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Strategic ESG Reporting: Advancing Operational Risk Management in Europe's Innovative Banking Sector¹

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Abstract

Sustainability concerns extend beyond traditional businesses, enveloping the banking sector where stakeholders exert considerable pressure for robust environmental, social, and governance (ESG) disclosures. This study delves into the impact of ESG reporting on the operational risk management within European banks. By scrutinizing ESG disclosure practices across 192 EU27-listed banks from 2009 to 2019, the investigation reveals a tangible influence of ESG practices on operational risk. The findings underscore the value of enhanced transparency and accountability, indicating that diligent ESG reporting can lead to marked improvements in managing banking risks.

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1 Introduction

The concept of CSR in the financial sector refers not only to the responsibility of companies for the effect that their actions have on stakeholders, but also to the role of companies as financial intermediaries (Prior & Argandoña, 2009), especially after the financial shock that occurred with the sub-prime mortgage crisis which led to calls for responsible conduct in the financial sector (Cornett, Erhemjamts, & Tehranian, 2016).

In the exercise of their institutional activity, as is known, banks are exposed to different types of risk: one of these is the Operational Risk represented by the possibility that the financial activity is subject to fluctuations in value that arise during the normal operations of a bank.

Banks provide financial services (Greenbaum & Thakor, 2007) by means of operational and financial activities that require the production and processing of information and the connection between them.

At the corporate level, sustainability is usually represented by characteristics of environmental, social, and governance practices that directly influence the global sustainability aspect (Semenova & Hassel, 2015; Friede, Busch, & Bassen, 2015). Otherwise, banks as financial intermediaries cannot directly influence sustainable development, yet, in their financial services and through banking operations, they can take into account the environmental, social, and governance characteristics and policies of companies and organizations in political internal and in the decisions related to them, including in financing decisions. Unfortunately, banking risk management does not always serve to obtain satisfactory results, as macroeconomic factors interact with the economic system through their balance sheets and their operations on the financial markets.

Therefore, to manage risks and organize financing, financial authorities monitor and regulate both individual banks, markets, and the financial system as a whole (Greenbaum & Thakor, 2007). In the econometric models used, it was decided to also include macroeconomic variables to also evaluate the influence of the macroeconomic system.

The contribution is divided as follows: paragraph 2 illustrates the literature that leads to the research hypotheses; paragraph 3 reports the empirical analysis in terms of the survey methodology used and the sample under examination; section 4 reports the main findings and offers a discussion of the findings and concluding remarks.

2 Literature review and hypothesis development

2.1 CSR disclosure and bank risk

Since the sub-prime mortgage financial crisis, financial institutions, in particular banks, have received strong pressure as they are called upon to recognize and observe their obligations towards society (Matten, 2006; Money & Schepers, 2007; Gill, 2008; Grove et al., 2011).

According to the World Bank, “corporate social responsibility is the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large to improve their lives in positive ways for the business and for development” (Starks, 2009, p. 465).

From a strictly corporate point of view, CSR can have both financial and strategic advantages as corporate engagement in social activities develops greater trust from stakeholders, thus offering competitive advantages (Aguilera, Williams, Conley, & Rupp, 2006; Money & Schepers, 2007; Gill, 2008).

The concept of CSR in the financial sector refers not only to the responsibility of companies for the effect that their actions have on stakeholders, but also to the role of companies as financial intermediaries (Prior & Argandoña, 2009). De la Cuesta-González, Muñoz-Torres, and Fernández-Izquierdo (2006) believe that CSR impacts the financial sector in two different ways: firstly in the internal dimension, which involves the implementation of environmentally and socially responsible initiatives within internal management procedures, and secondly in an external dimension, which implies the incorporation of corporate social responsibility into financial intermediation and investments in financial markets. The internal dimension that provides information on CSR in Financial Institutions appears in the “Impact of products and services” section of the supplementary part of the SGR FSS (Global Reporting Initiative, 2023: <https://www.globalreporting.org>). This dimension of designing and implementing procedures for the assessment and screening of environmental and social risks in operational lines is extremely important as relationships with stakeholders are based on a positive exchange of benefits (Baer & Haase, 2020). For this reason research suggests that reporting on CSR promotes the image of companies and improves their reputation (Gray, Kouhy, & Lavers, 1995; Vanhamme, Lindgreen, Reast, & van Popering, 2012).

Sustainable commitment banking is shown to reduce the risk of business performance being negatively affected by labor disputes, product safety scandals, and consumer fraud (Waddock & Graves, 1997). Therefore, companies with high standards of sustainable operating practices are subject to lower specific risks due to lower variability in cash flows (Salama, Anderson, & Toms, 2011). For this reason,

the bank's corporate strategy and risk management (Mengze & Wei, 2015) should necessarily take CSR into account.

Previous research suggests that sustainable engagement and reporting can influence corporate risks and profitability, as investors increasingly analyze their social behavior as a determinant of investment choice (Simpson & Kohers, 2002; Aguilera, Williams, Conley, & Rupp, 2006) and considering that CSR incorporates multidimensional aspects, it may happen that the effects of one dimension prevail over the effects of the others or even cancel out the effects on the other; therefore, it is useful to have disaggregated data.

It was therefore decided to also use Bloomberg's ESG Disclosure Score both aggregated and disaggregated into its three components: environmental, social, and governance and to analyze their link to banking operational risk (Gambetta, García-Benau, & Zorio-Grima, 2017; Galletta, Goodell, Mazzù, & Paltrinieri, 2023) as it is less discussed than credit risk (Wu & Shen, 2013; Henisz & McGlinch, 2019; Mendiratta, Varsani, & Giese, 2021; Gaganis, Pasiouras, & Tasiou, 2023) and liquidity risk (Gambetta, García-Benau, & Zorio-Grima, 2017; Liang, Xue, & Zhang, 2023; Zhao, 2023) despite the relevance of some studies conducted by Perry and de Fontnouvelle (2005) and Fiordelisi, Schwizer, and Soana (2014) which underline that operational risks can lead to significant financial losses caused by a significant capital absorption.

Based on the aspects examined, the following research hypotheses were formulated:

- H1 There is a positive and significant relationship between the disclosure level of the ESG and Operating Income.
- H1a There is a positive and significant relationship between the disclosure level of environmental issues and Operating Income.
- H1b There is a positive and significant relationship between the disclosure level of social issues and Operating Income.
- H1c There is a positive and significant relationship between the disclosure level of governance and Operating Income.

3 Empirical analysis

3.1 Methodology

To test the research hypotheses, we examine the impact of the overall score developed by Bloomberg as a proxy for ESG disclosure and also a set of macroeconomic and bank-specific variables on operating income.

The analysis is conducted by performing multivariate regressions with panel data over the time horizon 2009-2019. In order to better capture the non-financial effect of reporting activities, we delayed the independent variables of the ESG score (both aggregated and split) by 1 year. The least squared ordinary model (OLS) is supported by the results of the collinearity (see Appendix A) and heteroskedasticity tests (for further details, please see Appendix A); in particular, the variance inflation factor (VIF) was used to verify the multicollinearity and the With Test to verify that the model was not ruined by heteroskedasticity. In order to improve the accuracy and consistency of the estimates, the Hausman Test is carried out to support the choice between panel analysis with fixed or random effects and the analysis is performed with robust standard errors. The main independent variables are delayed by a period, in order to limit the problems of endogeneity.

$$\ln_OI_{it} = \beta_0 + \beta_1 SGR_{it} + \beta_2 NIM_{it} + \beta_3 \ln SIZE_{it} + \beta_4 COV_{it} + \beta_5 CR_{it} + \beta_6 INFL_{it} + \beta_7 GDP_{it} + \beta_8 UNE_{it} + \beta_9 ESG_{it-1} + \varepsilon_{it} \quad (1)$$

$$\ln_OI_{it} = \beta_0 + \beta_1 SGR_{it} + \beta_2 NIM_{it} + \beta_3 \ln SIZE_{it} + \beta_4 COV_{it} + \beta_5 CR_{it} + \beta_6 INFL_{it} + \beta_7 GDP_{it} + \beta_8 UNE_{it} + \beta_9 ED_{it-1} + \beta_{10} SD_{it-1} + \beta_{11} GD_{it-1} + \varepsilon_{it} \quad (2)$$

3.2 Regression variables

The variable under study is operational risk and is difficult to define due to its multidimensional nature (Sturm, 2013). However, Operational Banking Risk is chosen to measure through Operating Income (Gambetta, García-Benau, & Zorio-Grima, 2017).

3.2.1 Control variables

The SGR (Sustainability Growth Rate) variable is used to analyze the sustainability of the bank's growth without resorting to debt; the NIM (Net Interest Margin) variable represents the bank's profit margin (Salas & Saurina, 2002); the variable $\ln SIZE$ ($\ln_Total Assets$) represents the size of the bank

(Bussoli, Conca, Gigante, & Madaro, 2016); the variable COV (Loan loss reserves/Gross Loans) assesses the extent to which the banking sustainability relating to the losses of loans originated in the exercise of credit; and the variable CR (Total Capital Ratio) represents the capital adequacy coefficient (Bussoli, Conca, Gigante, & Madaro, 2016).

3.2.2 Macroeconomic variables

For the macrosystemic aspect it was decided to use the variable GDP (Gross Domestic Product) since it is one of the primary indicators used to measure the health of a country's economy (Jiménez & Saurina, 2005; Rinaldi & Sanchis-Arellano, 2006; Boudriga, Boulila Taktak, & Jellouli, 2009; Bofondi & Ropele, 2011; Nkusu, 2011; Klein, 2013; Škarica, 2014; Bussoli, Conca, Gigante, & Madaro, 2016; Salvi, Bussoli, Conca, & Gigante, 2018); the UNE variable (unemployment) represents the unemployment rate of the countries analyzed (Bofondi & Ropele, 2011; Nkusu, 2011; Klein, 2013; Makri, Tsagkanos, & Bellas, 2014; Škarica, 2014) and the variable INFL (Inflation) represents the inflation rate of each Member State (Rinaldi & Sanchis-Arellano, 2006; Bofondi & Ropele, 2011; Nkusu, 2011; Klein, 2013; Makri, Tsagkanos, & Bellas, 2014; Nkusu, 2011; Škarica, 2014).

3.2.3 Independent variables

It was decided to use an overall score developed by Bloomberg as a proxy for ESG reporting (Gutsche, Schulz, & Gratwohl, 2017).

Given its credibility, this delegation is also commonly applied in business practices.

In addition, it was also decided to divide the ESG disclosure score into its individual components: ESG, to investigate the different weights of the information on the various issues. Bloomberg indicators were preferred because, according to the provider, the score is calculated directly on the basis of information disclosed by the banks.

3.3 Sample

The analysis was conducted on a sample made up of 192 European listed banks considered in the period 2009-2019. The data is annual. The final dataset includes an unbalanced panel of active banks present in the 27 states of the European Union (EU27). Financial data is obtained from the BankFocus database and Bloomberg ESG data.

Tables 1 and 2 report the main descriptive statistics of the variables under study and the correlation analysis. In addition, the VIF test was performed to avoid any multicollinearity problems, while the White Test (White, 1980) for heteroskedasticity (for detailed results, please see Appendix A).

Table 1 – Descriptive statistics (2010–2018)

Variable	Mean	Standard Deviation
ln_OI	6.41	1.65
SGR	4.93	4.95
NIM	0.18	0.02
ln SIZE	9.37	1.82
COV	0.30	0.05
TCR	12.50	7.14
INFL	1.32	1.25
GDP	103.64	10.21
UNE	25.44	14.14
ED	33.24	18.13
SD	44.93	17.14
GD	52.12	17.43
ESGD	36.54	18.88

Source: our elaboration

Table 2 – Correlation Matrix (2009-2019)

Variable	ln_OI	SGR	NIM	ln_SIZE	COV	TCR	INFL	GDP	UNE	ED	SD	GD	ESGD
ln_OI	1												
SGR	-0.124	1											
NIM	-0.788	0.058	1										
ln_SIZE	0.978	-0.124	-0.866	1									
COV	-0.486	-0.033	0.618	-0.541	1								
TCR	0.300	0.024	-0.433	0.357	-0.545	1							
INFL	-0.118	0.090	0.161	-0.143	0.069	-0.009	1						
GDP	-0.018	0.290	-0.136	0.009	-0.139	0.168	0.216	1					
UNE	0.116	-0.281	0.075	0.082	0.148	-0.284	-0.082	-0.431	1				
ED	0.230	-0.147	0.059	0.171	0.071	0.002	-0.011	-0.241	0.229	1			
SD	0.183	-0.032	0.045	0.133	0.041	0.039	-0.012	-0.117	0.284	0.686	1		
GD	0.247	-0.022	0.013	0.201	0.076	-0.057	-0.049	-0.140	0.295	0.555	0.501	1	
ESGD	0.265	-0.098	0.047	0.203	0.065	0.004	-0.036	-0.203	0.302	0.901	0.840	0.761	1

Note. Correlation is significant at the 0.05 level (2-tailed).

Source: our elaboration

3.4 Results

The Pooled OLS model is supported by the results of collinearity and heteroscedasticity analysis. The Collinearity test allowed to exclusion of problems of collinearity between the variables, while the heteroscedasticity problem was resolved through further analyses with robust standard errors. Table 3 illustrates in detail the results deriving from the panel analysis referring to the dependent variable OperatingIncome expressed in natural logarithm. From the results of the Hausman Test, it is decided to consider the Panel model with Fixed Effects. Furthermore, to limit endogeneity problems, a one-year lag period is carried out on the main dependent variables.

Table 3 illustrates in detail the regression coefficients and test statistics, deriving from the panel analysis. Focusing on the results of the ESG Disclosure Score, the empirical analysis reveals a statistically significant positive relationship with operating income. Therefore, the results obtained allow us to state that the research hypothesis H1 is verified.

With particular reference to the economic-financial indicators, there is also a statistically significant positive relationship between operating income and the size of the banks (lnSIZE) – highlighting how the expansion of the size of banking institutions can positively affect operating income. Furthermore, there is a statistically significant positive relationship between the dependent variable and the interest margin (NIM in Table 2), underlining how a greater profit margin achieved by the bank can be associated with an increase in operating income. Regarding macroeconomic variables, there is a direct relationship between inflation and operating income.

The analysis was replicated by breaking up the ESG Disclosure score into the individual components. The evidence reported in Table 4 (with reference to the model with *Fixed effects*) shows a negative relationship between the Social Disclosure Score and operating income. On the contrary, there is a positive relationship between Governance Disclosure and operating income. From the results, we can say that the hypotheses H1a and H1b are not verified, but the hypothesis H1c is verified.

This analysis confirms the statistically significant relationship between inflation and operating income and the bank-specific variables are all significant. In particular, there is a positive impact on operating income in the case of SGR, NIM, lnSIZE and COV. Otherwise, a negative relationship with the Total Capital Ratio.

Table 3 – Regression Model – ln_OI with ESG Disclosure Score (2009-2019)

Pooled OLS ln_OperatingIncome				Fixed Effect ln_OperatingIncome				Random Effect ln_OperatingIncome			
	<i>coeff.</i>	<i>p-value</i>			<i>coeff.</i>	<i>p-value</i>			<i>coeff.</i>	<i>p-value</i>	
cost	-1.638 (0.587)	0.000	***	cost	-3.106 (0.744)	0.000	***	cost	-1.893 (0.658)	0.004	***
SGR	0.006 (0.002)	0.000	***	SGR	0.004 (0.003)	0.228		SGR	0.006 (0.003)	0.048	**
NIM	0.956 (0.076)	0.000	***	NIM	0.900 (0.169)	0.000	***	NIM	0.951 (0.165)	0.000	***
lnSIZE	0.858 (0.006)	0.000	***	lnSIZE	0.858 (0.011)	0.000	***	lnSIZE	0.858 (0.011)	0.000	***
COV	0.098 (0.037)	0.000	***	COV	0.115 (0.082)	0.162		COV	0.100 (0.086)	0.244	
CR	-0.003 (0.001)	0.000	***	CR	-0.003 (0.002)	0.147		CR	-0.003 (0.002)	0.086	*
INFL	0.034 (0.009)	0.000	***	INFL	0.071 (0.020)	0.000	***	INFL	0.037 (0.010)	0.000	***
GDP	-0.096 (0.123)	0.435		GDP	0.204 (0.54)	0.188		GDP	-0.043 (0.134)	0.748	
UNE	-0.002 (0.001)	0.104		UNE	0.000 (0.001)	0.856		UNE	-0.001 (0.001)	0.158	
ESG_1	0.002 (0.001)	0.000	***	ESG_1	0.002 (0.001)	0.000	***	ESG_1	0.002 (0.001)	0.000	***
<i>R² Adj</i>				<i>R² LSDV</i>				Hasman: P value = P ($\chi^2(9) > 45.28 = 0.00$			
<i>Obs</i>				<i>Obs</i>				Sum of residual squares			
<i>F(9, 1594)</i>				<i>Obs</i>				292.79			
<i>P value(F)</i>											
0.977				0.981							
1608											
7512.25											
0.000											

Note. The numbers in italics are standard error. Abbreviations: OLS, ordinary least square. Level of significance *10%; **5%; ***1%.

Source: our elaboration

Table 4 – Regression Model – ln_OI with Environmental, Social and Governance Disclosure Scores (2009-2019)

Pooled OLS ln_OperatingIncome				Fixed Effect ln_OperatingIncome				Random Effect ln_OperatingIncome			
	<i>coeff</i>	<i>p-value</i>			<i>coeff.</i>	<i>p-value</i>		<i>coeff.</i>	<i>p-value</i>		
cost	-0.9354 (0.65)	0.152		cost	-2.337 (0.872)	0.000 ***		cost	-1.504 (0.791)	0.057 *	
SGR	0.0114 (0.002)	0.000 ***		SGR	0.011 (0.003)	0.003 ***		SGR	0.011 (0.003)	0.000 ***	
NIM	0.9595 (0.089)	0.000 ***		NIM	0.913 (0.181)	0.000 ***		NIM	0.949 (0.183)	0.000 ***	
lnSIZE	0.8681 (0.007)	0.000 ***		lnSIZE	0.867 (0.011)	0.000 ***		lnSIZE	0.868 (0.011)	0.000 ***	
COV	0.1783 (0.043)	0.000 ***		COV	0.214 (0.093)	0.023 **		COV	0.185 (0.098)	0.058 *	
CR	-0.0048 (0.001)	0.001 ***		CR	-0.003 (0.002)	0.084 *		CR	-0.004 (0.002)	0.046 **	
INFL	0.0319 (0.011)	0.003 ***		INFL	0.064 (0.020)	0.001 ***		INFL	0.038 (0.012)	0.002 ***	
GDP	-0.2583 (0.137)	0.059 *		GDP	-0.001 (0.001)	0.921		GDP	-0.142 (0.160)	0.373	
UNE	-0.0028 (0.001)	0.007 ***		UNE	-0.001 (0.001)	0.120		UNE	-0.002 (0.001)	0.008 ***	
ED_1	0.0013 (0.001)	0.180		ED_1	-0.000 (0.001)	0.987		ED_1	0.001 (0.001)	0.469	
SD_1	-0.0029 (0.001)	0.005 ***		SD_1	-0.004 (0.001)	0.000 ***		SD_1	-0.003 (0.001)	0.003 ***	
GD_1	0.0029 (0.001)	0.002 ***		GD_1	0.005 (0.001)	0.000 ***		GD_1	0.003 (0.001)	0.000 ***	
<i>R^2 Adj</i>								<i>R^2</i>			
								Hasman: P value = P (χ2(11) >			
<i>Obs</i>								54.8726 = 0.00			
<i>F(11,1296)</i>								Sum of residual squares 183.86			
<i>P value(F)</i>											

4 Conclusion and Discussion

The study highlighted some interesting considerations on the sustainability of the banking sector in Europe and the role of non-financial disclosures in influencing banking Operational Risk.

In particular, the existence of a significant relationship between ESG information score and Operational risk of listed banks in Europe was examined; similarly, the relationship between the individual dimensions that make up Bloomberg's ESG information was investigated, in order to analyze whether there is a measure that affects the subject under study more than others. Furthermore, the analysis was carried out by inserting macroeconomic determinants into the econometric model since the study of the documented influence of the macroeconomy on banks is inviting (Barth, Caprio, & Levine, 1999; Bikker & Hu, 2002; Bikker & Metzmakers, 2005; Baele, De Jonghe, & Venet, 2007; Wagner, 2007; Somoye & Ilo, 2009; Nijskens & Wagner, 2011).

European countries are the leading countries when it comes to support sustainable development. Banks listed in European Union countries were selected as the object of the research because they support social and economic development. Currently, the banking sector plays an important role in the development and growth of the European economy.

In light of the empirical results obtained, this work suggests that European banks should continue to report their sustainable commitment through disclosure (Galletta, Goodell, Mazzù, & Paltrinieri, 2023).

In fact, it has been shown that operating income appears to have a positive relationship with the ESG Disclosure Score and the Governance Disclosure Score.

Therefore, the findings have important managerial implications considering the potential impacts of ESG disclosure, as well as for banks considering how to disclose ESG-related information. The findings suggest that non-financial reporting plays a key role in improving the efficiency of risk management, which in turn can have significant consequences for the financial economy.

The contribution, despite having a broad evaluative vision, represents a preliminary version of the work that will be carried out by expanding the reference time horizon and overcoming the limits deriving from the period analyzed which concerns the pre-Covid period. In fact, it would be useful to analyze the impact of ESG Disclosures from 2019 onwards. The period studied does not include the further economic/financial shock post-economic crisis resulting from the pandemic. It would be interesting to include time dummies by extending the time horizon and analyzing the differences between the effects of the subprime mortgage crisis and the consequences of the pandemic in the financial sector. Furthermore, it could be interesting, given the difficulty of quantifying Operational Risk (Sturm, 2013), to use another variable for the object of study for comparison and for a more robust analysis (BCBS, 2006).

Among the future perspectives, the objective is to deepen the analysis through the use of a dynamic panel model and verify the research hypotheses by distinguishing by type of bank and moving from a financial to an operational perspective, evaluating the market response in light of stakeholder theory.

APPENDIX A

Table A1 – Variance inflation factor (VIF) test

SGR	1,119	SGR	1,173
NIM	5,124	NIM	4,872
ln_SIZE	4,382	ln_SIZE	4,125
COV	1,979	COV	1,955
TCR	1,457	TCR	1,424
INFL	1,103	INFL	1,083
GDP	1,353	GDP	1,388
UNE	1,385	UNE	1,486
ESGD	1,031	ED	2,278
		SD	2,015
		GD	1,608

Source: our elaboration

Table A2 – White test

$$\text{OLS model (1)} \quad \ln_OI_{it} = \beta_0 + \beta_1 SGR_{it} + \beta_2 NIM_{it} + \beta_3 \ln SIZE_{it} + \beta_4 COV_{it} + \beta_5 CR_{it} + \beta_6 INFL_{it} + \beta_7 GDP_{it} + \beta_8 UNE_{it} + \beta_9 LIQU_{it} + \beta_{10} ESG_{it-1} + \varepsilon_{it}$$

$$P \text{ value} = P(\chi^2(54) > 592,27) = 0.00$$

$$\text{OLS model (2)} \quad \ln_OI_{it} = \beta_0 + \beta_1 SGR_{it} + \beta_2 NIM_{it} + \beta_3 \ln SIZE_{it} + \beta_4 COV_{it} + \beta_5 CR_{it} + \beta_6 INFL_{it} + \beta_7 GDP_{it} + \beta_8 UNE_{it} + \beta_9 LIQU_{it} + \beta_{10} ED_{it-1} + \beta_{11} SD_{it-1} + \beta_{12} GD_{it-1} + \varepsilon_{it}$$

$$P \text{ value} = P(\chi^2(77) > 609,52) = 0.00$$

Source: our elaboration

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