalization in the banking sector, on the share price. Additionally, quality tests have been carried out to such regressions.

3.2. The first variable: the banks in the MERCO ESG ranking

There are several sources that allow for the evaluation CSR measures, specifically transparency and governance. Among all of them, the work described in this paper refers to the *MERCO ESG Ranking* for the following reasons: (i) it contains information for a long period of time (2011–2019); and (ii) it contains information on banks that are listed in the Madrid Stock Exchange, ideal for the comparison of such data against stock prices. Therefore, it is deemed appropriate to use the *MERCO ESG Ranking* as a valid source of information for the methodology hereby described in this paper.

As usual in the world of statistics, to which the methods in this paper refer, homogenization tasks must be carried out in order to solve some distances between the variables in the comparison set forth in this paper. For example, given some banks leave the ranking in one year and others join in other years, the variables are not consistent in time. Therefore, modifications are needed to homogenize the two sets of data used in this paper.

3.3. 1st modification to the MERCO ESG ranking data

The *MERCO ESG Ranking* assigns the best ranked company a score of 10,000 points; when the leader in the ranking loses positions in following years, it is assigned with less points. Still, that downgrade in the ranking does not mean the company has stopped or abandoned its CSR measures, but rather that others have implemented more effective measures and outpaced the leader (i.e.: Santander was ranked by *MERCO* in 2018 in third position with 8652 points, whereas such company was ranked in fourth position in 2019 with 8018; a loss of 634 points). In this regard, the methodology in this paper assumes that

Santander maintained or even enhanced its measures from 2018 to 2019, yet other ranked companies advanced at a faster pace.

Therefore, it is understood that MERCO elaborates its ranking in a comparative basis and establishes the score in its ranking as a comparison from the top company and not in an isolated manner for each company. In order to match this MERCO methodology with regression methods, the scores in the MERCO ESG Ranking have been modified to match the progress of each company (from 2011 to 2019). In this regard, the methodology in this paper states that a company never loses points, which are rather gained by the companies that obtain a higher ranking. This modification entails that companies may obtain more than 10,000 points.

3.4. 2nd modification to the MERCO ESG ranking data

The set of data from the MERCO ESG Ranking annual. To establish a comparable frame for other variables, monthly data has been used as follows: (i) a linear assumption is adopted for the annual MERCO ESG Ranking within the year; and (ii) monthly data is used for the stock prices upon the median of all daily ending prices within each month.

3.5. 3rd modification to the MERCO ESG ranking data

Only banks listed in the Madrid Stock Exchange have been used. Therefore, 6 companies are subject of our analysis (Table 1).

3.6. 4th modification to the MERCO ESG ranking data

The MERCO ESG Ranking states values up to 10,000 points. In order to obtain more comprehensive results, ranking scorings have been divided by 1000.

3.7. The data from the Madrid Stock Exchange

The second variable is the stock price of the aforementioned 6 banks in the Madrid Stock Exchange open market. Among the extensive data on such stock prices (daily starting prices, average prices, highest process, lowest prices and ending prices) this paper contains monthly prices for comparability reasons, calculated as median of the daily starting prices between the 1st and the last day of each month of the analysis period: from 2011 to 2019.

3.8. The regression method: main approach

A regression method is established to measure the relationship between two variables. This paper contains a regression under the “ordinary least squares” method where a linear relationship between an independent variable and a dependent variable is assumed. The work described in this paper contains regressive methods with the following model (hereinafter, Model 1)¹:

$$P_i = b_0 + b_1(MERCO_i) + u_i$$

Where: P_i is the price of the stock i that is ranked in the MERCO ESG Ranking.

$MERCO_i$ is the modified ranking of the company i which stock price is listed.

b_0 and b_1 are the regression coefficients.

u_i is the residual.

The use of the simple linear regression shows certain benefits in relation to the analysis in this document: initially, regression goes

¹ The above model, which has been calculated for each bank in our work for 96 periods (12 months times 8 years – from 2011 to 2019), has been the subject of a series of tests on biasness (Graybill, 1976) and consistency (Upton & Cook, 2008).

Table 1

List of companies selected for the sample used in this paper.

Source: personal elaboration based on publications from the MERCO ESG Ranking from 2011 to 2019 (2020).

Name of the company	Name of the company
Santander	Bankia
CaixaBank	BBVA
Banco Sabadell	Bankinter

beyond a simple correlation (Bangdiwala, 2018), meaning it allows for closer analysis on the regression between variables. Since correlation only refers to degree to which two variables are linearly related (Wooldridge, 2012), a linear regression adds information on the measured impact of one variable in another variable. Therefore, the linear regression chosen for this analysis does provide a more robust methodology.

Secondly, regressions isolate the impact of one variable (independent variable or $MERCO_i$ in our case) in another variable (dependent variable or P_i in our case) while also describing other impacts (Wooldridge, 2012). This means that the model hereby described does not exclude the impact of other variables (Olive, 2017), as many as they may be, but rather does not isolate other impacts, just the one of the independent variable, $MERCO_i$ in this case.

Finally, the use of variable P_i allows for a proper measurement of the value of each company in our sample, as opposed to the used of performance variables (like yield, earnings per share, PER, etc.) which would contaminate the analysis with other factors like size of markets, size of companies, arbitrary dividend policies from each bank, etc. (Linton, 2019).

3.9. A contrasting method

In order to introduce a contrasting approach to the aforementioned regression method, an additional variable has been analyzed. Such variable has to encompass the framework where Model 1 lives, as well as a quantifiable reality.

As a generalization, the GDP reflects the impact of all economic and contextual factor that can be measured broadly, that reflects the economic context in which the 6 banks that are subject to analysis. Therefore, Model 1 has been prolonged as follows (hereinafter, Model 2):

$$P_i = b_0 + b_1(MERCO_i) + b_2(GDP_j) + u_i$$

Where all variables maintain the same meaning as in Model 1 and GDP_j refers to the Spanish GDP in period j as published by INE (2019)² This allows for several beneficial factors: initially, a control variable is included, for the impact of such variable (GDP_i in this case) allows for a contextualized analysis of Model 1 (AlGhazzawi and Lennox, 2009). Additionally, as stated in common literature, retaining relevant variables does not always add significance to a regression model (Campos et al., 2005). This means the analysis for variable $MERCO_i$ is better when a relevant control variable is introduced, and the more relevant the less bias Model 1 would test for, meaning that a variable as relevant as GDP_i would allow for a bias analysis better than any other variable in Model 2.

4. Results

Concerning how CSR measures mark the price of a stock, Model 1 has provided the following results, which are presented as an average of all banks:

² Variable GDP has been subject of a modification, being reflected in monthly periods and in thousands of millions of euros.

Table 2

Relevant average statistics for Model 1.

Source: personal elaboration based on publications from the MERCO ESG Ranking from 2011 to 2019 (2020), data directly searched at [Bolsa de Madrid \(2020\)](#), and regression models as described in this paper.

Statistics	Median of results
R squared	0,8437
Adjusted R squared	0,8127
t Statistic	2,1879
F	4,2753

$$\hat{P}_i = 8.5315 + 0.0282(\overline{\text{MERC}}_i)$$

Results for Model 1 imply that for every 1000 points obtained in the MERCO ESG Ranking, the price of the bank's stock is expected to increase in 2.82 cents of euro. Therefore: there is a directly proportional relationship between the MERCO ESG Ranking, which measures the CSR measures implemented by a company, and the price of its stock: the higher the ranking, the higher the stock price.

Concerning the quality of the above model and its results, [Table 2](#) refers to the main statistics regarding quality.

In [Table 2](#) we can see that the coefficient of determination of Model 1, as measured by the *R squared* and the *Adjusted R squared*, is between 0,84 and 0,81: about 84–81% of the evolution (variance) in the stock price is explained by the evolution in the MERCO ESG Ranking. An *R squared* close to 1 (or 100% for this matter) shows good quality in a model, so the above result between 84% and 81% represents high relevance that states high quality for the model. In addition, the *t Statistic* measures the representativeness of the independent variable (MERCOS in this case): a *t Statistic* higher than “2”³ proves that a variable is relevant⁴ in a model. For Model 1, results show the independent variable (MERCOS) has a *t Statistic* of 2.1879, proving the MERCOS ESG Ranking is a representative and relevant variable in the price of the stock of a bank.

Following the same concept than the *t Statistic* in linear models with one variable, it is commonly understood that a variable is relevant in a model if the *F* value is higher than “4”.⁵ The above result is that the obtained *F* value is 4.2753, proving that, when it comes to explaining the evolution of the stock price of a bank, the MERCOS ESG Ranking is a representative variable.⁶

[Table 3](#) shows the coefficients and statistics of each individual bank's model do not differ much from the average numbers: Model 1 is always relevant for each bank upon statistics *R squared* and *Adjusted R squared*. Additionally, the independent variable (MERCOS) is always relevant (upon the *t Statistic* being always above 2); and the minimum value of the *F* statistic shows the model is representative.

In summary, (i) the impact of CSR measures in all 6 banks in our analysis is relevant and directly proportional: the higher the score on the MERCOS ESG Ranking, the higher the price of the stock; and (ii) consistency and significance is found in our results of the general impact of CSR measures for the model provides predictive values for the stock prices that are 84% or 81% similar to real values. Therefore: the MERCOS ESG Ranking, which refers to CSR measures, makes the prices of stocks of banks grow.

For Model 2, and using the same regression methods as in Model 1,

the following results have been obtained⁷:

$$\hat{P}_i = 7.1856 + 0.0003(\overline{\text{MERC}}_i) + 0.0461(\overline{\text{GDP}}_i)$$

Results for Model 2 mean that: (i) the price of the stock is expected to increase in 0,3 cents of euro for every 1000 points obtained in the MERCOS ESG Ranking; and, (ii) for every 1 million euro increase in the GDP, the price of a stock increases in 4.6 cents of euro. This shows both the GDP and the MERCOS ESG Ranking have a directly proportional relationship with stock prices, yet the result of the quality analysis for Model 2, using the same statistics that were used for Model 1, as shown in [Table 4](#), clarifies the relevance of each variable (that is, MERCOS and GDP).

[Table 4](#) shows that the determination coefficient for Model 2, as measured by the statistics *R Squared* and *Adjusted R Squared*, ranges from 90% to 88%. This means that around 90–88% of the evolution in the stock prices is explained by the evolution in the MERCOS ESG Ranking and the GDP. Still, the analysis of the *t Statistic* shows that the coefficient of the MERCOS ESG Ranking variable (β_1) is lower than 2, meaning low relevance or irrelevance, as opposed to the *t Statistic* of the coefficient for the GDP variable (β_2), which is higher than 2 and shows high relevance. Therefore: when measuring the impact of the MERCOS ESG Ranking on the share price, together with the impact of GDP, used as a measure of the economic context, the MERCOS ESG Ranking loses relevance and the greatest significance is for the economic context. This basically means that the stock prices for banks are highly influenced by the economic context or, so to speak, they are pro-cyclical variables, way more than CSR measures, up until the point that CSR measures lose all statistic relevance in comparison to the economic context.

5. Discussion: corporate social responsibility and social open innovation

Spanish banking is an example of digitization at an international level, as it is considered one of the most digitized banking in the world. So given the changes that digitalization implies for banks ([Vicente et al., 2020](#)), the implementation of ESG scores in the CSR strategy ([Gillan et al., 2021](#)) becomes a value that transmits confidence to investors. First, based on the results of the model used in this study, there is a direct and positive relationship between ESG scores and the stock price in the companies showing that MERCOS ESG Ranking makes the prices of bank stocks grow. Second, GDP and MERCOS ESG scores have a direct relationship with stock prices. Third, there is a relationship between the evolution in stock prices and the evolution in the MERCOS ESG Ranking and GDP. This paper shows impacts of CSR and ESG measures in companies from a positive perspective ([Garriga and Melé, 2004](#)) through specific results ([Gillan et al., 2021](#)). In fact, when measuring the impact of the MERCOS ESG Ranking on the share price, together with the impact of GDP, the MERCOS ESG Ranking loses relevance and the greatest significance is for the economic context. This means that CSR through ESG measures has low statistical relevance compared with the economic context but its qualitative impact on companies is high, in terms of reputation ([Clément et al., 2023](#)).

Despite the organizational changes that digitalization may entail, a continued CSR strategy implies a commitment to the company's ethical behavior, to transparency and good governance, to employees, to the environment and to the communities in which it operates ([Knaut, 2017](#); [Scholz, 2017](#); [Forcadell et al., 2020b](#)).

This study raises some managerial contributions in terms of fostering a continued CSR strategy. The first implication is that CSR is

³ In absolute value.

⁴ It is also pertinent to highlight that “relevance”, in statistics, does not mean “importance” ([Wasserstein & Lazar, 2016](#)). The fact that a variable is relevant simply means that the impact on other variable is higher than the error of the model, but such impact can be very low.

⁵ In absolute value.

⁶ These results are represented as an average of the results for the 6 banks in our analysis. [Table 4](#) contains a detailed table of the results for each bank.

⁷ It must be considered that all results in the case of Model 2 are shown in average values, as initially presented for Model 1. All conclusions from the analysis of such average values can be extrapolated to each company, given individual results of coefficients and statistics do not differ from average values.

Table 3

Individual results for each company in Model 1.

Source: personal elaboration based on publications from the MERCO ESG Ranking from 2011 to 2019 (2020), data directly searched at [Bolsa de Madrid \(2020\)](#) and regression models as described in this paper.

Company	β_0	β_1	R ²	Adj. R ²	t Stat.	F
Santander	8,8030	0,0280	0,8431	0,8122	2,2751	4,2724
CaixaBank	7,1730	0,0200	0,8405	0,8097	2,1621	4,2594
BBVA	13,2050	0,0420	0,8397	0,8089	2,1599	4,2551
Banco Sabadell	1,2060	0,0040	0,8371	0,8064	2,1534	4,2421
Bankinter	15,8460	0,0560	0,8363	0,8056	2,1512	4,2378
Bankia	4,9560	0,0190	0,8653	0,8336	2,2259	4,3850
Average	8,5315	0,0282	0,8437	0,8127	2,1879	4,2753

Table 4

Relevant average statistics for Model 2.

Source: personal elaboration based on publications from the MERCO ESG Ranking from 2011 to 2019 (2020), data directly searched at [Bolsa de Madrid \(2020\)](#) and regression models as described in this paper.

Statistics	Median of results
R squared	0.9019
Adjusted R squared	0.8856
t Statistic for β_1	1.1121
t Statistic for β_2	5.1689

shown to be a corporate asset that builds trust over time with stakeholders, especially, according to the findings of this study, with shareholders. In times of high volatility and uncertainty like the present, trust is an essential axis for companies to be more relevant to their stakeholders. According to the Edelman Barometer (2023), the crisis of trust in institutions and the polarization of many societies means that people are focusing more on companies and the connection with a social purpose beyond the business itself.

The second practical implication is related to the CSR strategy of companies having a positive impact measured by reputation rankings that evaluate CSR and ESG as a relevant variable, even the share price related to CSR is low. The growth of companies must be sustainable in financial and social terms because the management of the tangible and intangible must go hand in hand to ensure the company's long-term viability. Demonstrating the financial impact of CSR and ESG measures in a sector as fast-moving as banking demonstrates, with data, the importance of managing environmental, social and governance aspects integrated into the company's DNA (Gillan et al., 2021). This should serve as a case study for other banks and other sectors that do not yet see a clear return on a sustainable and continued investment in CSR and sustainability.

The third implication of this research is that, although the impact is modest, different investors evaluate companies with a CSR strategy been more attractive in the global market. Becoming a guiding light and providing stability places high expectations on the management of companies by their stakeholders (Edelman, 2023). Therefore, CSR represents a value for shareholders because, although companies are not perfect, it guarantees a concern for sustainable growth and innovation on the part of management. Here the role of the CEO is key as the guarantor of ethical management and concern for the company's role in society to make the world a better place.

A fourth implication is to point out that CSR is the way of providing solutions to social problems by companies. From an academic perspective, this implies that CSR is strategic for companies due to its direct contribution to sustainable development. It is therefore essential that academic research continues to provide society with the most innovative solutions that can contribute to growth and improve people's lives (Ouechtati et al., 2022). In addition, it is important that governments also favours the creation, maintenance and evolution of innovation ecosystems with a focus on the improvements that open

innovation can generate at social and business level (De Souza and Granados, 2023).

6. Conclusions

Innovation is considered a source of growth for society (Rubalcaba and Solano, 2023), although it also generates tensions (Kimpimäki et al., 2022) when it comes to implementing the new technologies involved in digitalisation (Bhatt et al., 2016) and the knowledge management that this entails (González-Ramos et al., 2023). It is therefore necessary to encourage a critical attitude to innovation (Pittz and Adler, 2023), which will be richer and more productive if it is open and accessible to society as a whole so that results are accelerated (Abhari et al., 2022; Abhari and McGuckin, 2023). In this sense, several authors point out that the most innovative companies have a clear social focus that promotes the sustainable development of the company (Du et al., 2022; El Ghouli et al., 2023) and that, consequently, they favour greater trust among their stakeholders (Lyu et al., 2023).

The main benefits of digitalization are related to favouring economies of scale, augmenting the competitiveness of companies, increasing profits, enhancing competitive advantage, developing new products and/or services designed to meet people's needs, improving the efficiency of resources or favouring greater flexibility and agility of companies (Mirković et al., 2019; European Commission, 2020). In the banking sector, given the relationship between financial access and GDP per capita (Aracil, 2018), the benefits of digitization are also associated with some aspects, such as greater financial inclusion, an improvement in the quality of life of people and in favouring better transparency and good corporate governance (Aracil, 2018; European Commission, 2020; Bouncken and Kraus, Yukhno, 2021, 2021). This paper also analyzes the relationship between CSR, digitalization and reputation in the banking industry (Fombrun, 1996; Wang et al., 2003; Starešinić et al., 2019; Forcadell et al., 2020a) considering that reputation is relevant in the digital environment (Hearn, 2010; Ruiz and García, 2021) to enable growth for companies (Doorley and Garcia, 2015).

Consequently, the hypothesis (H1) that a CSR strategy continued over time has a positive impact on the share price of companies that, like Spanish banks, have undergone major transformations due to digitalization can be confirmed because: (i) There is a directly proportional relationship between the MERCO ESG Ranking and the share price of the companies of the sample. Therefore, this relationship is measurable and, we can conclude that the price of the stock of banks increases by 2.8 cents of euro for every 1000 points obtained by a company in the MERCO ESG. Therefore, this research provides empirical data on the relationship between CSR, digitalization, and price of banks in the stock market. (ii) Still, such relationship loses relevance when considering the economic context for banks are very pro-cyclical companies that follow the evolution of the general economy. Furthermore, the methodology reflects how CSR impacts the share prices of banks and how relevant the impact is. Hence, it can be concluded that the impact is relevant when measured in isolation. However, considering the influence of the overall

economic context in the banking sector, the relevance of CSR measures is minimized. This conclusion is logical because banks, as intermediaries in economic transactions, do depend on the economic context. Accordingly, CSR can only contribute a small part of influence and, although a direct impact is detected, the economic context reduces the impact of CSR to modest. All these aspects, CSR strategies and the evolution in the process of digitalization of banks, contribute to the market value of companies and their impact on reputation improving relationships with shareholders and other stakeholders (Freeman, 2010; Muliani et al., 2020; Dmytriyeu et al., 2021) in this industry.

This paper has some limitations. The first one refers to the sample used, since it only covers the study of 6 banks, so the results have a small scope. The second limitation refers to the country of the sample, since they are only Spanish banks, therefore, the results refer only to a specific context. And the third limitation refers to the analysis provided by a single reputation ranking also located in the Spanish context.

Given that the future of banking is digital, it is important to point out that, in general terms, the benefits of banking digitalization are translating, on the one hand, into greater competitiveness, more flexibility and agility, as well as the creation of new services and business models; and on the other hand, in social benefits such as those related to favoring greater financial inclusion of the population, increasing GDP per capita, and helping with people's own digitization, teaching them to manage their finances through the Internet in times of pandemic (Aracil, 2018; European Commission, 2020).

This research aims to help banks and companies in other sectors that are in a process of digital transformation so that, at a time of so much change, their CSR strategy is the rudder that guides the different innovations that are implemented. In addition, the impact on the share price can be a factor that can be raised with the boards of banks or other companies to continue working towards sustainable development or to start working on it. Indeed, as with open-source software, innovations implemented at the digital level could be shared among industry associations and academic institutions in ways that contribute to societal improvement and sustainable growth.

Future research can help to understand better the behavior of companies in other industries and comparing results in different countries based on other reputation rankings and its methodology, such as Reprack by Reputation Institute. Moreover, future studies can analyze different periods of time comparing conclusions to better understand the impacts of digitalization on transparency and reputation in different companies. Finally, other studies can analyze other relevant variables that contribute to a better understanding of the impacts of CSR and how they increase business transparency and its global value in the market.

Additionally, future research can work on more in depth measurements of digitalization within the banking sector and its impact in the share price of banking entities. This refers to the fact that the independent variable in the model contained in this research, the MERCO Index, mixes the effect of digitalization measures together with other CSR measures. Therefore, isolating digitalization measures and its isolated impact in the shared price is a challenge to be addressed in further analyses.

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Declaration of Competing Interest

None.

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