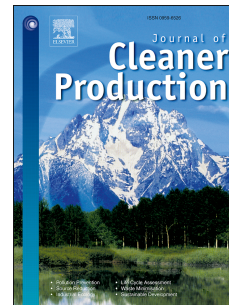


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Board composition and textual attributes of non-financial disclosure in the banking sector: Evidence from the Italian setting after directive 2014/95/EU

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**Board composition and textual attributes of non-financial disclosure in the banking sector:
evidence from the Italian setting after Directive 2014/95/EU**

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Board composition and textual attributes of non-financial disclosure in the banking sector: evidence from the Italian setting after Directive 2014/95/EU

Highlights:

- board composition impacts textual attributes of the non-financial disclosures (NFDs) of banks
- the presence of women on the board of Italian banks mirrors the completeness, readability, and balance of NFDs
- the increase over time of women on the board enhances bank NFD completeness
- smaller boards of directors are associated with higher completeness of bank NFDs

Abstract

More and more, the finance and the financial sector are used as a means of achieving social goals. Thus, the main financial market participants are required to change their ESG identity and to act no longer only as a seller of sustainable products, but also as sustainable actors themselves. For this purpose, banks and financial institutions are required to complement financial information with environmental, social, and governance (ESG) statements to provide a wider overview of the value creation process. Despite the banking sector being of utmost importance in the promotion of a transition towards sustainable economic development, the analysis of the attributes of their non-financial disclosure (NFD) has achieved little attention from scholars thus far. This paper aims at investigating the relationships between board composition and some textual attributes of NFDs by testing the incremental information vs. impression management approach in the Italian banking sector for the years 2017-2020, after the introduction of Directive 2014/95/EU. The final sample is composed of 29 Italian banks. A two-step analysis was conducted. In the first stage, a content analysis was performed to assess the textual attributes of the disclosures, and in the second a multivariate regression model with panel data was run. Empirical findings found a significant impact of board composition and textual attributes on conciseness, completeness, positive tone, and the reading difficulty of NFDs. Results from this study contribute to the literature on disclosure strategies and theories by providing additional knowledge on the role of certain

characteristics of corporate governance in explaining some textual attributes of NFDs in the financial sector. Managerial implications are related to the (re-)design of some governance features which are more suitable in providing a more transparent and comparable NFD. Policy implications are related to the development of policies and regulations at the international level that combine high-quality sustainability-related information and the governance features of financial institutions.

Keywords: sustainable finance; non-financial information; content analysis; EU non-financial reporting directive; EU Directive 95/2014; tone analysis.

1. Introduction

Since companies operate more frequently in knowledge-based economies, they are also required to increase their level of disclosure (Camilleri, 2018). Previous studies have argued that many benefits could be exploited by increasing the level of information disclosed, since managers in the banking sector could more easily manage the environmental impact of their portfolios (Bolton & Kacperczyk, 2021). However, not only the quantity of information disclosed but also its quality could be relevant to stakeholders (Hooks & van Staden, 2011). This has also been clearly underlined by standard setters, which have highlighted that an improved quality of the information available could enable an allocation of capital on the market that is more efficient and productive (e.g., Integrated Reporting, 2021). Indeed, previous studies have argued that narrative aspects of non-financial disclosures (NFD) contain almost twice the amount of information as compared to those available in financial statements. For this reason, the analysis of corporate disclosure no longer focuses only on the quantitative aspects but also on textual attributes of disclosures, such as conciseness, completeness, balance, and readability (García-Sánchez et al., 2019; Li, 2010).

There are two competing schools of thought in the field of corporate narrative disclosure strategies (Brennan et al., 2009; Merkl-Davies & Brennan, 2007; Moreno et al., 2019): first, according to impression management, disclosure choices are opportunistic (Clatworthy & Jones, 2001; Rahman, 2012) since managers are incentivized to manipulate external

perceptions of business results to hide failures and emphasize successes (*obfuscation hypothesis*) (Adelberg, 2012), while high-performing companies signal their superiority by presenting more transparent disclosure (Rutherford, 2003); second, incremental information holds that manager discretion in disclosure is value-relevant and provides investors with additional information for their investment choices (Fisher et al., 2019; Muslu et al., 2019), according to which managers (agents) have an interest in providing information to overcome information asymmetries between external and internal actors in the firm (principals) to improve the cost of capital and performance, and consequently their remuneration (Baginski et al., 2000; Nyberg & Ployhart, 2013).

Moreover, more attention is given to the composition of corporate governance. Numerous studies have tackled the issue of board diversity (Carter et al., 2002; Schippers et al., 2003), which is believed to foster discussion, creativity, innovation, and analytical ability, thereby avoiding the risk of groupthink and producing better monitoring as well as a better understanding of the external environment, and thus of management (Schippers et al., 2003). According to previous studies, corporate governance could influence the quantity and quality of corporate reporting (Abdou et al., 2021; H. Elmagrhi et al., 2022), and the corporate board of directors can have a great impact on the information to be disclosed (Abad & Bravo, 2019; Li, 2008). Thus, although previous research has identified the existence of both internal and external governance mechanisms (Anderloni et al., 2020), this study focuses on the relationship between NFDs and board composition, which is expected to have a greater impact on their textual attributes.

Within this framework, the concept of sustainable finance has evolved in recent years (Camilleri, 2020), as part of the broader concept of business sustainability, considering the idea of sustainable finance as a business opportunity on the one hand (Urban & Wójcik, 2019) and a challenge for banks on the other (Jeucken, 2010). The banking sector has achieved little attention from sustainable finance scholars in terms of non-financial disclosure (Schröder, 2022), and previous studies have found that many banks are not disclosing enough information related to their environmental impact (Bolton & Kacperczyk, 2021). More specifically, Schröder found that the quality of the NFDs of German banks is below average and is driven by experience, format, and framework (Schröder, 2022). Moreover, most

studies focusing on this area are conducted in a voluntary setting, while there are just a few that have analyzed the NFDs of the banking industry in a mandatory setting (Khan et al., 2021; Kumar et al., 2018; Perrault Crawford & Clark Williams, 2010; Schröder, 2022). Khan and colleagues argue that green disclosure positively affects the overall value of Bangladeshi banks; however, other factors contribute to explaining the market value of banks (Khan et al., 2021). By looking at the content of Indian bank disclosures, Kamur and others found that banks are more likely to address social issues rather than more important ones, such as environmental management, the development of green products, and services (Kumar et al., 2018). Furthermore, Perrault Crawford and Clark Williams found evidence that higher NFD quality in both French and US banks is associated with cultural and normative pressures, which can in turn be related to contexts of stronger regulatory requirements (Perrault Crawford & Clark Williams, 2010). In fact, as argued by previous studies, "future research could consider applying this study", i.e., the analysis of reporting quality and its determinants, "to the banking industries in other EU member states or other sectors" (Schröder, 2022). Even after the introduction of Directive 2014/95/EU, studies on non-financial reporting requirements remain limited (Tarquinio et al., 2020) and scattered regarding the topics covered (quality of disclosure) (Carungu et al., 2020) and the results achieved (Mion & Loza Adai, 2019).

Furthermore, to our best knowledge, since only a few studies have analyzed the topic of NFDs after Directive 2014/95/EU in the Italian context (Doni et al., 2019), there is a gap in the literature in analyzing the impact of board composition on disclosure features in this context. Indeed, previous studies have mainly focused on voluntary NFDs (Beretta et al., 2019; Melloni et al., 2016). Moreover, even outside the Italian context, studies on NFDs have focused on the reporting of risk (Fijałkowska & Hadro, 2022), human capital (Beretta et al., 2019), credibility (Balluchi et al., 2021; Mazzotta et al., 2020), or on relationships with financial reporting (Agostini et al., 2022; G. Jackson et al., 2020). However, given the above-mentioned reasons, further investigating this stream of research could provide relevant theoretical and practical implications.

The rising interest in using the content analysis of non-financial reports to evaluate how businesses convey their performance is another indication of this topic's significance (Beretta

et al., 2019). Although outsiders may use the information in these reports to make significant decisions, managers may be able to manipulate the quality of non-financial disclosures, according to earlier studies by adopting impression management theory (Abhayawansa & Guthrie, 2016; Melloni, 2015). Company governance practices may have a particular impact on the caliber of corporate reporting (e.g., M. H. Elmagrhi et al., 2020; Grassa & Moumen, 2021), one of which on the makeup of the board, which is essential for eliminating information gaps between management and shareholders and meeting investor requirements (Samaha et al., 2015). This is especially important in the banking industry, where subpar performance can harm a nation's economic growth. Large-scale bank failures affect macroeconomic stability and have the potential of spreading to other banks, as shown, for example, during the financial crisis of 2007–2008 (Edey, 2009).

Hence, results from this study could contribute to disclosure strategies and theories explaining the adoption of some determinants of NFD features in the financial sector in a mandatory setting. First, by analyzing different disclosure strategies, this study could provide additional evidence to fill in the gap on the relationship between textual attributes of NFDs and board composition, as required by previous studies (Melloni et al., 2017; Caglio et al., 2020). Second, this study could advance some knowledge on disclosure theories by further investigating the prevalent approach – whether impression management or incremental information (Merkl-Davies & Brennan, 2007). Third, it could extend prior literature on the role of textual attributes of NFD in a specific, key, and under investigated sector, i.e. banking (Schröder, 2022; Urban & Wójcik, 2019). Fourth, it could also provide additional knowledge of NFD features in a mandatory context by complementing a previous stream of research, which mainly focused on voluntary disclosure (Doni et al., 2019).

Therefore, our paper aims at investigating the relationships between board composition and some textual attributes of NFDs, answering the following research question: *Are the textual attributes of non-financial reporting in the banking industry affected by board composition?* The remainder of this paper is organized as follows: the following section presents the literature review; in Section 3, the methodology adopted is illustrated; empirical results are outlined in Section 4; finally, the discussion and conclusions sections provide the answer to the research question and present future research paths and implications from this study.

2. Literature review

2.1. Sustainable finance and corporate governance

Studies on non-financial reporting have had a certain impetus following the enactment of Directive 2014/95/EU (Doni et al., 2019; Korca et al., 2021). As a result of the Directive, companies with specific requirements are mandated to prepare and publish a non-financial sustainability disclosure statement covering three main topic areas: environmental, social, and governance. In Italy, Legislative Decree 254 of 30 December 2016 represents the transposition of Directive 2014/95/EU. The requirement to prepare non-financial reporting, coupled with the fact that the financial sector is identified as a crucial sector for the transition to renewable energy, has also boosted studies on sustainable finance. These studies are based on the consideration that investments in the financial sector must consider ESG aspects to develop forms of investment and projects that are also economically sustainable (Schoenmaker & Schramade, 2019). However, only a few studies have been conducted on the analysis of NFDs in the banking industry (Khan et al., 2021).

Worldwide, and in the EU in particular, regulatory requirements related to sustainable finance are abundant. Starting with the United Nations 2030 agenda and the sustainable development goals (SDGs), together with the Paris climate agreement, an international consensus on the new sustainable role of financial markets has begun to spread. Moreover, in 2019 the EU green deal investment plan introduced an emission reduction target of 55% by 2030 as compared to 1990 (European Commission, 2021). In addition, by leveraging on the work of the Technical Expert Group on sustainable finance, as part of the sustainable finance package, a "strategy for financing the transition to a sustainable economy was introduced to achieve several objectives" (European Commission, 2021): first, to extend the EU taxonomy framework and the sustainable finance standards; second, to include SMEs, individuals, and the society at large as relevant stakeholders in the path toward the transition finance; and third, to include a European approach toward a shared-upon set of standards with regard to both the taxonomy and the sustainability-related disclosures. As for sustainability disclosures, the European Commission adopted a set of rules on Sustainable Finance Disclosure Regulation (SFDR), which applies to financial market participants

starting from the 1st of January 2023. SFDR provides preparers with standards on the “exact content, methodology, and presentation of the information to be disclosed, thereby improving its quality and comparability” (European Commission, 2019). The SFDR introduces sustainability disclosure obligations for both manufacturers and advisors of financial products, requiring them to highlight the adverse impacts related to either the financial institution or the financial product. Regulatory technical standards also provide support to financial market participants in the preparation of sustainable finance disclosures. The SFDR could be considered as an important achievement that would change the world of sustainable finance in the future (Busch, 2021)). The Regulation aims at increasing the transparency of NFDs by increasing the accuracy of ESG information (“the objective that disclosures are to be accurate, fair, clear, not misleading, simple and concise” (European Commission, 2019, Article 8) and reduce the risk of greenwashing (de Freitas Netto et al., 2020)). The regulation defines sustainable investments (Art. 2, 17) and imposes common rules for different categories of financial players regarding the disclosure of information on sustainability issues.

A growing stream of literature focuses attention on the analysis of the relationship between NFDs and the features of corporate governance (Molinari & Dimes, 2020). However, few studies, if any, investigate this link within the financial sector (Cosma et al., 2020). More specifically, the study by Cosma and colleagues (2020) highlights that European banks disclose different levels of information based on their country of origin, the legal system, and the adoption of different reporting frameworks, such as, for example, the integrated report. According to previous studies, many disclosure features can be impacted by the characteristics of corporate governance (Aureli et al., 2020), such as the number of directors, the number of independent directors on the board (Fernández-Gago et al., 2018; García-Sánchez et al., 2019), and the board size (Jizi, 2017; Samaha et al., 2015). Hence, the manipulation of the content of the disclosure could be reduced in the presence of strong corporate governance (García Osma & Guillamón-Saorín, 2011). Considering the governance composition, previous studies have found gender balance in the management of the company as supportive to the incremental information approach (Bassyouny et al., 2020), as a more consistent female presence could reduce the tone of optimism. Moreover, a variety

of studies have analyzed the issue of diversity on the board (Al-Qahtani & Elgharbawy, 2020; Harjoto et al., 2015; Hoang et al., 2018; Katmon et al., 2019), which is believed to lead to better monitoring as well as an understanding of the external environment, and thus of the management.

2.2. Text analysis of non-financial reporting in the banking industry

Highlighting the relevance of non-financial information, Smith & Taffler (2000) found that the textual disclosures in annual reports contained almost twice the amount of information as compared to that available in financial statements.

Recent studies have argued that consideration of the quantity of information alone can be a source of erroneous conclusions, arguing instead that a high quality report is one that is focused and concise (Hooks & van Staden, 2011). For this reason, the analysis of corporate disclosure became focused no longer on the quantitative aspects but on the narrative aspect of the text (Li, 2010). A general consensus on the relevance of NFD textual attributes, such as completeness, readability, conciseness, and balance to capture their quality has been addressed by most of the financial and non-financial standard setters (European Commission, 2019; IIRC, 2013; International Sustainability Standards Board, 2022). The textual attributes of NFDs have been found to be correlated with both financial and non-financial corporate performance, (e.g., Beretta et al., 2019; Caglio et al., 2020; Melloni et al., 2017). Melloni and other scholars found that companies with better financial performance are disclosing more complete, concise, readable, and balanced sustainability-related information (Melloni et al., 2017). Caglio and colleagues highlighted that NFD readability fosters higher market valuation, whereas conciseness, higher stock liquidity, and NFD balance – captured by tone bias – lead to less dispersed analysts' estimates (Caglio et al., 2020). By focusing on the tone from the top of companies issuing integrated reports, Beretta and others provided evidence that better non-financial performance is associated with a more positive tone regarding intellectual capital information (Beretta et al., 2019).

After the initial and numerous applications of content analysis to financial reporting (Clatworthy & Jones, 2001; Milne & Adler, 1999), a stream of research has devoted itself to the study of Corporate Social Responsibility through content analysis (Campopiano & de

Massis, 2015; Landrum & Ohsowski, 2018; Torelli et al., 2020; Xie et al., 2019), while more recent studies have dealt with issues related to intellectual capital (Abhayawansa & Guthrie, 2016; Alvino et al., 2020; Guthrie et al., 2007). This type of analysis aims to define the tone (positive, negative, or neutral) of a certain language and is also referred to as the “tone at the top”, referring to the atmosphere created by administrators and CEO leadership (Du & Yu, 2021; Hunton et al., 2011).

Studies of corporate reporting have used these analyses to correlate them with other business-related indicators, such as financial (Siueia et al., 2019) and non-financial performance (Ren et al., 2020), report readability (Ding et al., 2022), and some governance indicators (Rajesh, 2020), proposing two different theoretical approaches: impression management (Edgar et al., 2018; García-Sánchez & Araújo-Bernardo, 2020; García-Sánchez & Martínez-Ferrero, 2018) and incremental information (Arena et al., 2015; Hummel et al., 2017; Lehavy et al., 2011). In a corporate reporting context, impression management is the discretionary disclosure strategy that attempts to put in place an opportunistic behavior to control and manipulate the impression conveyed to users of financial and non-financial information by providing external stakeholders with biased disclosure (Clatworthy & Jones, 2001; Merkl-Davies & Brennan, 2007). This approach assumes that managers are motivated or want to manipulate the tone of corporate reporting so that users of corporate reporting perceive it in a more favorable light, not being able to distinguish between accurate or distorted reporting (Campopiano & de Massis, 2015). In contrast, the incremental information approach is grounded on the assumption that preparers (i.e., managers) provide external stakeholders with additional information compared to that mandated by law or regulations to reduce the information asymmetry between managers and other stakeholders, who will then be able to make better-informed decisions based on the incremental information (Merkl-Davies & Brennan, 2007). The incremental information approach assumes that in the marketplace investors can assess reporting bias, so that manipulations of information, including impression management, cannot exist; instead, managers are also incentivized to provide transparent disclosure to increase their compensation and reputation. Studies on NFD, in terms of tone and readability, are still lacking, especially for specific industries.

Evidence from prior studies put forward that the composition of the board of directors could affect NFD textual attributes. Katmon and others have found that the average age of directors sitting on the board and their national diversity are negatively associated with the readability of NFDs issued by Malaysian companies (Katmon et al., 2019). Nadeem stressed that the presence of women on the board positively affects the readability of the narrative of 10-K reports (Avrampou et al., 2019). Furthermore, Bassyouny and colleagues argued that the presence of women on the board can mitigate a biased tone of disclosure, and hence an impression management approach, in the NFD (Bassyouny et al., 2020). Board size is another feature of board composition which positively affects textual attributes (namely, the completeness) of sustainability-related disclosure (Abeysekera, 2010).

Within this context, the banking sector is often excluded from empirical research due to its dedicated regulation, while at other times it is the subject of study within a broader financial sector; to the best of our knowledge, only a few reports produced on non-financial first statements deal with the banking sector (Deloitte - SDA Bocconi, 2019; Venturelli, 2019). The latest stream of literature has focused on the various factors that can affect the application of the NFD to the financial sector (Rosati & Faria, 2019). However, as far as we know, there are not many studies focused on the impact of the presence of women, the average age of governing bodies, and the size of board of directors on non-financial reporting in the banking sector.

2.3. Hypothesis development

To investigate the relationships between board composition and some textual attributes of NFDs, following the prior literature, we differentiated the attributes of disclosure into conciseness, completeness, balance, and readability (Melloni et al., 2017), since these can vary systematically with respect to corporate performance (Wang et al., 2018). Consistent with the impression management approach, the presence of a certain correlation between negative company performance and attributes of disclosure should suggest a tendency to provide less information when company results are negative. Conversely, if negative performance does not affect disclosure synthesis, this would be evidence that corporate

disclosure is used to mitigate the effects of information asymmetries, in line with incremental information approaches (Beretta et al., 2019).

Relationship between disclosure completeness and board composition

Prior research has analyzed the relationship between the completeness of NFDs and corporate performance (Evans et al., 2022). Previous studies, in fact, have pointed out that one of the most concerning issues is the lack of completeness in the information disclosed (Knebel & Seele, 2015), while Akhtaruddin and colleagues suggest that larger firms are providing more complete reports (Akhtaruddin et al., 2009). Other studies have found a positive relationship between some features of corporate governance (such as audit committee independence) and the quantity of information disclosed (Buallay, 2019). According to previous studies (Carter et al., 2002; Schippers et al., 2003), board diversity could foster discussion and turn into better monitoring and understanding of the external environment, and consequently of management (Schippers et al., 2003), especially with reference to larger boards of directors and an increase in the female participation on the board (Abeysekera, 2010). However, other studies have found that board age and national diversity are negatively associated with the quality of NFDs (Katmon et al., 2019).

To test whether the impression management or the incremental information approach applies regarding the link between board characteristics and completeness, the following hypotheses have been developed:

Hypothesis 1a: There is a positive relationship between board composition and the completeness of the NFD (incremental information approach).

Hypothesis 1b: There is a negative relationship between board composition and the completeness of the NFD (impression management approach).

Relationship between readability and board composition

The readability studies, on the other hand, have looked at investor reactions to the textual content of various corporate reports (Lehavy et al., 2011), or at the characteristics of the

reports themselves, often using readability indices. Many of these studies have highlighted a certain lack of readability in the reports analyzed (Cheung & Lau, 2016), which results in information overload for investors and generates a blurring effect of negative information (Wang et al., 2018). Investor reactions to negative information are thus mitigated because of the difficulty in reading and interpreting the reports (du Toit, 2017), which thus are not necessarily read or considered useful by their users (Anderson, 1998). According to previous studies, the board composition could have an impact on the readability of NFDs (Abeysekera, 2010; Katmon et al., 2019). Larger boards are associated with the disclosure of more strategic information, a higher quality of narrative disclosure, and thus increased readability (Abeysekera, 2010; Ezat, 2019). The presence of women on the board could increase the readability of NFDs (Nadeem, 2022). However, as argued by previous studies, the quality of NFDs could be negatively affected by board age and nationality diversity, thus decreasing NFD readability (Katmon et al., 2019).

We expect that more transparent NFDs will also provide additional and relevant information to external stakeholders, hence reducing the information asymmetry in line with the incremental information approach. Foggier NFDs, on the other hand, hinder opportunistic behavior, consistent with the impression management approach.

To test whether either the impression management or the incremental information approach applies regarding the link between board characteristics and transparency, the following hypotheses have been developed:

Hypothesis 2a: There is a positive relationship between the board composition and the readability of the NFD (incremental information approach).

Hypothesis 2b: There is a negative relationship between the board composition and the readability of the NFD (impression management approach).

Relationship between conciseness and board composition

Regulators, investors, and academics are devoting increasing attention to the conciseness of the non-financial reports (Sun et al., 2022). Indeed, some reporting frameworks are including it as a principle (IIRC, 2013), or they are emphasizing the use of processes (such as

materiality) to realize conciseness (Smeuninx et al., 2016). However, being concise and comprehensive "seems a dilemma" (Sun et al., 2022, p. 20). We expect that more concise – i.e., shorter – NFDs also provide additional and relevant information to external stakeholders, hence reducing the information asymmetry in line with the incremental information approach; whereas less concise – i.e., longer – NFDs hinder opportunistic behavior, consistent with the impression management approach.

Although conciseness is the subject of numerous studies, both for its measurement and for its effect on business performance, financial (Abu Bakar & Ameer, 2011; Plumlee et al., 2015) and otherwise (Melloni et al., 2017), a lack of studies investigating the role of board composition on the conciseness of NFDs have led us to develop the following hypotheses:

Hypothesis 3a: There is a positive relationship between board composition and the conciseness of the NFD (incremental information approach).

Hypothesis 3b: There is a negative relationship between board composition and the conciseness of the NFD (impression management approach).

Relationship between balance and board composition

Previous studies suggest that companies can influence the perceptions of users of financial statements, and managers may use certain features of language to manipulate information (Herath & Albarqi, 2017; Hummel et al., 2017; Patelli & Pedrini, 2015).

The manipulation of the disclosure could be reduced in the presence of a strong corporate governance (García Osma & Guillamón-Saorín, 2011). Previous studies have found gender balance in the management of the company as supportive to the incremental information approach (Bassyouny et al., 2020), since a more consistent female presence could reduce the tone of optimism. In this way, a more positive tone than is required or language that is not as clear helps to obfuscate some information that would be interpreted negatively by investors. Such behavior is identified in the literature as the “obfuscation” of information when the company's performance is negative (Bloomfield, 2002). With respect to NFDs, (Abu Bakar & Ameer, 2011) verified that companies with limited income, liquidity, and growth achieve limited results in terms of the readability of reports, while Cho et al. (2010) highlights that

poor environmental performance is found in entities that use an optimistic tone in their presentations.

Some studies have analyzed the composition of the board with reference to impression management in the corporate business model (Melloni et al., 2016) and have identified that board size conditions the optimistic tone of disclosure (Martikainen et al., 2022).

We wanted to investigate the relationships between DNF textual attributes and other variables in order to accept one or the other theoretical model of reference (impression management vs. incremental approach). Thus, the following hypotheses have been developed:

Hypothesis 4a: There is a positive relationship between the board composition and the optimistic tone of the NFD (incremental information approach).

Hypothesis 4b: There is a negative relationship between the board composition and the optimistic tone of the NFD (impression management approach).

3. Methodology

3.1. Sample selection and data collection

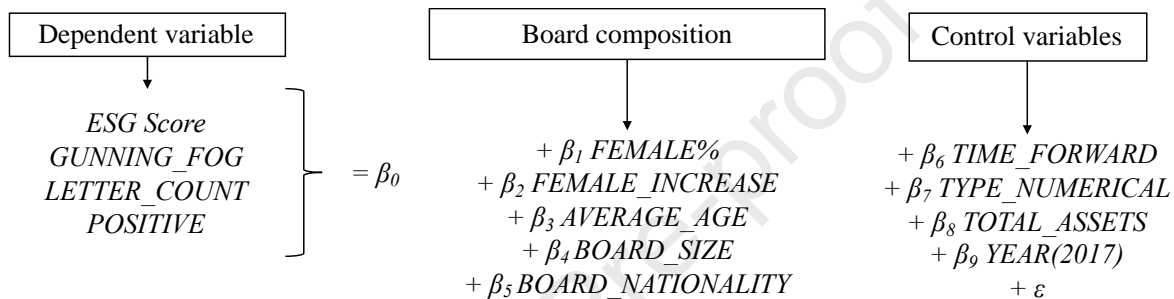
All the NFDs of Italian banks published after the transposition of EU Directive 95/2014 into Legislative Decree 254 of 30 December 2016 were considered in this study. Italy provides a unique opportunity to analyze this topic in mandatory settings since it is one of the biggest industrial European countries mandated by Directive 2014/95/EU.

The data collection phase was performed in two phases. First, the list of all the Italian banks pursuant to Legislative Decree n. 254/2016 was identified through the NFD Observatory Database (<https://www.osservatoriodnf.it/it/home/>), which collects NFDs published by Italian companies which are mandated by law, in collaboration with Italian and international universities and associations. A total of 40 Italian banks required to comply with Directive 2014/95/EU were identified. The NFDs were then manually downloaded from the companies' websites independently for all the years under investigation (from 2017 to 2020). Second, financial and board composition information not available in the documents listed above was

collected from Orbis. Only banks for which all the information required was available for all the years of analysis were retained. Hence, the final sample is composed of a total of 29 Italian banks.

3.2. Variable measurements

The models that were run in the analysis are represented and described below.



Completeness, Reading difficulty, Conciseness and Balance represent the dependent variables in the multivariate regression.

First, the *completeness* of the disclosure was captured by the ESG Score (Ioannou & Serafeim, 2012; Melloni et al., 2017). The determination of completeness consists in the analysis of the extent of information disclosed, measured by the coverage of specific topics. The ESG Score was constructed as the percentage of text units of the NFDs devoted to environmental, social, and governance information, as defined by the TEG EU Taxonomy and the text of Directive 2014/95/EU (European Commission, 2018), over the total number of text units of the NFDs. Examples of keywords adopted are provided in Appendix A.

Second, previous studies on the corporate narrative disclosure have analyzed the style of the disclosure by focusing on the readability of the documents under investigation (de Franco et al., 2015; Li, 2008; Twedt & Rees, 2012). Thus, the *Reading Difficulty*, intended as the inverse of readability, of the NFDs has been adopted by analyzing the Gunning Fog Index (Twedt & Rees, 2012), which is calculated as follows: "Gunning Fog = 0.4 * [(words / sentences) + 100 * (complex words / words)", where complex words are represented by those

with three syllables or more. Thus, "the index indicates the number of years of formal education a reader of average intelligence would need to read the text once and understand that piece of writing with its word-sentence workload"(Melloni et al., 2017). The reading difficulty of the Gunning Fog Index is interpreted as follows: higher than 18 - unreadable; between 14 and 18 - difficult; between 12 and 14 - ideal; between 10 and 12 - acceptable; and between 8 and 10 - childish.

Third, *conciseness* was captured by the length of the report (de Franco et al., 2015; Melloni et al., 2017). It has already been adopted in the literature to measure the amount of information contained in non-financial reports given the ease with which it can be computed and interpreted (Stacchezzini et al., 2016). There is an inverse relationship between the conciseness and the length of the report, meaning that the longer the report is, the lower its conciseness.

Finally, previous studies adopted the optimism score as a proxy for the verbal tone measure (Cho et al., 2010; Melloni et al., 2017). For this purpose, the *balance* of the reports was measured by the positive tone of the disclosures, computed using the "(Positive – Negative)/(Positive + Negative)" ratio, which is considered as a relative measure that can be implemented to identify if a text unit is relatively positive or negative (greater or lower than 0), as well as the magnitude of the relative sentiment (Massaro et al., 2015). Thus, this measure is used to emphasize the positive (optimism) versus negative (pessimism) nature of corporate communication (Caglio et al., 2020).

Independent variables have been added to capture the *board composition* of the banks in the sample. This study follows the call from previous research to consider different diversity dimensions simultaneously (Ashkanasy et al., 2002; S. E. Jackson & Joshi, 2001; Ruigrok et al., 2007). For this purpose, differences in terms of gender, age, and nationality have been included in the analysis. First, consistent with previous studies (Vitolla et al., 2020), the presence of women on the board of directors has been analyzed. In particular, the variable "Female%" has been included to capture the percentage of female members of the board of directors, while the variable "Female Increase" captures whether there has been an increase in the number of female members on the board of directors with respect to the previous year. Second, another common board diversity characteristic measure is represented by board age.

Since this measure is one of the most important observable features of BoD diversity (Kang et al., 2018), studies have been conducted to analyze its impact on corporate performance (Ali et al., 2014) and disclosure characteristics (Giannarakis, 2014). Thus, the variable Average Age has been added to capture the average age of the members of the board of directors. Third, in line with previous research (Cheng & Courtenay, 2004; Jensen, 1993; Lipton & Lorsch, 1992; Yermack, 1996), the variable “Board Size” has been added to measure the number of board members. Indeed, as argued by scholars in the field (Jensen, 1993; Lipton & Lorsch, 1992), the number of components of the board of directors could have an impact on the features of NFDs. Finally, consistent with previous studies (van Veen & Elbertsen, 2008), the nationality of the board members has been analyzed, since increasing board diversity, also in relation to nationality, could have an impact on board processes and dynamics. In particular, the variable “Board_Nationality” is a dummy variable that captures the presence of a non-Italian nationality.

To conclude, *control variables* have also been added in the analysis. First, the time orientation of text units in the reports analyzed was captured by the variable “Time_Forward” (Arena et al., 2015). Second, the type of evidence is captured by the variable “Type_Numerical”, which represents the numerical text units. The data used in this stage are those emerging from the content analysis (Melloni et al., 2017). Third, since previous studies argued that public pressures on ESG topics is higher for larger firms, “Total Assets” have been included as a proxy for the size of the banks in the sample. To conclude, the dummy variable “Year (2017)” has been added to control for the effect of time. Table 1 presents all the variables that have been used, their definitions, and their measurement.

Please add Table 1 around here

3.3. Data analysis

Data analysis was carried out over two steps: first, textual attributes of the NFDs were assessed through a content analysis, and second, statistical analysis through descriptive statistics and multivariate regression with panel data was run.

Content analysis

In the first stage, a content analysis was performed to assess the textual attributes of the disclosures. In line with previous studies, the unit of analysis considered is the text unit (a sentence including a single piece of information) (Abhayawansa & Guthrie, 2016). Coding was performed using NVivo12 to increase the accuracy and transparency of the data analysis process by providing a reliable and general picture of the data.

Table 1 presents the categories of information that have been coded.

Please add Table 2 around here

An example of keywords adopted for coding the text units in this phase is provided in Appendix A. In addition, in line with previous studies (Hussein El-Sayed et al., 2021), the readability metrics of the NFDs have been calculated using the software Readable.

Statistical analysis

In a second stage, the data was analyzed performing a multivariate regression model with panel data for the years from 2017 to 2020. Consistent with previous studies (Arellano Manuel, 1993), the Hausman test was performed to decide whether to use fixed or random effects. Before running the multivariate regression, some pre-estimation analyses were conducted. First, the Manova was conducted to test if the response variables were altered by the observer's manipulation of the independent variables (French et al., 2008). In addition, the Breusch-Pagan test of independence was run. According to previous studies, if the Breusch-Pagan test is significant, the residuals of the dependent variables are not independent of each other. Second, Variance inflation factors (VIFs) were calculated to gauge the extent of multicollinearity between modelled variables. Previous studies have found that further investigation is needed for VIFs exceeding 4, while VIFs greater than 10 are problematic because they indicate serious multicollinearity requiring correction (Gujarati & Porter, 2003).

The software used for the analysis is Stata/SE 13.0.

4. *Empirical findings*

4.1. *Descriptive statistics*

Table 3 summarizes the descriptive statistics for the analyzed NFD issued by Italian banks in the period 2017-2020.

Completeness average, captured by the mean ESG score, is rather low (0.1069), with a rather high standard deviation, considering the low maximum value (0.2987).

The average reading difficulty, expressed by the Gunning_Fog variable, is 18.4154 years of education – which suggests that NFDs of Italian banks are hard to read – with a limited standard deviation (1.7673). However, this result is in line with other studies on the reading difficulty of annual reports (Ajina et al., 2016).

Conciseness is, on average, rather high (5.2025) in the Italian banking sector, given that its values range between 4 and 6. This result is in line with prior studies addressing the banking industry as a highly regulated one, and hence one that requires more information to be provided to stakeholders (Perrault Crawford & Clark Williams, 2010).

The NFDs of Italian banks are rather balanced since the mean value of the disclosure tone - positive - is close to zero (0.0781). However, the standard deviation is rather high (0.1185), showing a differentiated situation in the analyzed sample.

The average percentage of female board directors variable is rather low (0.2561). However, a major concern can be associated with the minimum number of women sitting on the board of Italian banks, i.e., zero. This worrying information is somehow mitigated by the relatively high average increase of women on the board of Italian banks (0.4569).

With regards to the age of the directors, the mean value (62 y.o.) is above that for similar studies in the banking industry (57 y.o.; (Arnaboldi et al., 2020)). Furthermore, the minimum (47 y.o.) and maximum values (84.5 y.o.) are remarkably higher compared to that for EU counterparts (min = 35.8 y.o.; max = 69.5 y.o.).

The average board size of Italian banks (10.6293) is in line with prior studies (see, e.g., Zalata & Roberts, 2015). However, there is high variability in the analyzed sample, also mirrored by the large gap between the minimum (1) and maximum number (20) on the board of directors.

Board nationality average (0.3276) is below the theoretical average (0.5), suggesting that Italian banks primarily appoint national directors to their boards.

The Italian banking sector is characterized by diversified situations in terms of size (avg = 1,420 Euro millions), with a high variability (Std.Dev. = 12,200 Euro millions).

As expected, the average amount of forward (171) text units is high. Nonetheless, numerical disclosure (636 text units) exceeds the number of text units with an orientation to the future, highlighting the relevance of numerical information in this sector (Woods & Marginson, 2004).

Please add Table 3 around here

4.2. Correlation analysis

The pairwise correlation coefficients emerging from the Pearson analysis between the variables are reported in Panel A of Table 4, while the tetrachoric correlation of the binary variables are reported in Panel B of Table 4.

First, the ESG coverage is positively correlated with the positive tone of the disclosure, board composition, such as the percentage of women on the board of directors, its size, the average age of the members, narrative features, such as forward-looking orientation and numerical information.

Second, similarly, the length of the NFD is positively correlated with the size of the board of directors and with narrative features, such as forward-looking orientation as well as numerical information.

Third, the positive tone of the disclosure of Italian banks is positively and strongly correlated with the readability of the report(s) and the percentage of women on the board of directors.

In addition, the following positive correlations between independent variables have been observed: the average age of the board of directors with the percentage of women on the board of directors; the number of members of the board of directors with the percentage of women on the board of directors; the number of forward looking text units with the percentage of women on the board of directors and its size; the number of numerical text

units with the percentage of women on the board of directors, the size of the board, and the average age and number of forward looking text units.

Please add Table 4 around here

4.3. Multivariate analysis

A set of panel data regression analyses on the NFD issued by Italian banks pursuant to Legislative Decree no. 254/2016 from 2017 until 2020 was run.

First, the MANOVA was conducted, and the relative Breusch-Pagan test of independence demonstrates the appropriateness of conducting a multivariate analysis (Appendix B). Second, the multicollinearity between modeled variables was checked by means of the variance inflation factors (VIFs). Since VIFs were all lower than 4, there is no evidence of multicollinearity (Table 5).

Please add Table 5 around here

Results of the Hausmann test suggested the use of the random effects option for Models 2, 3, and 4, which implies that a random variable, uncorrelated with the explanatory variable, explain the individual-specific effect between entities. Instead, the Hausmann test suggested the use of the fixed effects option for Model 1 (Table 6 - Baltagi et al., 2003), which implies variation among individuals but not across time. However, the post-estimation test, namely, the Breusch and Pagan Lagrange-multiplier test for random effects (Breusch & Pagan, 1980), suggested using the OLS for the Models 3 and 4, implying that there is only one constant term in common among the individuals without differences among the constituent banks in the panel.

Prior literature has concluded that the ‘gold standard’ of fixed effect should be questioned in social sciences by adopting random effect models to include the complexity of the context in the analysis (Bell & Jones, 2015). This is the case of Model 2, which analyzes the impact of board composition on the reading difficulty, where differences in the analyzed sample are

taken into account, consistent with prior literature investigating the role of intellectual capital and corporate governance mechanisms on the readability of annual reports (Dalwai et al., 2021). On the other hand, with regard to completeness, Model 1 adopts fixed effects to account for time differences, since banks could have adapted their information technology systems to provide more complete sustainability-related information over time (Dao et al., 2011), or there might have been a time-dependent learning effect in the provision of more complete sustainability-related information (Luo et al., 2016). Finally, the adoption of an OLS pooled regression model with panel data for Models 3 and 4 is quite common in sustainability reporting literature, especially with regards to the features of conciseness and balance (Melloni et al., 2017).

Please add Table 6 around here

In terms of performance, at the coefficient level the results of the models analyzed are presented in Table 6 and discussed below.

First, empirical findings show that the *completeness* of the report is positively and statistically significantly impacted by the increase in women on the board of directors and negatively and statistically significantly impacted by the percentage of women on the board of directors, board size, and the numerical disclosure. Thus, “Hypothesis 1a: There is a positive relationship between the board composition and the completeness of the NFD (incremental information approach)” and “Hypothesis 1b: There is a negative relationship between the board composition and the completeness of the NFD (impression management approach)” can both be partially accepted.

Second, empirical findings show that the *reading difficulty* of the report is positively and statistically significantly impacted by the percentage of women on the board of directors and by the first year of mandatory disclosure, while it is negatively and statistically significantly impacted by the future orientation of the NFD. Thus, “Hypothesis 2a: There is a positive relationship between the board composition and the readability of the NFD (incremental information approach)” cannot be accepted, while “Hypothesis 2b: There is a negative

relationship between the board composition and the readability of the NFD (impression management approach)" is partially accepted.

Third, empirical findings show that the *conciseness* of the report is statistically significantly impacted by the time orientation of the report, meaning that an NFD more oriented to the future is associated with a less concise report. However, variables that capture the board composition do not show a statistically significant p-value. Thus, "Hypothesis 3a: There is a positive relationship between the board composition and the conciseness of the NFD (incremental information approach)" and "Hypothesis 3b: There is a negative relationship between the board composition and the conciseness of the NFD (impression management approach)" cannot be accepted.

Finally, empirical findings show that the *positive tone* of the report is positively and statistically significantly impacted by the future orientation of the NFD and negatively and statistically significantly impacted by the percentage of women on the board of directors and by the numerical disclosure. Thus, "Hypothesis 4a: There is a positive relationship between the board composition and the optimistic tone of the NFD (incremental information approach)" cannot be accepted, whereas "Hypothesis 4b: There is a negative relationship between the board composition and the optimistic tone of the NFD (impression management approach)" can be partially accepted.

5. Discussion

Completeness, transparency, conciseness, and disclosure tone are relevant textual attributes of sustainability reporting since they proxy the quality of NFDs. Results from prior studies have found that firms adopt strategic disclosure behaviors both to hinder poor sustainability performance and to show a better image related to positive sustainability performance, in line with an impression management approach, rather than to provide additional information, according to the incremental information approach (Melloni et al., 2017). Results from this study show that different board compositions affect differently some of the most investigated textual attributes of NFDs disclosed by Italian banks. Recent studies argue that sustainability within companies is now considered either a board or a CEO-level consideration among the

core activities and that corporate governance deserves further attention from scholars investigating the textual attributes of NFDs (Evans et al., 2022). This holds true also in an underexplored industry, such as the financial one, especially in a mandatory NFD regime. Indeed, many studies on CSR reporting adopt content analysis and find that NFDs could bring additional information to stakeholders to be used to support their decisions, in line with an incremental information approach (Campopiano & de Massis, 2015; Manetti & Toccafondi, 2014).

This study complements previous ones by providing evidence that it is not the enhancement of board composition *per se* that improves the *completeness* of NFDs but the management of its specific features, such as the increase in the percentage of women on the board, which enhances a bank's NFD quality (Buallay, 2019). As previously argued, financial sectors are increasingly used as means to achieve social goals (Schoenmaker & Schramade, 2019), and investors are becoming increasingly "socially responsible". According to previous studies, a higher disclosure of sustainability-related information could provide benefits for business (Clark et al., 2014; van Beurden & Gössling, 2008). Thus, we argue that banks need to focus their attention on specific governance mechanisms: namely, an increase in the percentage of women on the board, which would support the incremental information approach, and not focus too much attention on others – such as the board size, the percentage of women on the board, and the amount of numerical information – that seem to be more consistent with the impression management approach by limiting the completeness of non-financial reports.

As for the *transparency* of the NFDs of Italian banks, mixed results were found. First, higher readability of the NFD is observed when the disclosure of the sustainability-related information has a future orientation, which is in line with the incremental information approach since, according to previous studies, forward-looking information helps investors understand firm performance and future earnings (Hussainey et al., 2003; Muslu et al., 2019). Second, results from this study seem to corroborate the impression management approach found in prior research, due to less readability of the corporate reporting associated with a higher presence of women on the board of directors (Cheung & Lau, 2016).

Although no significant results could be found, according to the generally accepted standard levels, with regards to the relationship between board composition and the *conciseness* of Italian bank NFDs, this textual feature is negatively affected by future-oriented sustainability-related disclosure. This result could be explained by a disclosure strategy aimed at providing incremental information to stakeholders regarding the future sustainability-related issues affecting or affected by Italian banks. However, it could also mirror an impression management strategy, where the senior management decides to provide greater and less precise future-oriented information to bias the stakeholders. Similar findings were also found in prior studies (Melloni et al., 2017), where lower conciseness was associated with poorer financial performance, in line with the impression management approach.

Moreover, results from this study support prior research that argues that, although the *tone of disclosure* can be used to bias decision makers (Herath & Albarqi, 2017; Hummel et al., 2017; Patelli & Pedrini, 2015), the manipulation of the disclosure could be reduced in the presence of a strong corporate governance (García Osma & Guillamón-Saorín, 2011). According to prior literature, an NFD with a more positive tone could signal an opportunistic behavior to manipulate disclosure and obfuscate negative ESG performance (Herath & Albarqi, 2017; Hummel et al., 2017; Patelli & Pedrini, 2015). This study complements results from previous studies by showing that a specific board composition can mitigate the adoption of impression management strategies regarding the tone of disclosure. This is the case with a higher representation of women on the board (Bassyouny et al., 2020) together with a strong reliance on quantitative disclosure, which is supposed to be more relevant than a qualitative disclosure (Bozzolan et al., 2003; Hutton et al., 2003).

6. Conclusions

This paper has sought to investigate the relationships between board composition and some textual attributes of NFDs in the banking industry. Results from the multivariate analysis on 29 Italian banks in the period 2017-2020 have provided both theoretical and managerial insights.

Without *a priori* assumptions on the role of corporate governance in affecting the quality of the NFD, we found evidence of board configurations which can be more conducive to incremental information approaches, and other evidence that was more suitable for impression management strategies. Overall, the presence of women on the board of Italian banks mirrors high quality NFDs, captured by their textual attributes, which is consistent with the incremental information approach, although some further specification needs to be provided. On the one hand, empirical evidence has added new knowledge to the extant literature by providing support to the argument that it is not the increase in any board composition *per se* that improves the quality of the NFD, but the management of specific features that does so, such as the increase over time of women on the board, which enhances a bank's NFD quality (Buallay, 2019). On the other hand, results from this study highlight that board size and the percentage of women on the board can become tools for implementing impression management strategies when it comes to the completeness and transparency of NFDs.

Empirical evidence from this study contributes to the literature on disclosure strategies and theories, with particular regard to the impression management vs. incremental information approaches (Brennan et al., 2009; Merkl-Davies & Brennan, 2007; Moreno et al., 2019). Since investors take decisions based on the content of NFD, the quality of this report is utmost importance (Abhayawansa, 2011; Melloni, 2015; Abhayawansa and Guthrie, 2016a, b). Hence, this study highlighted some of the features of NFD which could mitigate the risk of disclosure manipulation, enhancing its quality. The evidence provides additional knowledge on the role of some characteristics of corporate governance that explain some of the most investigated textual attributes of NFDs in the financial sector (Melloni et al., 2017). It also contributes to filling in the gap in the literature related to the lack of knowledge about NFDs in the banking industry (Schröder, 2022; Urban & Wójcik, 2019) by providing an overview of the adoption of the NFD by Italian banks, the related level of quality, beyond experience, format, and framework (Schröder, 2022), and its drivers. Moreover, our results develop new knowledge on the role of NFDs in a mandatory regime, whereas most of the literature has focused on voluntary disclosure. In doing so, we complement the few prior studies that exist in such a context (Doni et al., 2019), providing evidence of the evolution of NFD quality

after the introduction of the mandatory requirement. Finally, this study shows evidence of the role of corporate governance mechanisms in affecting NFD quality in a specific civil law country, i.e., Italy, where the quality of NFDs is supposed to be higher compared to common law countries (Turzo et al., 2022).

Both managerial and policy implications can be drawn from this study. Managerial implications are related to the incentive for financial institutions to (re-)design some governance features, in particular board composition, to increase NFD quality in terms of transparency and comparability. Policy implications are related to the opportunity for policy makers to develop international policies and regulations which combine high-quality sustainability-related information and governance features of financial institutions. In fact, more and more standard setters are focusing their attention on corporate governance mechanisms aimed at mitigating the risk of greenwashing that characterizes some sustainable finance products and institutions (European Commission, 2022; SEC, 2022) Hence, this study informs policy makers of the science-based practices that can enhance the quality of NFDs.

This study is not without its limitations, which can address future research paths. First, the context of analysis refers to a single industry, banking, in one single country, Italy. Hence, the generalization of results outside this context should be done cautiously. Therefore, future studies could investigate whether similar results apply in different contexts, either within or outside the scope of Directive 2014/95/EU. More specifically, it would be interesting to compare countries with different regulations on corporate governance mechanisms, for instance, with regard to gender quotas. Moreover, this study focuses on some features of board composition, such as board size, the average age of directors, and female representation on the board. However, previous studies have identified the existence of both internal and external governance mechanisms (Anderloni et al., 2020). Thus, other governance mechanisms could be analyzed to see if committees, policies, and procedures, in addition to board composition, can influence the quality of NFDs. Moreover, an additional limitation of this study refers to the methodological choice of the models. Indeed, the adoption of the OLS model allows regression coefficients to be estimated while ignoring the nature of the cross-section and time series of the data, so the error term captures everything, while in the fixed-

effects model the intercept is different for each unit, but constant in time and, thus, the estimated coefficients cannot be biased due to omitted time invariant characteristics and in the random-effects model the intercept is stochastic (Marcellino, 2021). Thus, the adoption of different econometric models to test the different hypotheses could lead to different theoretical implications. In addition, a larger sample size, including banks operating in different countries, or a longer time span could provide more generalizable results. Moreover, since the SFDR will come into force starting in 2023, it would be interesting to investigate the change in the adoption of corporate governance mechanisms by financial institutions after the implementation of the SFDR.

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APPENDIX A

The table below is an extraction of the keywords list used in the coding phase.

<i>ESG Score</i>	<u>Environmental</u> emissions fossils fuel green eco-friendly climate risks green bond pollution ... <u>Social</u> violations weapons tobacco smoke cigarettes health safety accessibility improper use ... <u>Governance</u> board diversity committee diversity gender women age nationality board independence ...
<i>Positive Words</i>	able abundance acclaimed accomplish achieve adequately advancement advances ...

<i>Negative Words</i>	abandon abandoned abandoning abandonment abandons abdicated abdicates abdication ...
<i>Forward-looking</i>	about to happen accelerate aim anticipate chance coming months coming year commitment confidence ...

APPENDIX B

Breusch–Pagan test for Models 1 to 4 of the MANOVA

	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Completeness						
Female%	-0,0996	0,0603	-1,6500	0,1010	-0,2192	0,0199
Female_Increase	0,0214	0,0168	1,2700	0,2070	-0,0120	0,0547
Average_Age	-0,0009	0,0014	0,6800	0,4980	-0,0036	0,0018
Board_Size	-0,0017	0,0021	0,8200	0,4140	-0,0058	0,0024
Board_Nationality	-0,0128	0,0175	0,7300	0,4640	-0,0475	0,0218
Time_Forward	0,0002	0,0001	1,8700	0,0650	0,0000	0,0003
Type_Numerical	-0,0001	0,0000	-4,3600	0,0000	-0,0001	0,0000
Total_Assets	0,0000	0,0000	-1,8300	0,0690	0,0000	0,0000
Year(2017)	0,0947	0,0212	4,4600	0,0000	0,0526	0,1367
_cons	0,1922	0,0930	2,0700	0,0410	0,0078	0,3765
Reading difficulty						
Female%	4,1992	1,2394	3,3900	0,0010	1,7417	6,6567
Female_Increase	-0,1032	0,3457	0,3000	0,7660	-0,7887	0,5823
Average_Age	-0,0387	0,0280	-1,3800	0,1700	-0,0941	0,0168
Board_Size	-0,0250	0,0429	0,5800	0,5620	-0,1100	0,0601
Board_Nationality	-1,0157	0,3592	-2,8300	0,0060	-1,7278	-0,3035
Time_Forward	-0,0044	0,0019	-2,3700	0,0200	-0,0081	-0,0007
Type_Numerical	0,0003	0,0003	1,0500	0,2950	-0,0003	0,0009
Total_Assets	0,0000	0,0000	2,0700	0,0410	0,0000	0,0000
Year(2017)	0,7580	0,4359	1,7400	0,0850	-0,1064	1,6224
_cons	20,7093	1,9113	10,8400	0,0000	16,9196	24,4989
Conciseness						
Female%	-0,2515	0,1576	-1,6000	0,1130	-0,5640	0,0610
Female_Increase	0,0683	0,0440	1,5500	0,1230	-0,0189	0,1554
Average_Age	-0,0003	0,0036	0,0900	0,9260	-0,0074	0,0067
Board_Size	-0,0009	0,0055	0,1700	0,8650	-0,0117	0,0099
Board_Nationality	-0,0183	0,0457	0,4000	0,6900	-0,1088	0,0723
Time_Forward	0,0014	0,0002	6,0800	0,0000	0,0010	0,0019
Type_Numerical	0,0000	0,0000	0,7400	0,4630	-0,0001	0,0000
Total_Assets	0,0000	0,0000	0,4900	0,6280	0,0000	0,0000
Year(2017)	0,0290	0,0554	0,5200	0,6010	-0,0809	0,1389
_cons	5,0393	0,2430	20,7400	0,0000	4,5574	5,5211
Balance						
Female%	-0,3961	0,0794	-4,9900	0,0000	-0,5535	-0,2386
Female_Increase	0,0332	0,0221	1,5000	0,1360	-0,0107	0,0772
Average_Age	-0,0009	0,0018	0,4800	0,6360	-0,0044	0,0027
Board_Size	-0,0013	0,0027	0,4700	0,6380	-0,0067	0,0042
Board_Nationality	0,0352	0,0230	1,5300	0,1290	-0,0104	0,0808

Time_Forward	0,0005	0,0001	4,4400	0,0000	0,0003	0,0008
Type_Numerical	-0,0001	0,0000	-2,9000	0,0050	-0,0001	0,0000
Total_Assets	0,0000	0,0000	0,4900	0,6250	0,0000	0,0000
Year(2017)	-0,0156	0,0279	0,5600	0,5780	-0,0710	0,0398
_cons	0,1669	0,1224	1,3600	0,1760	-0,0759	0,4097
Breusch-Pagan test of independence: $\chi^2(6) = 25.209$, Pr = 0.0003						

Table 1 : Variables

Variable acronym	Variable definition	Variable measurement
Dependent		
<i>Completeness</i>		
ESG Score	ESG disclosure Score	Percentage of the number of text units dedicated to ESG issues over the total number of text units
<i>Reading difficulty</i>		
Gunning_Fog	Gunning Fog Index	$0.4 * [(words / sentences) + 100 * (complex words / words)]$
<i>Conciseness</i>		
Letter_Count	Length	Logarithm of the number of letters of the reports
<i>Balance</i>		
Positive	Positive Score	$(Positive\ text\ units - Negative\ text\ units) / (Positive\ text\ units + Negative\ text\ units)$
Board composition		
Female%	Percentage of women in the Board of Directors	Percentage of female members of the Board of Directors
Female_Increase	Increase of women in the Board of Directors	Dummy variable equal to 1 if there is an increase in the number of female members of the Board of Directors with respect to the previous year, 0 otherwise
Average_Age	Age of the Board of Directors	Average age of the members of the Board of Directors
Board_Size	Members of the Board of Directors	Number of members of the Board of Directors
Board_Nationality	Nationality of the members of the Board of Directors	Dummy variable equal to 1 if the members of the Board of Directors have a nationality different from the Italian one, 0 otherwise
Linguistic attributes		
Time_Forward	Forward looking text units	Number of text units referring to the firm's prospects, strategy, and expectations.
Type_Numerical	Numerical text units	Number of text units presented in a numerical form.
Company information		
Total_Assets	Size	Total Assets (Source: Orbis)
Year(2017)	Year of publication	Dummy variable equal to 1 if the report has been published in 2017, 0 otherwise

Table 2: Definitions of content categories

ESG Score (Technical expert group on sustainable finance (TEG) ;Directive 2014/95/EU)	ESG Score	A text unit including information related to ESG issues.
Disclosure tone (IMF, 2020)	Positive	A text unit including good news for the company.
	Negative	A text unit including bad news for the company.
Time orientation (IMF, 2020; Krippendorff, 2013; Li, 2008, 2010a, 2010b; Loughran & Mcdonald, 2011)	Forward-looking	A text unit referring to the firm's prospects, strategy, and expectations.
Type of evidence (Beattie et al., 2004; Beretta et al., 2019)	Numerical	A text unit presented in a numerical form.

Table 3 - Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ESG Score	116	0.1069	0.1063	0	0.2987
Gunning_Fog	116	18.4154	1.7673	10.56	22.2
Letter_Count	116	5.2025	0.2640	4	6
Positive	116	0.0781	0.1185	-0.2175	0.6364
Female%	116	0.2561	0.1718	0	0.8462
Female_Increase	116	0.4569	0.5003	0	1
Average_Age	116	62.2197	6.3992	47	84.5
Board_Size	116	10.6293	4.4478	1	20
Board_Nationality	116	0.3276	0.4714	0	1
Time_Forward	116	171.4052	137.9759	24	862
Type_Numerical	116	636.6724	864.9273	18	6094
Total_Assets	116	1,420,000,000	12,200,000,000	1,987,131	131,000,000,000
Year(2017)	116	0.2500	0.4349	0	1

Table 4 - Correlation analysis

Panel A: Pearson correlation

	Letter_ Count	ESG Score	Positive	Gunning_ Fog	Female%	Average_ Age	Board_ Size	Time_ Forward	Type_ Numerical	Total_ Assets
Letter_ Count	1									
ESG Score	0.0125 0.8943	1								
Positive	0.1180 0.2070	0.2560	1							
Gunning_ Fog	0.1388 0.1372	0.0142 0.8801	0.3946 0.0000	1						
Female%	0.0709 0.4493	0.3597 0.0001	0.3313 0.0003	0.1460 0.1178	1					
Average_ Age	0.0220 0.8149	0.2461 0.0080	0.1064 0.2555	0.1343 0.1506	0.4197 0.0000	1				
Board_ Size	0.1805 0.0525	0.3795 0.0000	0.0958 0.3065	0.0602 0.5211	0.4586 0.0000	0.3388 0.0002	1			
Time_ Forward	0.6174 0.0000	0.3626 0.0001	0.1452 0.1199	0.1457 0.1187	0.3207 0.0004	0.1455 0.1191	0.4091 0.0000	1		
Type_ Numerical	0.4347 0.0000	0.5013 0.0000	0.0334 0.7216	0.0711 0.4485	0.2503 0.0067	0.1800 0.0532	0.3649 0.0001	0.7668 0.0000	1	
Total_ Assets	0.0700 0.4551	0.1394 0.1372	0.0307 0.7438	0.0448 0.6330	0.0666 0.4776	0.0689 0.4622	0.0950 0.3103	0.0354 0.7061	0.1306 0.1623	1

Panel B: Tetrachoric correlation

	Board_Nationality	Female_Increase	Year(2017)
Board_Nationality	1		
Female_Increase	0.1577 0.1488	1	
Year(2017)	-0.2732 0.1594	-0.4279 0.1402	1

Table 5 - Variance inflation factor (VIF)

Conciseness	VIF	1/VIF	Completeness	VIF	1/VIF	Balance	VIF	1/VIF	Reading difficulty	VIF	1/VIF
Time_Forward	2.69	0.372338	Time_Forward	2.79	0.358215	Time_Forward	2.69	0.372338	Time_Forward	2.69	0.372338
Type_Numerical	2.63	0.380666	Type_Numerical	2.66	0.376401	Type_Numerical	2.63	0.380666	Type_Numerical	2.63	0.380666
Female%	1.88	0.531285	Female%	1.91	0.522727	Female%	1.88	0.531285	Female%	1.88	0.531285
Board_Size	1.54	0.647470	Board_Size	1.53	0.652938	Board_Size	1.54	0.647470	Board_Size	1.54	0.647470
Year(2017)	1.50	0.664558	Year(2017)	1.52	0.657211	Year(2017)	1.50	0.664558	Year(2017)	1.50	0.664558
Average_Age	1.34	0.744634	Average_Age	1.35	0.738918	Average_Age	1.34	0.744634	Average_Age	1.34	0.744634
Female_Increase	1.26	0.793553	Female_Increase	1.26	0.793093	Female_Increase	1.26	0.793553	Female_Increase	1.26	0.793553
Board_Nationality	1.21	0.825648	Board_Nationality	1.21	0.825319	Board_Nationality	1.21	0.825648	Board_Nationality	1.21	0.825648
Total_Assets	1.07	0.931458	Total_Assets	1.10	0.909765	Total_Assets	1.07	0.931458	Total_Assets	1.07	0.931458
	1.68			1.70			1.68		Mean VIF	1.68	

Table 6 - Results of the panel data multivariate analysis

	Model 1 Completeness (ESG Score), fe	Model 2 Reading difficulty (Gunning_Fog), re	Model 3 Conciseness (Letter_Count), OLS	Model 4 Balance (Positive), OLS
Female%	-.2619 (.07815) 0.001***	4.2473 (1.0541) 0.000***	-.2462 (.1560) 0.115	-.3884 (.0783) 0.000***
Female_Increase	.04644 (.0182) 0.013**	-.1414 (.2542) 0.578	.0707 (.0435) 0.104	.0345 (.0220) 0.117
Average_Age	-.0019 (.0024) 0.432	-.0168 (.0296) 0.570	-.0001 (.0035) 0.970	-.0007 (.0018) 0.683
Board_Size	-.0080 (.003) 0.008***	-.0224 (.0383) 0.559	-.0009 (.0055) 0.874	-.0013 (.0027) 0.632
Board_Nationality	.0245 (.0399) 0.541	-.4006 (.4432) 0.366	-.0181 (.0461) 0.695	.0362 (.0229) 0.114
Time_Forward	-.0001 (.0001) 0.354	-.0042 (.0018) 0.020**	.0014 (.0002) 0.000***	.0005 (.0001) 0.000***
Type_Numerical	-.0000 (.0000) 0.008 ***	.0004 (.0002) 0.115	-.0000 (.0000) 0.470	-.0000 (.0000) 0.005***
Total_Assets	-9.11e-12 (6.07e-12) 0.137	-8.20e-12 (9.85e-12) 0.405	-1.33e-12 (1.64e-12) 0.419	1.17e-12 (8.30e-13) 0.158
Year(2017)	.0354 (.0240) 0.144	.7458 (.3302) 0.024	1200.277 (25775.65) 0.963	-.0134 (.0277) 0.627
Constant	.3951 (.1647) 0.019**	19.1211 (2.0431) 0.000***	.0300 (.0547) 0.583	.1559 (.1209) 0.197
R-sq	0.6446		0.4253	0.2744
N of groups (obs)	29 (115)	29 (116)	29 (116)	29 (116)
Hausman test fe vs re	0.0004***	0.8144	0.1551	0.4330
re post-estimation chibar2(01) Prob > chibar2		46.84 0.0000***	0.01 0.4696	0.00 1.0000
*, **, *** indicate a significance degree between 0.10 and 0.05, 0.05 and 0.01, and 0.01 and 0, respectively. Standard errors are reported in round parentheses. P-values are reported below the standard errors.				

APPENDIX A

The table below is an extraction of the keywords list used in the coding phase.

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<i>Positive Words</i>	able abundance acclaimed accomplish achieve adequately advancement advances ...

<i>Negative Words</i>	abandon abandoned abandoning abandonment abandons abdicated abdicates abdication ...
<i>Forward-looking</i>	about to happen accelerate aim anticipate chance coming months coming year commitment confidence ...

APPENDIX B

Breusch–Pagan test for Models 1 to 4 of the MANOVA

	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
Completeness						
Female%	-0,0996	0,0603	-1,6500	0,1010	-0,2192	0,0199
Female_Increase	0,0214	0,0168	1,2700	0,2070	-0,0120	0,0547
Average_Age	-0,0009	0,0014	0,6800	0,4980	-0,0036	0,0018
Board_Size	-0,0017	0,0021	0,8200	0,4140	-0,0058	0,0024
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Type_Numerical	-0,0001	0,0000	-4,3600	0,0000	-0,0001	0,0000
Total_Assets	0,0000	0,0000	-1,8300	0,0690	0,0000	0,0000
Year(2017)	0,0947	0,0212	4,4600	0,0000	0,0526	0,1367
_cons	0,1922	0,0930	2,0700	0,0410	0,0078	0,3765
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Female_Increase	-0,1032	0,3457	0,3000	0,7660	-0,7887	0,5823
Average_Age	-0,0387	0,0280	-1,3800	0,1700	-0,0941	0,0168
Board_Size	-0,0250	0,0429	0,5800	0,5620	-0,1100	0,0601
Board_Nationality	-1,0157	0,3592	-2,8300	0,0060	-1,7278	-0,3035
Time_Forward	-0,0044	0,0019	-2,3700	0,0200	-0,0081	-0,0007
Type_Numerical	0,0003	0,0003	1,0500	0,2950	-0,0003	0,0009
Total_Assets	0,0000	0,0000	2,0700	0,0410	0,0000	0,0000
Year(2017)	0,7580	0,4359	1,7400	0,0850	-0,1064	1,6224
_cons	20,7093	1,9113	10,8400	0,0000	16,9196	24,4989
Conciseness						
Female%	-0,2515	0,1576	-1,6000	0,1130	-0,5640	0,0610
Female_Increase	0,0683	0,0440	1,5500	0,1230	-0,0189	0,1554
Average_Age	-0,0003	0,0036	0,0900	0,9260	-0,0074	0,0067
Board_Size	-0,0009	0,0055	0,1700	0,8650	-0,0117	0,0099
Board_Nationality	-0,0183	0,0457	0,4000	0,6900	-0,1088	0,0723
Time_Forward	0,0014	0,0002	6,0800	0,0000	0,0010	0,0019
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Balance						
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Female_Increase	0,0332	0,0221	1,5000	0,1360	-0,0107	0,0772
Average_Age	-0,0009	0,0018	0,4800	0,6360	-0,0044	0,0027
Board_Size	-0,0013	0,0027	0,4700	0,6380	-0,0067	0,0042
Board_Nationality	0,0352	0,0230	1,5300	0,1290	-0,0104	0,0808

Time_Forward	0,0005	0,0001	4,4400	0,0000	0,0003	0,0008
Type_Numerical	-0,0001	0,0000	-2,9000	0,0050	-0,0001	0,0000
Total_Assets	0,0000	0,0000	0,4900	0,6250	0,0000	0,0000
Year(2017)	-0,0156	0,0279	0,5600	0,5780	-0,0710	0,0398
_cons	0,1669	0,1224	1,3600	0,1760	-0,0759	0,4097
Breusch-Pagan test of independence: $\chi^2(6) = 25.209$, Pr = 0.0003						

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Declaration of interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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