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Mandatory non-financial reporting in the banking industry: assessing reporting quality and determinants

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Abstract: European companies that are larger than a specific size have had to comply with reporting requirements on non-financial topics since 2017 under the European Union's Non-Financial Reporting Directive (2014/95/EU), thereby making non-financial reporting (NFR) mandatory. To the best of the author's knowledge, no study has examined the quality of non-financial reporting in banks' compulsory reports over several years. Therefore, the unique objective of this study is to assess the non-financial reporting quality (NFRQ) in the mandatory NFR of the 100 largest banks operating in Germany over three years, and identify reporting-level determinants (experience, format, framework, and audit) that impact NFRQ. A novel framework is developed to measure NFRQ, and different statistical analyses are used to test hypotheses. This study provides notable results: (1) NFRQ in banks' mandatory reporting is below average despite displaying significant positive development over the years; and (2) banks' NFRQ is significantly impacted by three reporting-level determinants (experience, format, and framework). Additionally, this study highlights meaningful implications for theory, practice, and policy on the future of mandatory NFR in the EU.

Subjects: Banking; Accounting; Corporate Social Responsibility

Keywords: banks; corporate social responsibility (CSR); Directive 2014/95/EU; Germany; mandatory; non-financial reporting; reporting quality

1. Introduction

Organizations are critically perceived in terms of their social and environmental impacts, thus making corporate social responsibility (CSR) essential for business management (Porter & Kramer,

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PUBLIC INTEREST STATEMENT

For several years now, most large companies in the European Union have been required to publish their non-financial information in corresponding reports and defined criteria. However, very little is known about the non-financial reporting quality. Therefore, this study assesses reporting quality based on 300 non-financial reports. This study examines the following questions: (1) How has reporting quality developed over time, and (2) which factors influence reporting quality? Finally, recommendations are presented to the reader on improving non-financial reporting quality.

2006). While CSR does not have a widely accepted definition (Martínez et al., 2016), the European Commission (EC) views CSR as "the responsibility of enterprises for their impacts on society" (2011, p. 6). Furthermore, the EC broadly defines the concept as organizations working closely with their stakeholders to integrate social, environmental, ethical, human rights, and consumer concerns into their business operations and core strategies (European Commission, 2011). By conceptualizing CSR, the EC emphasizes the importance of collaborating with stakeholders, their long-term value creation, and incorporating environmental and social imperatives. Hence, it can be stated that companies exist to benefit society.

Companies have a variety of communication channels to relay CSR-related information (e.g., website, social media sites, press releases, or advertising). In recent decades, the number of companies that disclose CSR-related information has increased substantially (KPMG, 2020). Non-financial reporting (NFR) allows companies to display their strategies, policies, and performance in terms of their environmental and social impacts on stakeholders (Dumay, 2016) [1]. Additionally, it enables organizations to meet distinct information needs, respond to external pressures, and make more conscious decisions (Carini et al., 2018; Dumay et al., 2015), that represent a way to manage reputational risks and achieve an increased level of legitimacy (Chen et al., 2008; Deegan, 2002).

Following several attempts to advance the reporting quality of voluntary NFR, the EC made NFR mandatory by introducing Directive 2014/95/EU (hereinafter "the Directive"). The Directive marks a turning point as affected companies have been required to publish non-financial information (NFI) annually since its transposition into the national law of the European Union (EU) member states (La Torre et al., 2018). While no universally accepted definition exists for NFI, the term broadly refers to CSR-related aspects (Haller et al., 2017).

With the Directive's introduction, new strands of NFR research have emerged, addressing accountability, reporting practices, and regulation (Korca & Costa, 2021). While a few studies have assessed the NFR of the year before and after the Directive's implementation (e.g., Dumitru et al., 2017; Matuszak & Rózańska, 2017), only Tarquinio et al. (2020) have analyzed the reporting practices two post the introduction of the Directive. This study aims to contribute to the literature on mandatory NFR in Europe, which is sparse in terms of knowledge concerning reporting quality (e.g., Carungu et al., 2020; Mion & Loza Adaui, 2019) and its influence (e.g., Dyduch & Krasodomska, 2017). Meanwhile, the assessment of non-financial reporting quality (NFRQ) is considered a complex, multi-layered, and subjective concept. Hence, a single definition of reporting quality or a sound theoretical framework does not exist yet (Hahn & Kühnen, 2013; Helfaya et al., 2019).

The study of reporting quality in mandatory NFR of banks from Germany is relevant for several reasons. First, the banking industry has generally been excluded from research studies examining non-financial reporting (Kiliç et al., 2015). To the best of the author's knowledge, no study addresses the reporting quality of non-financial bank reports in the wake of the Directive and examines its determinants. Thus, the study provides unique results to better understand non-financial reporting behavior. Second, the German banking sector investigation is particularly significant because it has the highest number of banks, the most employees, and the second most assets under management among all EU member states (Eurostat, 2020). Therefore, it can be assumed that the Directive has affected large international banks from Germany and applies to numerous medium-sized and small banking organizations. Thus, the results of this study may also be relevant to other banking sectors in the EU. Third, German banks' recent surveys on mandatory non-financial reporting have provided contradictory results. On the one hand, large banks achieved top NFR results than large companies in other industries (IÖW, 2019). Simultaneously, a survey that looked only at mandatory NFR by banks found that there is room for improvement (Zielke Research Consult, 2020). Therefore, this study contributes to the scientific assessment of NFRQ by banks from Germany and the advancement of NFR research.

Based on these reasonings, the objectives of this study are as follows: (1) constructing a robust framework to assess NFRQ; (2) measuring banks' NFRQ across a three-year research period (2017–2019); and (3) identifying whether reporting-level determinants (experience, format, framework, and audit) have an impact on NFRQ.

The remainder of this paper is structured as follows. The following section provides an overview of the NFR requirements in Germany. Section 3 presents a literature review on the quality of non-financial reporting, followed by the theoretical framework, and states the research hypotheses. Section 4 details the constructed NFRQ assessment framework, sample selection, and data analysis methods. Section 5 reports the empirical results. Section 6 discusses the results and outlines the implications for the theory, practice, and policy. Finally, section 7 provides the conclusion, limitations, and recommendations that could aid future research.

2. Reporting requirements in Germany

Before the Directive's transposition into German legislation, companies voluntarily disclosed non-financial issues for several years. Traditionally, organizations in Germany generally reported on environmental and employee-related matters. However, reports on other issues such as stakeholder communication, human rights, and bribery were less prevalent (Gulenko, 2018). Comprehensive legislation on environmental and social reporting remained absent in Germany.

To strengthen NFR, *the Bundestag* (the lower house of the German parliament) passed the transposition of the Directive into German law via the CSR Directive Implementation Act (CSR-DIA) in April 2017 (Bundestag, 2017). Accordingly, capital-market-oriented companies and organizations with more than 500 employees per year, total assets of 20 million euros (EUR), or a total turnover of 40 million EUR, are affected by the CSR-DIA. As of the fiscal year 2017, more than 500 companies in Germany, most of them from the banking sector, were required to report NFI annually (Accounting Standards Committee of Germany, 2021; Hoffmann et al., 2018).

Affected companies need to provide NFI on the following five topics: the environment, employees, society, respect for human rights, and efforts to combat corruption and bribery. The report should include a description, results, and risks regarding each topic. Although the regulation mentions multiple subtopics and examples for each non-financial theme, neither scope requirements nor quality and depth of content are specified (Hoffmann et al., 2018).

Regarding the reporting format, affected companies can freely choose whether to combine the disclosed NFI with the management report (the integrated report) or publish these separately from the management report. Regardless of the chosen reporting format, both the combined and separate reports should meet the exact minimum reporting requirements.

The CSR-DIA does not require an explicit reporting framework, thereby allowing companies to choose from a range of international (e.g., the Global Reporting Initiative, GRI), national (e.g., German Sustainability Code GSC), or industry-related frameworks (e.g., reporting standard of the savings banks finance group). Hence, if a company uses a particular framework, it must be named. Otherwise, reporting entities must state why no framework has been used.

Affected companies in Germany are not required to verify their NFR by an independent external auditor. Provided that the company chooses a voluntary audit, the audit results must be publicly available. Furthermore, CSR-DIA distinguishes between a "reasonable level of assurance" and a "limited level of assurance."

In conclusion, the CSR-DIA bolstering NFR in Germany provides comprehensive reporting legislation for the first time with minimum content requirements. However, it simultaneously offers considerable margins of discretion and flexibility in reporting.

3. Literature review, framework, and hypotheses

3.1. Literature review on non-financial reporting quality

Corporate reports are the most frequently studied means of communication in NFR literature. According to focus, studies analyzing NFRQ can be divided into two groups: those relying on quantity and those relying on quality (Beretta & Bozzolan, 2008). Researchers assessing NFRQ based on the volume (quantity) of information (e.g., the number of pages, phrases, sentences, themes, or words) do not consider the comprehensiveness and quality of the written text. Accordingly, lengthy and detailed reporting containing irrelevant and ambiguous words may indicate the extent, but not the quality, of reporting (Kuzey & Uyar, 2017). While the scope and number of topics in NFR may be essential to reporting users and practitioners, using the extent of reporting to measure reporting quality may be inappropriate. Hence, previous research suggests that reporting quality is more meaningful than reporting quantity (Hasseldine et al., 2005).

Although high-quality NFR provides several benefits such as improved transparency that facilitates for overcoming stakeholder skepticism and gaining their trust (Dando & Swift, 2003; Lock & Seele, 2016), numerous studies have criticized the quality of such reports owing to their lack of relevance and credibility (e.g., Coombs & Holladay, 2013; Dando & Swift, 2003; Husillos et al., 2011). Despite these concerns about the NFRQ, no robust and universally applicable method for assessing report quality has been established (Hahn & Kühnen, 2013). Some authors have developed quality assessment schemes based on reporting standards such as the GRI framework, while others have assessed the NFRQ by designing reporting quality indices (e.g., Daub, 2007; Dumitru et al., 2017; Habek & Wolniak, 2016; Hoffmann et al., 2018; Lock & Seele, 2016; Michelon et al., 2015; Mion & Loza Adaui, 2019). In the latter, the quality of each individual indexed criteria usually results from the different levels or weighting of the scores assigned to them. Those reporting quality indices refer to a calculation of scores that can serve as an indication of the level of information quality when aggregated. Therefore, they allow for an in-depth investigation of reporting quality in NFR. Table 1 provides an overview of studies in which the authors self-measured NFRQ using a framework.

The broad scope, high complexity, multidimensionality, and different understandings of the CSR concept imply that scholars use a variety of categories, criteria, and score ratings to assess NFR information quality. These dissimilarities, along with other aspects such as the unit of analysis or sample size, may have led to the literature on NFRQ providing mixed results. Furthermore, only a handful of studies examine the influence of determinants on reporting quality (Dienes et al., 2016). Considering the these factors and that NFRQ remains under-researched (Hahn & Kühnen, 2013), this study advances the literature by measuring reporting quality in mandatory NFR and examining its determinants.

3.2. Theoretical framework

As legitimacy theory posits an implicit social contract between organizations and society (Lantos, 2001), it is commonly used to analyze NFR and explain different determinants. Such a social contract represents society's tacit expectations of corporations and their societal responsibilities, thus providing them with a "license to operate" (Deegan, 2002). Therefore, organizations can obtain legitimacy, but only if their corporate values, missions, and activities homogenize with accepted norms, values, beliefs, and definitions of the wider society (Suchman, 1995).

Suchman (1995) asserts that the legitimacy concept proceeds at two levels: managerial and institutional. From a managerial perspective, legitimacy is viewed as a resource that companies can control and influence through appropriate strategic behaviors (Dowling & Pfeffer, 1975; Lindblom, 1994; Woodward et al., 1996). In contrast, institutional legitimacy refers to constraints that force companies to behave in a more or less consciously isomorphic manner to conform to social norms and values (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Therefore, institutional legitimacy is unlike the resource that organizations must acquire.

Table 1. Overview of studies on NFRQ

Year	Author(s)	Analyzed ports	Number of categories/criteria	Assessment scale	Findings
2007	Daub	Annual reports and other reports published periodically (sustainability, environmental, social) of 76 Swiss companies	4/33	Each criterion is assessed on a scale between 0 and 3 points	Overall, companies scored an average of one-third of points available, representing a low reporting quality and leaving room for improvement.
2015	Michelon et al.	Sustainability reports (or sustainability sections) of 112 companies that were listed on the London Stock Exchange	3/39	Using different formulas (ranging between 0 and 1) to assess criterion	Sustainability reports tend to be more symbolic and less substantive. Several determinants, such as reporting frameworks, stand-alone reports, and assurance, are not related to higher reporting quality.
2016	Habek and Wolniak	507 sustainability reports of companies from various European countries (e.g., Denmark, France, Poland)	2/17	Each criterion is assessed on a scale between 0 and 4 points	Reporting quality is generally low in all countries, leaving room for improvement. Considering the specific quality categories, the relevance of information was higher than the credibility of information. Moreover, legal reporting requirements have a positive effect on reporting quality.
2016	Lock and Seele	237 sustainability reports of European companies (e.g., from Austria, Belgium, France, Germany) that are listed on stock market indices	4/96	Various assessment scales: open, nominal, and ordinal codes, ranging between 0 and 3 points plus 0 and 10 points	The assessed reporting quality was below average in terms of credibility. Hence, reports must be understandable before addressing truth, sincerity, and appropriateness.
2017	Dumitru et al.	Annual reports/ integrated reports of 20 companies from Romania and Poland	4/20	Each criterion is assessed on a scale between 0 and 3 points	Reporting quality in Romania is higher than in Poland. Prior regulation to the Directive, institutional characteristics, ownership, industry, and auditors affect reporting quality.

(*Continued*)

Table1. (*Continued*)

Year	Author(s)	Analyzed ports	Number of categories/criteria	Assessment scale	Findings
2018	Hoffmann et al.	522 non-financial reports or, in their absence, the management report of companies from Germany	2/48 (26) for large (small) companies	Each criterion is assessed on a scale between 0 and 5 points	Many reports still have room for improvements to meet the reporting requirements of the Directive. Moreover, reporting quality appears to be greater in stand-alone reports than in management reports.
2019	Mion and Loza Adaui	132 sustainability reports from German and Italian companies	3/20	Presence/absence of a criterion	Reporting quality increased after the implementation of the Directive. Furthermore, the Directive appears to minimize differences in reporting quality between countries.

The Directive, Directive 2014/95/EU.

Although banking products and services have a negligible direct detrimental impact on the environment compared to other industries (Branco & Rodrigues, 2006), considering that their operations are deemed “safe” for society (Khan, 2010), banks benefit from seeking organizational legitimacy by demonstrating their social worthiness (Oliver, 1991). During the global financial crisis of 2008, corporate actions faced great scrutiny. The management of banks at the time was found to have engaged in socially irresponsible practices (Herzig & Moon, 2013), leading to adverse social impacts and ultimately causing a crisis of legitimacy for the banking sector. Therefore, this study is grounded in the managerial approach, as it can be used as a communication tool to gain and manage legitimacy and protect and enhance image and reputation (Hooghiemstra, 2000).

3.3. Hypotheses development

As this study examined banks’ NFR over several years, the author expects reporting quality to positively develop to create a better social image for banks (Belkaoui & Karpik, 1989). Banking institutions, especially those reporting on non-financial matters for the first time, are becoming more aware of their versatile impacts over time by reporting on them, thus increasing their overall NFRQ. Based on these premises, and as per other studies that have found an enhanced reporting quality of NFI in a compulsory reporting setting (Bubna-Litic, 2008; Chauvey et al., 2015), the following directional hypothesis is formulated:

H1. The level of banks’ NFRQ increases significantly and positively over time.

Before the Directive’s transposition into national law, a limited number of banks in Germany voluntarily published NFI. Research has shown that NFR has become more technical (Albertini, 2014). Therefore, Lock and Seele (2016) suggest that the more experience a company has gained in preparing and publishing non-financial reports, the more extensive the reporting expertise. Comparatively, more-experienced companies also generate a higher reporting quality in voluntary NFR (Ruhnke & Gabriel, 2013). Naturally, this assumption can be upheld for mandatory NFR as companies with previous reporting experience may adapt more easily to the current legal requirements (Zarzycka & Krasodomska, 2021). Meanwhile, the CSR-DIA urges less-experienced

Table 2. NFRQ assessment scale

Points	Description
0	The NFR does not contain factual information related to the criteria.
1	The NFR contains limited information on a few aspects related to the criteria.
2	The NFR contains detailed information on a few aspects related to the criteria.
3	The NFR contains detailed information on multiple aspects related to the criteria.
4	The NFR contains very detailed/best practice information on most aspects related to the criteria.

Note(s): NFR, non-financial reporting.

companies to make significant organizational changes to collect and report required information (Cormier et al., 2005); hence, it is hypothesized that:

H2: Previous reporting experience has a significant positive impact on banks' NFRQ.

Research has provided mixed results on the relationship between the reporting format and NFRQ (Balluchi et al., 2021; Chauvey et al., 2015; Lock & Seele, 2016; Michelon et al., 2015). Some scholars believe that stand-alone reports signal explicit corporate engagement and unconditional corporate commitment to environmental and social responsibility (Gray & Herremans, 2012; Mahoney et al., 2013). Similarly, Dhaliwal et al. (2011) highlighted that the issuance of stand-alone reports facilitates the dissemination of material and relevant information in detail. Consistent with the CSR-DIA, NFI published as a combined report requires high-quality data and assurance standards, resulting in less information quality than for stand-alone reports (Hoffmann et al., 2018). This may negatively impact reporting quality. Therefore, as per the presented argument, it is hypothesized that:

H3: The reporting format has a significant impact on banks' NFRQ.

Researchers have also addressed the relationship between standardized reporting frameworks and NFRQ (e.g., Lock & Seele, 2016; Michelon et al., 2015; Zarzycka & Krasodomska, 2021). Using standardized reporting frameworks provides adequate information, covers company- and industry-relevant content aspects, and ensures a degree of certainty about data accuracy (Sethi et al., 2017). Akisik and Gal (2011) found that sustainability reporting and reporting standards likely contribute to organizations' sustainable development. While the GRI guidelines remain the dominant global reporting framework in NFR (KPMG, 2020), many medium-sized and small companies in Germany use the GSC. Regardless of whether an international, national, or industry-specific guideline is used, reporting based on standardized reporting frameworks is more likely to comply with the CSR-DIA (Hoffmann et al., 2018). Therefore, the author presents the following hypothesis:

H4: Standardized reporting frameworks have a significant positive impact on banks' NFRQ.

Another prominent topic in NFR literature is the impact of external audits on NFRQ. Generally, a rigorous audit process ensures information quality and monitors reporting exercises (Jensen & Meckling, 1976). Therefore, some scholars believe that independent audits will increase completeness, meaningfulness, and relevance of specific information, and close the credibility gap in NFR

(Dando & Swift, 2003; Michelon et al., 2015). Hence, sizeable international audit organizations, particularly the Big Four audit firms, provide more reliable and diligent reporting assurances because of their more significant resources, industry specialization, and higher litigation risk (Becker et al., 1998; Brown et al., 2010). Contrastingly, Owen et al. (2000) questioned the usefulness of audit procedures based on non-financial performance indicators and viewed them as a controlled public relation measure. Similarly, auditing NFI can be perceived as a symbolic effort, especially for companies with limited environmental and social reputations (Michelon et al., 2015). Nonetheless, the CSR-DIA bill states that external auditing of NFR could increase confidence in reported information (Bundestag, 2016). Considering this and the empirical results in a German context, which showed a positive impact of external audits on NFRQ (Velte & Stawinoga, 2016), it is hypothesized that:

H5: The external audit has a significant positive impact on banks' NFRQ.

4. Research design

4.1. Non-financial reporting quality (NFRQ) assessment tool

Constructing an NFRQ assessment tool comprises several stages. Similar to Habek and Wolniak's (2016) study, the reporting quality for this study consists of the relevance and credibility of information. Relevance refers to the content requirements of the CSR-DIA. As per the CSR conceptualization by the EC, it also includes criteria that highlight collaborations between organizations and stakeholders. Eventually, reporting activities have witnessed a recent shift from an "inform me" to an "engage me" approach (Kaur & Lodhia, 2018). Owing to such stakeholder engagement activities, accompanied by public and political pressure and a corporate mindset of self-critical reflection, responsible corporate actions should be implemented and described as such in the NFR (Hess, 2008). Credibility relates to the reliability and trustworthiness of the NFI presented in the report (Chauvey et al., 2015; Lock & Seele, 2016).

The author has carefully selected the criteria for each category to ensure meaningfulness and eliminate ambiguity. First, the CSR-DIA was reviewed to ensure that the minimum content requirements were included in the assessment framework. Second, the literature on NFR was used to identify the criteria. Third, two standardized reporting frameworks, the GRI and GSC, were extensively reviewed to determine additional criteria. Subsequently, the author and a second coder (an experienced research assistant) validated the checklist by conducting a pilot survey using 10 non-financial reports from banks not included in the sample. Therefore, criteria that were most relevant to the banking sector were selected, defined, categorized, and included in the NFRQ assessment framework. Contrastingly, others were omitted; the final framework for assessing banks' NFRQ comprised 31 criteria (Appendix 1).

Content analysis is the preferred method in NFR research. By codifying written text (or content) into different categories and groups based on selected criteria, the content analysis provides empirical, valid, and replicable results (Abott & Monsen, 1979; Krippendorf, 2019). A five-point Likert scale (0–4) was used to assess the banks' NFRQ (see Table 2).

Then, the NFRQ for each bank was calculated as the ratio of points awarded over the maximum score that a bank could achieve as follows:

$$NFRQ = \frac{\sum(Relevance, Credibility)}{124}$$

Validity, internal consistency, and reliability are paramount; hence, these concerns were carefully addressed. First, validity was ensured by using multiple sources to construct the NFRQ assessment tool (Milne & Adler, 1999). Second, the Cronbach's coefficient value of 0.85 indicated a sufficient internal consistency of measurement (Tavakol & Dennick, 2011). Third, 15% of the

Table 3. Definition of study variables

Acronym	Variable	Definition
NFRQ	Non-financial reporting quality	The ratio of points awarded for NFR, over maximum points achievable.
EXP	Reporting experience	Dummy variable of 1 if the bank had gained experience in voluntary non-financial reporting; 0 otherwise.
FOR	Reporting format	Dummy variable of 1 if the bank released a stand-alone report; 0 otherwise.
FRA	Reporting framework	Dummy variable of 1 if the bank used a standardized reporting framework for NFR; 0 otherwise.
AUD	Reporting audit	Dummy variable of 1 if the NFR was audited by one of the Big Four audit firms; 0 otherwise.
SIZ	Bank size	Natural logarithm of total assets.
PRO	Bank profitability	The ratio of operating profits to operating turnover.

Note(s): NFR, non-financial reporting

Table 4. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
NFRQ	1.83	0.44	0.52	3.45
EXP	0.22	0.41	0	1
FOR	0.92	0.27	0	1
FRA	0.92	0.27	0	1
AUD	0.07	0.26	0	1
SIZ	34,060.49	127,597.35	2,412.02	1,372,646.00
PRO	0.21	0.11	−0.16	0.50

Note(s): NFRQ, non-financial reporting quality; EXP, previous experience in non-financial reporting; FOR, reporting format; FRA, reporting framework; AUD, reporting audit; SIZ, bank size as the amount of total assets in million EUR; PRO, bank profitability in percent. South Texas Art Therapy Association (STATA) 16 was used for statistical analysis.

sampled NFR was independently coded to test for inter-coder reliability, resulting in a value for Krippendorf's alpha value of 0.86, which corresponds to a good reliability level (Krippendorf, 2019). Therefore, this study considered the constructed NFRQ assessment framework and its application as valid, consistent, and reliable.

4.2. Sample selection

As this study focuses on German banking, the sample only includes banks operating in Germany. To ensure homogenous data, only "universal banks" were considered in this study. Based on the average total assets between 2017 and 2019, the sample comprised Germany's 100 largest banks, provided that they had published NFI for each year. Thus, the final sample included 300 bank-year observations. Banks' NFIs were then extracted from combined or stand-alone reports.

4.3. Data analysis methods

As the NFRQ had a non-normality distribution, the non-parametric Wilcoxon singed-rank test was appropriate to determine whether the banks' NFRQ differed significantly across years *(H1)*. Panel

Table 5. NFRQ assessment

No.	Criterion	2017	2018	2019	TOTAL
Relevance of information					
R1	Business model	2.10	2.11	2.11	2.11
R2	Products and services	2.02	2.23	2.52	2.26
R3	Proprietary business	0.91	1.29	1.63	1.28
R4	Financial inclusion	1.08	1.10	1.19	1.12
R5	Resources	2.34	2.46	2.58	2.46
R6	Emissions	1.56	1.73	1.86	1.72
R7	Biodiversity	0.66	0.72	0.80	0.73
R8	Health and safety	2.58	2.75	2.79	2.71
R9	Equality	2.23	2.33	2.43	2.33
R10	Assistance and benefits	2.31	2.37	2.44	2.37
R11	Qualifications	2.49	2.65	2.76	2.63
R12	Community activities	2.45	2.56	2.68	2.56
R13	Employee volunteering	0.86	0.86	0.87	0.86
R14	Human rights	1.36	1.63	1.83	1.61
R15	Anti-corruption and bribery	2.52	2.82	2.91	2.75
R16	Supply management	1.10	1.34	1.55	1.33
R17	Stakeholder mapping	3.43	3.50	3.56	3.50
R18	One-way engagement	2.07	2.09	2.12	2.09
R19	Two-way engagement	2.27	2.39	2.43	2.36
R20	Stakeholder participation	0.92	1.03	1.01	0.99
R21	Contact details	3.02	3.15	3.15	3.11
R22	Goals and targets	1.51	1.71	1.81	1.68
R23	Long-term strategic anchorage	2.05	2.09	2.25	2.13
R24	Self-critical reflection	0.16	0.25	0.41	0.27

(*Continued*)

Table5. (*Continued*)

No.	Criterion	2017	2018	2019	TOTAL
R25	Learning progress	0.58	0.61	0.73	0.64
Relevance of information total		*1.78*	*1.91*	*2.02*	*1.90*
Credibility of information					
C1	Accuracy	1.99	2.27	2.41	2.22
C2	Balance	0.09	0.09	0.12	0.10
C3	Clarity	2.23	2.49	2.58	2.43
C4	Comparability	1.64	2.00	2.20	1.95
C5	Timeliness	2.18	2.22	2.26	2.22
C6	Rating or indexing	0.23	0.26	0.35	0.28
Credibility of information total		*1.39*	*1.56*	*1.65*	*1.53*
NFRQ TOTAL		***1.71***	***1.84***	***1.95***	***1.83***

Note(s): Table 5 summarizes the level of reporting quality per criterion, category, and total NFRQ for each year, as well as average scores.

Table 6. Wilcoxon signed-rank test

		N	Mean rank	Sum of ranks	Z
Level of NFRQ					
2018–2017	Positive ranks	87	55.24	4,806.00	
	Negative ranks	6	36.00	216.00	
	Ties	7	4.00	28.00	
	Total	100		5,050.00	7.897***
Level of NFRQ					
2019–2018	Positive ranks	78	60.02	4,681.50	
	Negative ranks	6	38.75	232.50	
	Ties	16	8.50	136.00	
	Total	100		5,050.00	7.675***

Note(s): NFRQ, non-financial reporting quality. *; **; *** Asymptotic significance at the 0.1, 0.05 and 0.01 levels. STATA 16 was used for statistical analysis.

data regression was used to test hypotheses *H2* to *H5*, as it is a suitable method for eliminating problems related to multicollinearity and estimation bias.

To avoid model misspecification, the author included two control variables that might impact the NFRQ regression model. First, larger firms have a more significant impact on society and greater visibility than smaller firms. Therefore, they are more exposed to the influence of a broader range of stakeholders (customers, employees, investors, media, etc.), rigorous regulatory requirements, and public scrutiny to legitimize their business operations through NFR (Branco & Rodrigues, 2006; Reverte, 2009). Hence, bank size is likely to influence NFRQ. Second, whether firms' profitability impacts environmental and social reporting remains uncertain (e.g., Orlitzky et al., 2003). Based on the legitimacy theory, profitable companies may report more high-quality information to legitimize their operations. In contrast, less-profitable organizations report sophisticated details to demonstrate that their operations add social value (Neu et al., 1998). Thus, no sign of expectation is formed in predicting the significant influence of bank profitability on NFRQ.

Both control variables were lagged by one year as firm factors in *t-1* should drive strategic planning on social responsibility-type activities in *t*. Hence, they are most likely to affect NFRQ in *t*. Therefore, the econometric model is estimated as follows:

$$NFRQ_{it} = \alpha_0 + \beta_1 EXP_{it} + \beta_2 FOR_{it} + \beta_3 FRA_{it} + \beta_4 AUD_{it} + \beta_5 SIZ_{it-1} + \beta_6 PRO_{it-1} + \eta_{it} + \varepsilon_{it}$$

$$i = 1, 2, \ldots\ldots\ldots\ldots.., 100; t = -1, 1, 2 and 3$$

where *NFRQ* denotes the level of reporting quality, *EXP* is the reporting experience, *FOR* is the reporting format, *FRA* is the reporting framework, *AUD* is the reporting audit, *SIZ* is the bank size, *PRO* is the bank profitability, η is the unobserved heterogeneity for individual bank effects, ε is the specific error term, and *i* and *t* are bank and time indices, respectively. Table 3 summarizes the detailed definitions and measurements of all regression variables.

Regression diagnostic tests determined the presence of heteroscedasticity (likelihood ratio test), first-order correlation (Wooldridge, 2010), and cross-sectional dependency (a proposed test by Pesaran, 2004) in the dataset. Therefore, this study adopted a panel corrected standard error (PCSE) estimation. PCSE estimation provides efficient and consistent results for finite samples when the number of firm dimensions is greater than the number of time dimensions.

Table 7. Spearman correlation matrix and variance inflation factor

	1	2	3	4	5	6	7
1. NFRQ	1						
2. EXP	0.2593***	1					
3. FOR	0.2106***	−0.0214	1				
4. FRA	0.3228***	−0.1103*	0.3659***	1			
5. AUD	0.0661	0.4988***	−0.1998***	−0.3884***	1		
6. SIZ	0.2791***	0.3981***	−0.030	−0.1461**	0.4388***	1	
7. PRO	0.0027	−0.1760***	0.1521***	0.3374***	−0.3894***	−0.3866***	1
8. VIF	-	1.43	1.17	1.40	2.60	2.82	1.60

Note(s): NFRQ, non-financial reporting quality; EXP, reporting experience; FOR, reporting format; FRA, reporting framework; AUD, reporting audit; SIZ, bank size as amount; PRO, bank profitability; VIF, variance inflation factor. *; **; *** Asymptotic significance at the 0.1, 0.05 and 0.01 levels. STATA 16 was used for statistical analysis.

5. Results

5.1. Descriptive statistics

The reporting quality in banks' mandatory NFR varied greatly, as indicated by the minimum (0.52) and maximum (3.45) values (Table 4). Banks achieved an overall reporting quality of 1.83 on average, and 22 banks reported voluntary NFI before implementing the CSR-DIA. Most banks chose the stand-alone reporting format during the review period to publish NFI (92%). Many banks used a standardized reporting framework to prepare their NFR (92%). Overall, only a few banks verified their NFR by external auditors (7%). Additionally, the sample included some large banks (1,372 billion EUR in total assets) and some much smaller banks (2.4 billion EUR in total assets). Banks' profitability had a mean value of 21% and varied between—16% and 50%.

5.2. Non-financial reporting quality (NFRQ) assessment and hypotheses verification

The overall reporting quality of the 300 mandatory non-financial reports from banks was 1.83, with the category of information relevance being significantly higher than the credibility of information for each year (see Table 5). Considering the relevance of information, the criterion relating to mapping stakeholders (R17) achieved the highest score (3.50). This was followed by indicators concerning contacting the person or department responsible for NFR creation (R21, 3.11) and anti-corruption and bribery (R15, 2.75). Contrastingly, the R24 criterion (self-critical reflection) scored the lowest (0.27). The clarity of information (C3) in the credibility category was the highest-rated (2.43). Furthermore, most NFI was presented in a reasonably accurate, comparable, and timely manner. However, banks' NFR lacked balanced information (C2, 0.10) and the C6 criterion concerning external ratings or indexing (0.28).

The Wilcoxon signed-rank test was used to examine whether the slight increase in banks' reporting quality between years was significant (see Table 6). The results indicated a statistically significant increase in NFRQ. Hence, this study supports *H1*.

Before running the PCSE regression, Spearman correlation analysis was conducted to determine the bivariate relationships between variables. A positive correlation was found at the 1% significance level between NFRQ and experience, format, framework, and size (Table 7). Therefore, the findings provide preliminary support for hypotheses *H2* through *H4* [2].

This study identified relationships between the NFRQ and reporting-level determinants in the PCSE regression results. As can be seen in Table 8, the estimated coefficient for *EXP* indicates that prior non-financial reporting experience had a positive impact on banks' reporting quality at the 1% significance level (β = 0.1615; p < 0.01). Hence, *H2* is supported. The estimated coefficient *FOR*

Table 8. PCSE regression results	
Dependent variable	**NFRQ**
Independent variables	
EXP	0.1615*** (0.0611)
FOR	0.2266*** (0.0621)
FRA	0.7889*** (0.0774)
AUD	−0.0019 (0.2050)
SIZ	0.1733*** (0.0457)
PRO	−0.0276 (0.2094)
CONSTANT	−3.1279*** (1.0557)
N	300
Wald Chi (2)	186.71***
R^2	38.88
Likelihood ratio test	287.01***
Wooldridge test	40.632***
Cross-sectional dependency	70.338***

Note(s): NFRQ, non-financial reporting quality; EXP, reporting experience; FOR, reporting format; FRA, reporting framework; AUD, reporting audit; SIZ, bank size; PRO, bank profitability. Standard errors in parentheses (corrected for heteroscedasticity, autocorrelation, and contemporaneous correlation). *; **; *** Asymptotic significance at the 0.1, 0.05 and 0.01 levels. STATA 16 was used for statistical analysis.

implies that using stand-alone reports was highly significant and positively correlated to banks' NFRQ (β = 0.2266; $p < 0.01$). Therefore, *H3* is supported. Similarly, the estimated coefficient for *FRA* shows that using standardized reporting frameworks had a positive impact on banks' NFRQ (β = 0.7889; $p < 0.01$). Furthermore, the estimated coefficient of AUD shows a positive but insignificant relationship between audited NFR and reporting quality. Therefore, *H5* is rejected. Regarding the control variables, the estimated coefficient for *SIZ* indicates that bank size was positively correlated with NFRQ (β = 0.1733; $p < 0.01$). Contrastingly, reporting quality was insignificantly affected by bank profitability, as indicated by the estimated coefficient of *PRO*.

6. General discussion and implications

6.1. Discussion of non-financial reporting quality (NFRQ) assessment

Consistent with other studies (e.g., Daub, 2007; Habek & Wolniak, 2016; Lock & Seele, 2016; Michelon et al., 2015), the reporting quality in banks' mandatory NFR is generally low, with NFRQ scoring less than half of the possible score each year. Therefore, it represents a mediocre, rather than sophisticated, maturity level of reporting. There are several reasons for this. Some banks with passive or indifferent responsibility-related strategies and policies may focus on reducing their data gathering and reporting costs to meet regulatory requirements (Schaltegger, 1997). Others comply with the legal requirements solely to meet and report on these minimum standards and limit opportunities to distinguish themselves as a company (Habek & Wolniak, 2016). Therefore, this study indicates the number of banks reporting on NFI may have increased, but the reporting quality not necessarily has.

Similar to Habek and Wolniak (2016), the annual quality scores for the relevance of information were higher than the scores for credibility of information. Regarding the relevance category, banks seemed to provide an ambitious picture of engaging with their stakeholders, as indicated by the highest criteria scores of mapping stakeholders (R15) and providing contact details (R17). However, the reporters in this study did not recognize the benefits of stakeholder engagement, as the lowest-rated criterion was R25 (learning progress). This finding may indicate that banks simply view their stakeholder engagement activities as stakeholder management or public relations strategies (Hess, 2008; Owen et al., 2000) [3]. Banks also reported relatively detailed information on combating bribery and corruption (R15). This finding was anticipated, as banks must meet strict legal requirements to operate in an approved and legitimate manner (Oliver, 1991). Additionally, NFR achieved a reasonable granularity of reporting quality for criteria referring to labor practices (R8—R11). This may be because banks are in constant competition for employees, and these responsibility-related activities can positively impact employee retention and satisfaction. Another reason could be the historically high and unionized employee involvement that companies in Germany have to contend with (Adams et al., 1998).

On the credibility of information, the highest reporting quality was achieved for clarity (C3, 2.43), whereas balanced information (C2) and external ratings or indexing (C6) were assigned the lowest reporting quality. Banks self-laudably focus on their achievements, positive contributions to the environment and society, and the *"good news"* while neglecting the negative impacts. Relatedly, balanced reporting is associated with organizational failures, setbacks, unmet goals, and, in the case of capital market-oriented banks, income risk (Einwiller & Carroll, 2020; Mishra & Modi, 2013). Meanwhile, reporting without an excessively positive and embellished tone can promote and reinforce the credibility of the written text (Carroll & Olegario, 2020). References to external ratings or indexing can also be an essential factor affecting the credibility of the NFR but is not widespread among banks as confirmed by this study's findings.

6.2. Discussion of hypotheses verification

By confirming *H1*, this study augments previous findings that reporting quality in a compulsory reporting environment improves incrementally, steadily, and significantly over time (Bubna-Litic, 2008; Chauvey et al., 2015). Presumably, this improvement can be attributed to banks' growing experience in NFR. This refers to the assumption that banks have greater awareness and understanding of non-financial topics and better processes for collecting, measuring, and analyzing critical data. Therefore, the progressive results on NFRQ can be interpreted as a substantial improvement in reporting quality.

Unlike previous studies (Lock & Seele, 2016; Zarzycka & Krasodomska, 2021), this study supports *H2*, which states that a bank's prior NFR experience is positively correlated with NFRQ. That is, considering organizational structures and the collection and presentation of relevant data, banks with voluntary reporting experience have a knowledge advantage that positively and significantly impacts NFRQ.

Moreover, this research supports the hypothesis that using stand-alone reports ensures better reporting quality *(H3)* and thus conforms to previous findings (Dhaliwal et al., 2011; Lock & Seele, 2017; Michelon et al., 2015). Therefore, it can be argued that stand-alone non-financial reports guarantee more space and are thus more suitable for high-quality reporting than combined (integrated) reports (Hoffmann et al., 2018).

As observed, adopting standardized reporting frameworks has a significant positive impact on banks' NFRQ *(H4)*. This confirms the findings of other studies (Lock & Seele, 2016; Zarzycka & Krasodomska, 2021). Thus, standardized reporting frameworks represent legitimate tools for identifying gaps in NFR, thereby improving NFRQ systematically.

Interestingly, contrary to expectations, banks' NFRQ is not significantly correlated with external audits *(H5)*. All banks in the sample chose to have their NFR externally certified and commissioned and received "limited assurance." From this, and as per previous research (Michelon et al., 2015), banks in Germany may use NFR audits as a symbolic and cosmetic routine to influence stakeholder confidence in reporting rather than certify and legitimize their NFRQ.

In the European mandatory reporting environment, bank size explains NFRQ significance, consistent with the results ofprevious studies (Branco & Rodrigues, 2006; Reverte, 2009). However, bank profitability does not seem to explain NFRQ. This result may be due to the different variables that intervene in the linear relationship between profitability and NFRQ (Waddock & Graves, 1997) or to the fact that banks' NFRQ is less driven by economic (economic pressure) than social legitimacy (public and regulatory pressure; Patten, 1991).

6.3. Theoretical, practical, and policy implications

For researchers investigating NFR, this study assessed NFRQ over several years and responded to the call for more longitudinal research (Khan et al., 2020). While a unified NFRQ assessment framework remains absent (Hahn & Kühnen, 2013; Skouloudis et al., 2009), this study used a robust and novel two-dimensional instrument, following Habek and Wolniak (2016), to assess banks' reporting quality in mandatory NFR. Understanding how reporting quality evolves in a required reporting environment not only confirms the findings from previous studies with a similar research design (Bubna-Litic, 2008; Chauvey et al., 2015), but also verifies their generalizability. Hence, the sample of this study is unique because it included only a few large and listed banks, and a reasonably sizable number of medium-sized and small banks without any capital market orientation. Finally, this study contributes to the growing body of research on the Directive by providing initial findings on NFRQ and the influence of reporting-level determinants.

For most banking professionals, mandatory NFR represents a relatively new accounting genre. NFR should be considered a communication tool to map and promote stakeholder engagement that adds value to stakeholders and banks and contributes to sustainable development instead of traditional accounting and formal box-ticking. Therefore, bank professionals need training and knowledge to provide meaningful reporting and cultivate an attitude toward informational transparency and social accountability, which sees NFR as a cross-sectional task within banking.

For policymakers, the empirical findings of this study are assessed based on the most recent proposal of the Corporate Sustainability Reporting Directive (CSRD). According to the CSRD, introducing a Europe-wide reporting standard is ideal. Simultaneously, integrating NFR into the annual report and implementing a binding audit (with "limited assurance intensity") is most unlikely to positively impact overall reporting quality. Additionally, the CSRD specifies different content areas that need to be examined in more detail. However, policymakers should consider the quantity of NFI and address the quality of this information to present substantive content to the reader.

7. Conclusion

This study measured the reporting quality of banks' mandatory NFR using a unique assessment instrument. The objective was based on the difficulty of measuring NFRQ and the limited knowledge available on compulsory NFR in the EU. Various determinants were examined for their significant impact on NFRQ. This study showed that while banks' annual NFRQ (2017–2019) remained mediocre, slight but significant annual improvements were noted. Moreover, several reporting-level determinants (experience, format, and framework) substantially affected NFRQ. Additionally, this study highlighted implications for researchers, banking professionals, and policymakers.

However, the findings of this study must be interpreted considering the following limitations, which will in turn, enhance and facilitate future research. First, the sample was limited to banks from Germany. Hence, the findings may not be generalizable to other countries or sectors. Therefore, future research could consider applying this study to the banking industries in other EU member states or other sectors (e.g., insurance). Second, the author acknowledges that the assessment framework may not fully capture all possible and relevant dimensions of NFI. Therefore, future studies could improve, deepen, and implement the framework to understand the NFRQ. Third, future research may test other determinants that substantially influence reporting quality in mandatory NFR.

Notes

[1] This study uses "non-financial reporting" (NFR) based on the European Directive. However, the author acknowledges the diverse terms used interchangeably with NFR in the corporate world. These include corporate social responsibility, corporate responsibility, sustainability, and social and environmental reports. Nonetheless, these reports are defined differently (see, e.g., Stolowy & Paugam, 2018).
[2] Furthermore, Table 7 provides evidence that the issue of multicollinearity is not present in this study, as variance inflation factor (VIF) tests show that each VIF value is below the threshold of 10 (Chatterjee & Hadi, 2013). These correlation coefficients are below the threshold coefficient value of 0.8 (Field, 2018).
[3] However, if stakeholders do not engage with banking institutions, reporting cannot be made.

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Data availability statement

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Appendix 1

NFRQ assessment structure

No.	Criterion	*Description*
Relevance of information		
R1	Business model	*The NFR presents the business model and critical information (target customers, banking activities, number of branches, etc.)*
R2	Products and services	*The NFR presents information on sustainable banking products and services (criteria and volume for financing, lending)*
R3	Proprietary business	*The NFR contains indications on sustainable bank proprietary business (exclusion criteria, etc.)*
R4	Financial inclusion	*The NFR describes products and services for disadvantaged people (accessibility, basic account for everyone, etc.)*
R5	Resources	*The NFR describes resource consumption and indicates measures to reduce resource usage (use of LED lighting, etc.)*
R6	Emissions	*The NFR contains information on emissions and measures to reduce them (using renewable energies, electric vehicles, etc.)*
R7	Biodiversity	*The NFR presents activities on beautification and preservation (greening, tree planting campaigns, etc.)*
R8	Health and safety	*The NFR provides measures to promote occupational health and safety for employees (health management system, robbery prevention, etc.)*
R9	Equality	*The NFR describes measures to promote employee equality (gender and payment equality, promoting diversity, etc.)*
R10	Assistance and benefits	*The NFR contains information on giving assistance and benefits to employees (parental leave, child and elder care, etc.)*
R11	Qualifications	*The NFR presents measures to promote employee qualification (seminars and training, appraisal, etc.)*
R12	Community activities	*The NFR contains information about community activities (donations, sponsoring, collaboration with NGOs, etc.)*
R13	Employee volunteering	*The NFR presents information on employee volunteering (time off for volunteering, financial support, etc.)*

(*Continued*)

(Continued)

No.	Criterion	*Description*
R14	Human rights	*The NFR describes measures to uphold human rights and reduce potential risks (screening of customers, etc.)*
R15	Anti-corruption and bribery	*The NFR presents measures to prevent unlawful conduct and to comply with statutory provisions (data protection policy, whistle-blower system, compliance training for employees)*
R16	Supply management	*The NFR presents indications on managing the bank's supply chain (guidelines for suppliers)*
R17	Stakeholder mapping	*The NFR contains information on mapping relevant stakeholders*
R18	One-way engagement	*The NFR shows how stakeholders are engaged unidirectionally (reporting, press releases, customer events, etc.)*
R19	Two-way engagement	*The NFR indicates how stakeholders can engage with the bank (complaint management, surveys, etc.)*
R20	Stakeholder participation	*The NFR describes options for stakeholder participation (elections, joint product development, advisory board)*
R21	Contact details	*The NFR contains contact information (name of a representative, phone number, email address, contact form)*
R22	Goals and targets	*The NFR presents targets for the future and targets set in previous reporting periods.*
R23	Strategic anchorage	*The NFR contains information confirming that sustainable development/CSR aspects are integrated into the bank's strategy and decision-making (nomination of a CSR manager, etc.)*
R24	Self-critical reflection	*The NFR describes a critical review of banking operations and activities*
R25	Learning progress	*The NFR indicates learning progress through stakeholder engagement (improve accessibility, increase offer of green/sustainable banking products, etc.)*
Credibility of information		
C1	Accuracy	*The NFR contains data collection methods, measurements, underlying assumptions, estimations (explanation of KPIs, use of recognized instruments, etc.)*
C2	Balance	*The NFR presents negative information (headcount reduction, etc.)*

(Continued)

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No.	Criterion	*Description*
C3	Clarity	*The NFR explains technical terms, calculations, abbreviations, and general ease of finding information (meaningful table of content, headlines, link, etc.)*
C4	Comparability	*The NFR names reporting standards, internal guidelines, protocols, benchmarks, presented data from previous reporting periods, etc.*
C5	Timeliness	*The NFR provides exact information on the reporting period; presented data are up to date.*
C6	Rating or indexing	*The NFR contains information on sustainability/CSR rating or indexing (Dow Jones Sustainability Index, Sustainalytics, etc.)*

Note(s): NFR; non-financial reporting. Examples given are intended to provide a concrete understanding of the criteria and are not to be regarded as a complete list