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RESEARCH ARTICLE

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Towards sustainable development: The role of directors' international orientation and their diversity for non-financial disclosure

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Abstract

Drawing on resource dependency and upper echelons theories, we examine the relationship between directors' international orientation (IO) and the scope of non-financial disclosures (NFD) in a two-tier board structure. Evidence from a regression analysis on a sample of non-financial firms listed on the Warsaw Stock Exchange for the 2014–2018 period shows that the IO of supervisory board members significantly and positively impacts the scope of NFD. We also find that women with IO influence the scope of NFD, whereas accounting and finance experience decreases the focus on NFD elements, especially environmental information. The results imply that both the IO of the supervisory board and the bundle of characteristics facilitate the move toward sustainable development. The findings of our study should be of interest to companies, regulators and policymakers to integrate sustainability practices into their corporate strategies.

KEYWORDS
corporate governance, diversity, international orientation, non-financial reporting, sustainable development, two-tier board system

1 | INTRODUCTION

Recent years have witnessed growing pressure from investors and standard-setting bodies toward the adoption of sustainable corporate behaviours (Al-Shaer & Zaman, 2018; Aureli et al., 2020; Helfaya & Moussa, 2017), thereby creating additional demand for the dissemination of useful information on the non-financial aspects of performance (Arena et al., 2015; Caputo et al., 2021; Lai et al., 2016). The recent regulatory shift in the direction of mandated non-financial information (e.g., Directive 2014/95/EU or Directive) (EU, 2014) has made it clear that a sustainable corporate strategy that addresses stakeholders' needs challenges traditional reporting practices (Aureli et al., 2020) by requiring more attention to non-financial disclosure (NFD) (Santamaria et al., 2021).

The board of directors is certainly the most important corporate governance mechanism, bearing the responsibility related to the adoption of a sustainable business strategy (Galbreath, 2018; Lagasio & Cucari, 2019) and the provision of transparent information (Helfaya & Moussa, 2017;

Pucheta-Martínez et al., 2021). The literature acknowledges that board diversity shapes firms' decision-making processes (Hafsi & Turgut, 2013). It enhances board task performance by ensuring better management of internal and external resources (Salancik & Pfeffer, 1978) and greater ability to meet stakeholders' expectations (Beji et al., 2020). Among the various dimensions of diversity, the international orientation (IO) of directors, connected to the knowledge and expertise gained abroad, is pivotal as it renders new resources and different perspectives that may lead to desired changes in firms' behaviours (Cumming et al., 2017). It favours the adoption of global solutions to local needs and helps the board to reach international standards, especially in times of intensive business internationalization (Hooghiemstra et al., 2019). It is also essential for corporate social responsibility (CSR) engagement by ensuring a broader CSR perspective as a social norm (Harjoto et al., 2018; Shahab et al., 2019; Zhang et al., 2018). Anecdotal evidence also suggests that international board diversification is becoming a priority, as underscored by Toyota's decision to hire a director with international experience on the board (Abkari, 2018).

However, existing research suggests a confounded picture of the role of directors with IO for disclosure practices: on the one hand, they may have greater monitoring and advising ability due to the relatively weaker local ties (Hooghiemstra et al., 2019; Miletkov et al., 2017); on the other hand, their value may be limited because of their distance to the firm (Masulis et al., 2012). A limitation of this line of research is that it focuses on the role of international experts or, alternatively, foreign board members sitting on one-tier boards, and it is mainly concerned with the implications of financial disclosure, thus neglecting the analysis of their influence on the company's ability to cope with the increasing demand for NFD. With a few exceptions (Katmon et al., 2019), this line of research also considers directors with IO as a homogeneous set, thus underscoring the role of the concurrent sources of diversity among directors' preferences relating to their gender, expertise, and country of experience for the measurement and reporting of sustainable business behaviours.

This study identifies the role of board IO on NFDs in a two-tier system where there is a separation between supervising directors and directors, owing to the responsibility for the day-to-day management of the company, by considering both international board members and members with long-term foreign professional experience. It also considers the extent to which their diversity influences the development of sustainable corporate behaviours through increased NFD policies. While we rely on resource dependency theory to conceptualize the importance of diversity in boards to disclose non-financial information (Hillman & Dalziel, 2003; Salancik & Pfeffer, 1978), we use upper echelons theory (Carpenter et al., 2004; Hambrick & Mason, 1984) to explain why the IO of supervisory board members may be particularly helpful in enhancing the scope of a company's NFD.

Our investigation takes advantage of the two-tier board structure[1] typical of Polish companies and relies on a sample of 98 non-financial companies listed on the Warsaw Stock Exchange (WSE) for the 2014–2018 period. We manually collect information from directors' biographies to capture the supervisory board IO and perform content analysis on NFD using an index tailored to the reporting requirement introduced by the Directive (Dumitru et al., 2017). We apply a generalized method of moments (GMM-SYS) methodology (Blundell & Bond, 1998) to address potential endogeneity and time persistence in the relationship between corporate boards and NFD.

Our results suggest that directors with IO on the board provide additional resources and different perspectives affecting a firm's attitude toward non-financial aspects of performance and disclosures. We also provide evidence that gender and experience in accounting and finance are the most relevant demographic and human capital features of directors with IO, which can explain their differential contributions to board monitoring and advising on NFD.

This study builds on and supplements the existing literature in several ways. It connects to studies on diversity- and sustainability-related outcomes (Atif et al., 2020; Bear et al., 2010; Bravo & Reguera-Alvarado, 2019; Galbreath, 2018; Harjoto et al., 2015; Helfaya & Moussa, 2017; Nadeem et al., 2020; Nuber & Velte, 2021) and adds a new dimension of board internationalization to the investigation of the link between board composition and NFD. The recent stream of literature mainly focuses on the role of gender diversity in addressing various CSR-related outputs (see Amorelli & García-Sánchez, 2021, for a review). We documented that the IO earned in a different corporate governance model might be useful for the move toward a sustainable two-tier corporate governance model. In particular, we contribute to the studies highlighting the benefits of foreign directors vis-à-vis CSR investments (Zhang et al., 2018) and performance (Beji et al., 2020) by showing that the appointment of directors with IO to supervisory boards may help to overcome management resistance and provide information to the supervisory board (Adams & Ferreira, 2007), thereby leading to the development of a more transparent NFD.

We also contribute to the strand of studies on corporate disclosure (Hooghiemstra et al., 2019; Masulis et al., 2012) by investigating the role of board IO and, unlike previous studies (Katmon et al., 2019), the diversity among directors with IO in conceptualizing sustainable business strategies and establishing transparent NFD policies. In particular, our approach, based on the analysis of the scope of non-financial information, adds to the strand of studies analysing the level of CSR disclosure (Pistoni et al., 2018; Vitolla et al., 2020; Vitolla et al., 2020) and is innovative in that it considers an index directly featured for evaluating the alignment of the corporate NFD with the Directive 2014/95/EU requirements, thus allowing for comparison with other studies using a similar approach, but for different samples and/or time horizons. The prior literature suggests that the extent of NFD is low in the pre-implementation period (Dumitru et al., 2017) but increases (Matuszak & Różańska, 2021) in the post-implementation period. However, the use of key performance indicators (KPIs) in the context of the EU Directive is still limited

[1]Worldwide, the board structure has evolved into two main types: (i) a unitary (single) board structure that comprises both managers and independent directors providing advisory and monitoring functions, and (ii) a two-tier (dual) board structure comprising management board that manages the firm's operations, and a separate supervisory board charged with overseeing the firm's activities (Belot et al., 2014).

(Krasodomska & Zarzycka, 2021). Our analysis is consistent with these findings and adds nuanced evidence on the antecedents of NFD strategies by Polish two-tier boards in the period surrounding the Directive's implementation.

In addition, our research improves our understanding of the link between the internationalization of two-tier board structures and NFD in the institutional context of Central and Eastern European (CEE) countries. Recognizing that NFD depends on institutional and cultural settings (Kim et al., 2013), our research contributes to the literature on Western European countries (Gerged, 2021; Rao & Tilt, 2016), showing that mobile governance (Cumming et al., 2017) in particular, the IO earned in a different corporate governance model, may be useful for the move to a sustainable two-tier corporate governance model. The appointment of directors with IO to supervisory boards might help to overcome management resistance and provide information to the supervisory board (Adams & Ferreira, 2007), thereby leading to the development of more transparent NFD practices.

Although the Directive has been an important step in the path to sustainability for European companies (Albu et al., 2020), its implementation has been challenging, especially in CEE countries (Dumitru et al., 2017) whose reporting infrastructure remains weak (Albu et al., 2017). This article sheds some light on the scope of NFD by Polish companies at the time of the Directive's implementation.

Our research seemingly has several important implications. On a theoretical level, mobile governance and, more specifically, the presence of IO regarding the supervisory board may facilitate sustainable development. On a practical level, this study provides some guidelines to companies in relation to recruitment policies that encompass IO as a desired characteristic of potential supervisory board members. Additionally, regulators may gain some insights into how to shape policies related to board diversity.

The remainder of this article is organized as follows: the next section describes the institutional context of this study. This is followed by a presentation on the theoretical framework and hypotheses. We explain the research design in terms of the sample, measurement of variables, and model before presenting the results and their analysis. A discussion of the findings and conclusion is presented in the final section.

2 | INSTITUTIONAL BACKGROUND

Poland provides a rich opportunity to investigate the relationship between board IO and NFD for several reasons. On the one hand, Poland falls into a two-tier corporate governance model. The supervisory board consists solely of external (non-executive) directors, whereas the management board is composed of internal directors (Słomka-Gołębiowska & Urbanek, 2016).[2] Although Polish supervisory boards are the most important monitoring bodies, they have been blamed for playing a passive and reactive role and being more of ceremonial tools than substantial ones (Dobija, 2015). This recalls the characteristics of the broader Polish corporate governance system,[3] which is characterized by highly concentrated ownership and an inactive market for external control (Aluchna & Kaminski, 2017; Słomka-Gołębiowska & Urbanek, 2016). In the absence of a demanding capital market, it is especially important to provide incentives to the majority shareholders to be accountable toward various stakeholders and society at large.

On the other hand, as in other CEE countries, Poland has been subject to an increased need for accountability over time, and the NFD Directive has emerged as an important mechanism to achieve more transparent disclosure practices (Belal et al., 2013). However, Polish firms face greater difficulties when implementing new European or global accounting regulations (Dumitru et al., 2017) because of a still-deficient CEE financial reporting infrastructure, which is unable to fulfil the interests of all external users (Albu et al., 2017). Research documented that in the pre-implementation period of the Directive, Poland was characterized by a lower level of voluntary NFD relative to other EU countries (Matuszak & Różańska, 2021), and a significant variability exists in NFDs across different industries (Dyduch & Krasodomska, 2017). Poland also lagged behind other EU countries in terms of governmental efforts to integrate sustainability into national strategy documents (European Sustainable Development Network, 2011). At present, after the incorporation of the Directive to the national legislation, despite the emergence of some best practices, studies show that corporate NFD in Poland still needs improvement (Matuszak & Różańska, 2021). In such a setting, companies may import sustainable corporate governance and hire supervisory board members with IO to achieve better outcomes (Cumming et al., 2017) in relation to the development of sustainable strategies and related NFDs.

3 | THEORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

3.1 | Theoretical underpinnings

Two theories can be used to conceptualize the role of board IO regarding NFD. On the one hand, resource dependency theory (Salancik & Pfeffer, 1978) is useful for explaining the board's contribution to disclosures, especially those that are sustainability-related (Mallin & Michelon, 2011). It considers the board as a boundary spanner, securing a significant and appropriate mix of resources and competencies, which include different knowledge bases, experiences, and social capital to ensure firm survival (Hillman & Dalziel, 2003). The provision of diverse skills and experiences particularly increases the

[2]The management board is the real decision-making body responsible for formulating a strategy and for operations. The supervisory board exercises supervision in all areas of the company's activities, including granting of contracts to management board members, monitoring strategic and financial decisions, reviewing the firm's performance with the management board, approving annual reports, and selecting auditors.

[3]Corporate governance standards are imposed in the form of law and the Code of Best Practices provided by the Warsaw Stock Exchange (Dobija et al., 2022). The code includes recommendations for diversity policy in relation to gender, education, expertise, age, and experience for both the management and supervisory boards.

breadth and depth of human capital that the board draws to cope with external uncertainty. Therefore, it is an important driver of corporate performance (Haynes & Hillman, 2010). From this standpoint, diversity among directors' backgrounds and expertise results in a broader perspective and richer exchange of ideas, which allows in-depth conversations among directors and generates different alternatives (McDonald et al., 2008). Such diversity in the boardroom benefits the role directors play in monitoring and advising functions (Dass et al., 2014); additionally, it is associated with increased sustainability reporting (Beji et al., 2020).

On the other hand, upper echelons theory (Hambrick & Mason, 1984) can complement resource dependency theory by explaining why board IO can benefit NFD as a transparent disclosure practice globally required across all EU countries, especially for developing economies. Upper echelons research suggests that directors differ in terms of cognitive frames, thus affecting firms' decision-making and outcomes (Hambrick, 2007). According to this theory, values, cognitive models and aspects of personality are functions of observable characteristics such as prior education or experience (Finkelstein et al., 2008). Board members' international experiences shape their orientation, conceived as "a person's interwoven set of psychological and observable characteristics" (Finkelstein et al., 2008, p. 49). It is a source of superior managerial abilities in complex cross-border settings and also "leads to the development of a global mindset, allowing the board to think locally and act globally" (Piaskowska & Trojanowski, 2012, p.43).

Prior disclosure studies have pointed out that observable and unobservable managerial traits are reflected more strongly in settings with high managerial discretion, as is the case for NFD (Ge et al., 2011). Interestingly, in an NFD context, specific resources are needed to allow the board to influence broader sustainability corporate behaviours and increase stakeholder engagement (Beji et al., 2020). Given that NFD is part of the overall sustainability strategic posture, the disclosure of such information not only requires effective board monitoring but also calls for additional advice on the broader role of companies in society. Thus, importing sustainable corporate governance practices may prove to be a solution (Cumming et al., 2017), as supervisory board IO may push host firms in a weak institutional context to set up transparent NFD policies based on a more credible dialogue between the corporation and its various stakeholders (Åberg et al., 2019).

3.2 | The link between board IO and scope of NFD

A more recent discussion related to corporate governance from an international business perspective assumes that corporate governance structures and processes are becoming increasingly mobile internationally (Cumming et al., 2017), as companies can import and export corporate governance practices in the process of internationalization. A local firm may import governance practices by appointing, for instance, a foreign director on its board. Miletkov et al. (2017) suggest that the supply and demand for foreign directors are influenced by national demographics and the level of capital market development. Additionally, the institutional quality of the foreign directors' country of experience may affect company performance (Miletkov et al., 2017).

The presence of directors with IO can be analysed as a two-sided phenomenon. On the one hand, Masulis et al. (2012) and Hooghiemstra et al. (2019) suggest that board members with international experience may be less effective at monitoring because of cultural differences, language barriers, and less familiarity with local laws and regulations. On the other hand, the presence of foreign directors may increase the board's independence and hence make them better monitors (Hooghiemstra et al., 2019; Oxelheim & Randøy, 2003). Moreover, studies suggest that board IO may contribute to diverse opinions and perspectives, along with language, upbringing and life experience. Nielsen and Nielsen (2013) argue that nationality diversity offers not only broader international business knowledge and networks but also a different content and structure of cognitive schemas, thus influencing the way information is collected, processed, organized and used. These cognitive biases, coupled with the cultural values of the international expert's experience origin, create a filter through which information is selected and interpreted, which, in turn, provides the basis for the expert's decisions (Hambrick & Mason, 1984).

Therefore, it is likely that such experts may show more openness and frankness when performing their monitoring tasks (Oxelheim & Randøy, 2003). They are also more likely to exhibit independent thinking and feel less reluctant to raise controversial issues because of the board's lower cohesiveness (Forbes & Milliken, 1999). This may benefit board discussions and potentially contribute to increased board task effectiveness (Miletkov et al., 2017). Recent studies also confirm the positive role of board IO, documenting that it may improve financial reporting practices (Hooghiemstra et al., 2019), especially in the context of Anglo-American corporate governance.

In this study, we embrace the view that directors with IO, that is, foreign directors and/or directors with experience in a foreign country, can provide supervisory boards with their unique knowledge and skills as well as an enlarged cultural perspective needed to monitor managerial decisions with better authority in relation to the non-financial reporting process. Directors with IO are more likely to impose stronger monitoring practices on management (Giannetti et al., 2015) and reduce managerial myopia (Zhang et al., 2018), directing the company's attention to the long-term perspective as well as the interests of various stakeholders (Harjoto et al., 2018).

Meanwhile, as the NFD policy is part of the overall sustainable corporate strategy discussed and approved by the board, the IO of the supervisory board, as ensured by foreign directors and/or with experience in a foreign country, may favour its advisory role by placing greater emphasis on sustainability behaviours at the upper echelon levels (Harjoto et al., 2015; Katmon et al., 2019; Muttakin et al., 2018). Directors with IO bring the benefits of the experience developed in other firms and managerial practices from other countries to the board debate about the sustainability strategic posture. They are more likely to be affected by the view of CSR as a social

norm (Zhang et al., 2018), thus ensuring greater commitment to stakeholders and increased accountability for non-financial aspects (Harjoto et al., 2018; Khan et al., 2013). By introducing a global mindset, they can also enhance the board's ability to reach international standards (Harjoto et al., 2015) and ease the institutionalization of global best practices on sustainability by the local firm (Miletkov et al., 2017; Piaskowska & Trojanowski, 2012).

In summary, we expect that the variety of views and alternative perspectives of directors with IO will enable the transfer of effective sustainable business strategies acquired and observed abroad and will provide the supervisory board of host firms with either better monitoring of the non-financial reporting process or advising about what, how, and when non-financial outcomes can be reported to the public, thus increasing the scope of NFD.

Accordingly, this line of reasoning suggests the following hypothesis:

Hypothesis 1. *The IO of the supervisory board is positively associated with the NFD scope.*

3.3 | The role of the diversity among directors with IO

We recognize that directors with IO are not a homogenous group and substantial diversity exists in boards (Hafsi & Turgut, 2013), arising from not only a variety of international experiences but also other concurrent directors' characteristics (Hillman & Dalziel, 2003). In this study, we exploit the diversity among directors with IO in terms of gender, accounting and finance experience, and country of international experience, given the relevance of these characteristics in shaping the board's overall human capital (Johnson et al., 2013) and their potential to explain individual directors' preferences in relation to NFD.

3.3.1 | The gender

Female directors bring different characteristics that increase the supervisory board's capability to monitor and advice. From the perspective of resource dependency theory, they exhibit superior networking skills to the benefit of the board's ability to reduce dependence on the external environment (Nadeem et al., 2020). They have different knowledge, experiences and values than their male peers, which leads to improved board oversight, enhanced transparency and reduced information asymmetry (Dobija et al., 2022).

Another reason for the positive influence of women on boards on NFD may be that they bring different human and social capital initiatives to boards because of their different educational and professional backgrounds (Bear et al., 2010). Women are more than twice as likely as men to hold doctoral degrees, gain board experience with smaller firms, and are less likely to have been appointed in leadership positions. Contrary to males, female directors are found to be less focused on economic matters and more on charity actions and community involvement, thus allowing companies to have a better image with regard to stakeholders (Pucheta-Martínez & Gallego-Álvarez, 2018).

Women on corporate boards also tend to identify with a broader group of individuals (García-Sánchez et al., 2019) and their superior social and environmental orientation is likely to influence other directors to become more engaged with CSR (Pucheta-Martínez et al., 2021; Pucheta-Martínez & Gallego-Álvarez, 2018; Rao & Tilt, 2016). Gender diversity may help ensure that alternative perspectives and issues are considered in the decision-making process, and it may also inform stakeholders that the firm pays attention to sustainability issues (De Masi et al., 2021). Thus, it can be assumed that female directors with IO are more prone to facing stakeholder pressures through increased NFD.

Hypothesis 2. *The presence of female directors with IO on supervisory boards is positively associated with NFD scope.*

3.3.2 | The accounting and finance expertise

Accounting and finance expertise are seemingly considered necessary when monitoring financial reporting (Bédard & Gendron, 2010). At the same time, the link between accounting and finance expertise and NFD remains unclear. Helfaya and Moussa (2017) document that directors with accounting and financial expertise are likely to maintain a balance between a company's financial and nonfinancial goals and address stakeholders' concerns. Similarly, accounting and financial experience increases board monitoring and advising abilities, thus enhancing NFD (Lewis et al., 2014; Pucheta-Martínez et al., 2021). Therefore, it is likely that accounting and finance experts with IO may be keen to challenge company management by encouraging companies to publish relevant financial and nonfinancial information to stakeholders.

Nevertheless, the attitude of the accountancy profession toward NFD (e.g., Lodhia, 2003) and the implementation of the Directive (Krasodomska et al., 2020) does not seem to be very supportive. Accountants see themselves as "number crunchers" and bookkeepers and consider NFD as lying outside their competencies and interests. In line with this claim, it has been suggested that business education may lower the need to consider stakeholder needs to engage in sustainability (Godos-Díez et al., 2015). Therefore, accounting and finance experience may constrain NFD, especially when perceived as less reliable and costlier to produce, by setting a high priority on financial information.

Accounting and finance experts with IO may bring a broader view regarding the need for disclosures beyond financial ones, thus increasing the scope of NFD. However, it is also possible that their accounting and finance backgrounds restrict their monitoring of financial reporting. Therefore, we posit the following non-directional hypothesis:

Hypothesis 3. *The presence of accounting and finance experts with IO on the supervisory board is associated with NFD scope.*

3.3.3 | The role of country of international experience

International comparative studies suggest that political, social, institutional and cultural factors influence disclosure agendas (Jamali et al., 2020; Obara & Peattie, 2018). The concerns of various stakeholders, such as regulators, shareholders, creditors, media and pressure groups, seem to be the driving forces for NFD in developed economies. In the case of developing countries, the call for NFD comes from powerful stakeholders (Khan et al., 2013). However, there are substantial differences in the NFD agenda within developed economies (Matten & Moon, 2008). For instance, Matten and Moon (2008) suggest that US companies tend to be more explicit in the way they address societal needs, whereas European companies make more implicit references to the role of companies in society. Not surprisingly, early studies on voluntary NFD focus on the Anglo-American context rather than continental Europe (Fifka, 2013). However, there has been increasing interest among EU member states for NFD, especially in the aftermath of the EU Directive agenda, and a great variety of practices remain in place (Mio et al., 2021). The so-called "new member countries" consider NFD as a foreign practice forced upon by the EU and face several obstacles to the effective implementation of the new regulations (Dumitru et al., 2017). Additionally, despite the need to adhere to the EU regulatory framework, the enforcement mechanisms in place are inefficient (Albu et al., 2020).

Therefore, we maintain that directors with prior international experience acquired in Anglo-American countries with explicit reference to CSR and much longer experience in relation to NFD may impact the scope of the information disclosed by the local firm. It is likely that such directors regard CSR as a social norm (Zhang et al., 2018) and are more conscious of the need for accountability (Harjoto et al., 2018), thus pushing for an explicit approach toward NFD. Consequently, they will be more inclined to advice on the development of strategies in relation to such disclosures and simultaneously push for the better monitoring of non-financial information and disclosures. Therefore, we propose the following hypothesis:

> **Hypothesis 4.** *The presence of directors with IO gained in Anglo-Saxon countries on supervisory boards is positively associated with NFD scope.*

4 | RESEARCH DESIGN

4.1 | Research sample

To test our hypotheses, we employ a sample of non-financial companies listed on the WSE[4] for the period from 2014 to 2018, surrounding the publication of the Directive and its implementation in national legislation for Poland-based firms. This timespan has been selected to have a balanced distribution of years between the pre- and post-implementation periods. We started with the entire sample of listed firms in 2014 and randomly selected 100 companies. The data are retrieved from Reuters and Bloomberg and supplemented with Notoria Service, one of the most comprehensive databases for information on companies listed on the WSE.[5] In the case of missing information, Internet sources, such as LinkedIn and corporate websites, are also checked. Initially, we employ 500 company-year observations. Owing to missing data for our variables and the inclusion of the lagged regressor in the GMM estimations, the running sample covers 98 firms for 4 years (i.e., 392 firm-year observations).

4.2 | Main model specification

To examine the impact of board IO on NFD, we rely on the GMM multivariate regression analysis with the GMM-SYS estimator proposed by Blundell and Bond (1998), following recent studies on corporate governance (Alkalbani et al., 2019). In contrast to static panel estimators, such as random or fixed effects models, GMM-SYS allows for controlling for potential endogeneity or limited (sequential) exogeneity of variables. In our situation, these phenomena automatically occur while controlling for time persistence in a company's disclosure by incorporating the lagged dependent variable among our regressors. Thus, while specifying the instruments for our regression models, we treat the lagged dependent variable as only sequentially exogenous.

This approach results in a model with a general form, represented by Equation (1):

$$\mathrm{NFDI}_{j,t} = f\left(\mathrm{NFDI}_{j,t-1}; \mathrm{DIO}_{,t-1}; \mathrm{Controls}_{j,t}\right) \quad (1)$$

where j denotes the company and t represents the year.

Our dependent variable for all model specifications is the NFD index (NFDI), based on the new reporting requirement in the Directive. The regressors consist of (1) a vector of lagged dependent variables ($\mathrm{NFDI}_{j,t-1}$), (2) directors with IO and their characteristics ($\mathrm{DIO}_{,t-1}$), and (3) a vector of control variables ($\mathrm{Controls}_{j,t}$), as presented in Table 1, with their full definitions and data sources.

In all our GMM-SYS estimations, the appropriateness of the set of instruments is formally evaluated using the Hansen test.

4.3 | Variable

4.3.1 | Dependent variable

We measure the dependent variable (NFDI), namely, the scope of NFD, using the disclosure index based on a manual content analysis.

[4]Under the Directive, the Polish public interest entities with over 500 employees, a net turnover over EUR 40 million, or a balance sheet total over EUR 20 million should provide NFD using an international, national, or EU-based reporting framework, or a mixed reporting methodology constituted by one or more reporting standards. Such firms must provide NFD in the management report, or as a separate report published alongside the management report, or within 6 months of the balance sheet date made available on the corporate website. It must also be referenced in the management report.

[5]Notoria Service is a WSE-listed company that sells financial information, including on stock prices of companies listed on the WSE, and provides tools for financial data analysis.

TABLE 1 Variables definitions

Variable name	Variable description	Data source	Adapted from
Dependent variable			
NFDI_TOT	Total non-financial disclosure index	Hand-collection from corporate reports	Dumitru et al. (2017)
NFDI_BUSIN	Non-financial disclosure index related to business operations: information on employee matters, which we consider as actions taken to ensure gender equality, implementation of fundamental conventions of The International Labour Organization, working conditions, respect for the right of workers to be informed and consulted, and health and safety at work.	Hand-collection from corporate reports	Dumitru et al. (2017)
NFDI_ENVIR	Non-financial disclosure index related to the environmental matters: information on environmental issues, which is defined as a company's impacts on the environment, health, and safety, as well as its use of renewable and non-renewable energy, greenhouse gas emissions, water use and air pollution.	Hand-collection from corporate reports	Dumitru et al. (2017)
NFDI_SOC	Non-financial disclosure index related to social matters: information on social matters, such as respect for trade union rights, dialog with local communities, and actions taken to ensure the protection and development of local communities.	Hand-collection from corporate reports	Dumitru et al. (2017)
NFDI_ETH	Non-financial disclosure index related to ethics: information on respect for human rights, anti-corruption and bribery matters.	Hand-collection from corporate reports	Dumitru et al. (2017)
Independent variables			
DIO_P	Share of foreign directors with international orientation (foreign or Polish-born with at least 5 years of international experience) on board	Hand collection from corporate reports	Piaskowska and Trojanowski (2012); Beji et al. (2020)
DIO_GENDER	Share of women directors with international experience on board	Hand collection from corporate reports	Bear et al. (2010); Rao and Tilt (2016); Beji et al. (2020)
DIO_ACCOUNTANT	Dummy equals 1 if the number of directors with international experience having financial and accounting background is greater than the 30%	Hand collection from corporate reports	McDaniel et al. (2002)
DIO_ANGLO_SAXON	Dummy variable equals one if there is at least one director with experience abroad in Anglo-Saxon countries	Hand collection from corporate reports	Matten and Moon (2008)
Control variables			
BOARD_SIZE	Number of directors sitting on the board	Reuters/Notoria	Jizi et al. (2014), Ntim and Soobaroyen (2013)
BOARD_MEETINGS	Number of times the board meets in 1 year	Reuters/Notoria	Al-Shaer and Zaman (2016); Jizi et al. (2014)
INDEP_BOARD	Share of independent directors in total board size	Reuters/Notoria	Harjoto and Jo (2011)
REPORT_INCENTIVE	Reporting incentive factor; a single factor reflects the strength of a firm's reporting incentives from various characteristics (firm size, leverage, return on assets, % of shares held by the biggest investor, and % of shares held by foreign investors).	Reuters/Notoria	Daske et al. (2013)

TABLE 1 (Continued)

Variable name	Variable description	Data source	Adapted from
REPORT_BEHAVIOR	Reporting behaviour factor equals the absolute value of accruals scaled by the absolute value of cash flows from operations	Notoria Service	Daske et al. (2013)
REPORT_ENVIR	Dummy variable of value 1 when a company is included on respect index, zero overwise.	Notoria Service	Daske et al. (2013)
SENSITIVE_SECTORS	Dummy variable of value 1 if the firm operates in a sensitive sector; 0 otherwise.	Reuters/Notoria	Muttakin and Subramaniam (2015)

This approach has been found to be more informative in previous studies (Dumitru et al., 2017; Pistoni et al., 2018; Vitolla et al., 2020; Vitolla et al., 2020). Following Cormier et al. (2005), we assigned the following scores: 0, no presentation; 1, narrative presentation; 2, presentation using key performance indicators or other numerical/quantitative data; and 3 (1 + 2), narrative and numerical presentation simultaneously. The maximum overall number of points for one company is 60, corresponding to a mix (narrative plus quantitative presentations) of all the items in this study (see the example of coding in Appendix).[6]

We determine the items to be included in the index based on the Directive. Following Dumitru et al. (2017) approach, we exclude two items in the Directive from the list, specifically, the outcome of policies and social dialog, because the other items cover these aspects (Appendix).

We divide NFDI into four categories: business (NFDI_BUSIN), environment (NFDI_ENVIR), society (NFDI_SOC), and ethics (NFDI_ETH). Thus, we separately compute the score for the four different NFD themes (NFDI_BUSIN, NFDI_ENVIR, NFDI_SOC and NFDI_ETH) as well as the overall NFD scope (NFDI_TOT) as a percentage, with a maximum disclosure score of 100%. The definitions of all the variables are presented in Table 1.

4.3.2 | Independent variables

Our main independent variable is the supervisory board IO. Following Piaskowska and Trojanowski (2012), we identify the IO of board members in the presence of a foreigner with business experience outside Poland or a Polish national with at least 5 years of international experience in managerial positions, and similar to Beji et al. (2020), we compute a continuous variable measuring the percentage of directors with IO (DIO_P).

In this study, the diversity among directors with IO is captured through different attributes. In particular, we choose gender (DIO_GENDER), following the suggestion that women are considered more socially and environmentally oriented (Bear et al., 2010; Rao & Tilt, 2016). We focus on accounting and finance expertise (DIO_ACCOUNTANT) as opposed to just the literacy of board members, as having accounting and finance expertise may encourage companies to focus more on disclosures and their scope (McDaniel et al., 2002). Finally, we consider experience in Anglo-Saxon countries (DIO_ANGLO_SAXON), assuming that a more explicit attitude in relation to NFD gained through international experience in these countries may shape the DIO's monitoring and advising ability on NFD (Matten & Moon, 2008).

To avoid model misspecifications, we also control for additional variables that might affect the scope of NFDs. Following the literature (e.g., Harjoto & Jo, 2011; Jizi et al., 2014; Ntim & Soobaroyen, 2013), we include controls for three other board characteristics: board size (BOARD_SIZE), frequency of meetings (BOARD_MEETINGS), and board independence (INDEP_BOARD).

We follow Daske et al. (2013) and Al-Shaer and Zaman (2016) and construct three proxies to identify the factors that determine other underlying reporting motivations (REPORT_INCENTIVE, REPORT_BEHAVIOR, and REPORT_ENVIR; see Table 1). Finally, we use a dummy variable (SENSITIVE_SECTORS) to control for sensitive sectors.

5 | RESULTS AND ANALYSIS

5.1 | Descriptive statistics

Table 2 presents the mean, *SE*, and minimum and maximum values of the main variables.

The results show that the sample companies report little information on NFD, with an average index (NFDI_TOT) of 29.07%, reaching a maximum value of 89.29%. This can be easily explained by the fact that the NFD issue in Poland is new for most companies listed on the WSE (Krasodomska & Zarzycka, 2021). Further analysis of the different categories seemingly suggests that the largest NFD amount is provided on average for business information (NFDI_BUSIN = 36.73%), followed by ethical issues (NFDI_ETH = 28.06%), whereas the lowest value is shown by the provision of social information (NFDI_SOC = 23.06%). The disclosure index reflecting the scope of environmental information is present in the mid-range (NFDI_ENVIR = 27.78%) with a high degree of variability. These findings are mostly in line with Dumitru et al. (2017)

[6]To assess whether our index represents a reliable measure of NFD, we check the external validity of our measure by analysing its correlation with a publicly available measure. For this purpose, we choose Refinitiv's ESG Score, that has been used as a proxy for CSR disclosure (Arayssi et al., 2020). Due to the limited coverage of this database for Polish firms, only 42 cases with non-missing data were identified. Results of this analysis reveals that there is a positive, high, and statistically significant (<1%) correlation between NFDI and the ESG score (0.424), confirming that our coding has been conducted in a proper way and represents a reliable measure of NFD.

TABLE 2 Descriptive statistics

Variable	Obs.	Firms	Mean	*SD*	Min	1st Q	2nd Q	3rd Q	Max
NFDI_TOT	392	98	29.066	25.541	0.000	7.293	16.665	52.418	89.288
NFDI_BUSIN	392	98	36.735	21.276	0.000	25.000	33.330	50.000	100.000
NFDI_ENVIR	392	98	27.781	30.609	0.000	0.000	16.670	57.140	100.000
NFDI_SOC	392	98	23.661	22.316	0.000	0.000	16.670	41.670	75.000
NFDI_ETH	392	98	28.061	39.899	0.000	0.000	0.000	33.330	100.000
DIO_P	392	98	0.215	0.278	0.000	0.000	0.000	0.400	1.000
DIO_GENDER	392	98	0.012	0.044	0.000	0.000	0.000	0.000	0.286
DIO_ACCOUNTANT	392	98	0.097	0.296	0.000	0.000	0.000	0.000	1.000
DIO_ANGLO_SAXON	392	98	0.423	0.495	0.000	0.000	0.000	1.000	1.000
BOARD_SIZE	392	98	6.416	1.611	5.000	5.000	6.000	7.000	15.000
BOARD_MEETINGS	392	98	6.217	3.529	1.000	4.000	5.000	8.000	28.000
INDEP_BOARD	392	98	0.569	0.293	0.000	0.333	0.600	0.800	1.000
REPORT_INCENTIVE	392	98	0.034	0.997	−2.571	−0.730	0.085	0.687	2.848
REPORT_BEHAVIOR	392	98	−0.035	0.124	−0.483	−0.079	−0.039	−0.001	1.243
REPORT_ENVIR	392	98	0.153	0.361	0.000	0.000	0.000	0.000	1.000
SENSITIVE_SECTORS	392	98	0.429	0.496	0.000	0.000	0.000	1.000	1.000

Note: All variables are defined in Table 1.

study on the implementation of the Directive in Poland and Romania in 2014.

Regarding board composition, we observe that on average, approximately 20% of the directors on the supervisory board of Polish firms have IO (DIO_P = 0.215). Although there is a decent representation of directors with international experience in Anglo-Saxon countries, their diversity in terms of gender and accounting expertise is very limited. This picture particularly suggests that in the case of Poland, the average number of female directors with IO on supervisory boards is below the critical mass needed to impact financial reporting (i.e., between 20% and 40%; see Dobija et al., 2022).

Regarding board structure and functioning, we observe that the average number of supervisory board members is six, in line with the numbers already reported in prior studies (Dobija et al., 2022). Given the two-tier board structure, where the management board is separated from the supervisory board (Aluchna & Kaminski, 2017), it is unsurprising that the supervisory boards in Poland are rather small institutions. Supervisory boards meet six times per year on average, with some rare cases of very active boards mainly due to investor activism. The maximum number of supervisory board meetings is 28. Half of the supervisory board members are independent board members. These results are consistent with those of previous studies (Dobija et al., 2022; Słomka-Gołębiowska & Urbanek, 2016).

The factor analysis used to identify the strength of a firm's reporting incentive (REPORT_INCENTIVE) shows that relatively larger and less profitable firms have higher reporting incentives. Additionally, firms with a higher share of foreign capital and the largest investors (REPORT_BEHAVIOR) have more incentives to disclose information. Less than half of the sample firms (43%) operate in a sensitive sector.

Table 3 presents the Pearson correlation matrix to test for multicollinearity. The correlation between most pairs is low, generally below 0.5. None of the correlation coefficients of the company and board characteristics are sufficiently high (>0.80) to cause multicollinearity problems (Archambeault & DeZoort, 2001). A high correlation is observed only for NFDI and its four disclosure themes.

5.2 | Main results

Table 4 presents the regression results for the relationship between the IO of supervisory boards and NFD scope.

Column 1 of Table 4 shows a positive and significant association between DIO_P and NFDI_TOT (b = 4.741, $p < 0.10$). This result indicates that the appointment of directors with IO on supervisory boards increases the scope of NFDs and provides general support for H1.

Columns 2–5 of Table 4 report the results of the analysis of the different NFD categories. The positive influence of directors with IO on NFD is particularly accentuated in the case of disclosure on societal issues ($b = 7430$, p-value <0.01). The latter result can be explained by the argument that board members with IO have a greater awareness of the role of companies in society (Åberg et al., 2019) and thus are particularly able to boost board stakeholder orientation via enhanced information.

Our analysis suggests that, in the case of Polish firms, the size of the supervisory board is unrelated to the NFD scope. This result might be attributable to the fact that in the dual-board model, the supervisory board tends to be rather small compared to the settings in other studies (Dobija et al., 2022). Similarly, we find that the diligence of the board, measured by the number of board meetings, does not influence the scope of NFDs.

TABLE 3 Correlation analysis

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	NFDI_TOT	1	0.817***	0.911***	0.907***	0.918***	0.179***	0.261***	0.223***	−0.008	0.264***	0.173***	−0.031	0.023	0.066	−0.006	0.056
2	NFDI_BUSIN		1	0.672***	0.693***	0.656***	0.138***	0.156***	0.15***	0.027	0.151***	0.155***	0.02	0.039	0	0.069	0.041
3	NFDI_ENVIR			1	0.82***	0.748***	0.175***	0.258***	0.229***	−0.048	0.271***	0.229***	−0.024	−0.005	0.091*	−0.063	0.028
4	NFDI_SOC				1	0.764***	0.184***	0.229***	0.195***	−0.022	0.285***	0.151***	−0.042	0.06	0.106**	0.041	0.083*
5	NFDI_ETH					1	0.147***	0.259***	0.205***	0.014	0.228***	0.102**	−0.048	0.006	0.04	−0.029	0.053
6	BOARD_SIZE						1	0.248***	0.412***	−0.132***	0.374***	−0.051	−0.286***	0.174***	0.196***	0.231***	0.135***
7	BOARD_MEETINGS							1	0.186	−0.09*	0.384***	0.13**	−0.172***	−0.126**	−0.118**	−0.018	−0.092*
8	REPORT_INCENTIVE								1	−0.188***	0.219***	0.012	***-0.293	0.324***	0.128**	0.218***	0.265***
9	REPORT_BEHAVIOR									1	−0.118**	−0.03	0.099**	0.027	−0.019	0.06	0.001
10	REPORT_ENVIR										1	0.104**	−0.143***	0.008	0.045	−0.02	−0.02
11	SENSITIVE_SECTORS											1	−0.112***	−0.144***	−0.11**	−0.179***	−0.085*
12	INDEP_BOARD												1	−0.101**	−0.146***	−0.039	−0.086*
13	DIO_P													1	0.371***	0.579***	0.76***
14	DIO_GENDER														1	0.095*	0.326***
15	DIO_ACCOUNTANT															1	0.33***
16	DIO_ANGLO_SAXON																1

Note: This table presents a correlation matrix among dependent, independent and control variables. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

TABLE 4 Directors' international orientation and NFDI.

Variables	(1) NFDI_TOT	(2) NFDI_BUSIN	(3) NFDI_ENVIR	(4) NFDI_SOC	(5) NFDI_ETH
DIO_P	4.741*	3.228	5.365	7.430***	3.524
	(2.676)	(3.131)	(4.305)	(2.866)	(5.511)
BOARD_SIZE	−0.227	0.485	−0.457	−0.0685	−0.521
	(0.659)	(0.993)	(0.854)	(0.520)	(0.995)
BOARD_MEETINGS	0.390	0.208	0.566	0.428*	0.529
	(0.260)	(0.291)	(0.370)	(0.236)	(0.452)
INDEP_BOARD	0.711	1.792	2.670	0.730	−2.551
	(2.775)	(3.537)	(4.452)	(2.122)	(3.956)
REPORT_INCENTIVE	2.189**	1.859*	2.864***	0.533	3.432**
	(0.883)	(0.956)	(1.041)	(0.784)	(1.639)
REPORT_BEHAVIOR	6.295	13.63***	2.801	−0.856	10.58
	(4.866)	(4.544)	(6.623)	(3.452)	(8.362)
REPORT_ENVIR	1.575	0.814	2.446	0.656	4.331
	(2.398)	(2.213)	(3.799)	(2.118)	(4.119)
SENSITIVE_SECTORS	3.132**	3.350**	5.263**	2.439*	2.869
	(1.528)	(1.486)	(2.309)	(1.359)	(2.552)
L.NFDI_TOT	0.800***				
	(0.0634)				
L.NFDI_BUSIN		0.678***			
		(0.0649)			
L.NFDI_ENVIR			0.742***		
			(0.0596)		
L.NFDI_SOC				0.791***	
				(0.0613)	
L.NFDI_ETH					0.767***
					(0.0571)
Year dummies	YES	YES	YES	YES	YES
Constant	0.498	−0.0747	0.306	0.145	1.206
	(4.851)	(7.334)	(7.154)	(4.067)	(7.261)
Observations	392	392	392	392	392
Number of FIRM_ID	98	98	98	98	98
AR(1)	−7.081***	−5.783***	−5.350***	−6.228***	−6.991***
AR(2)	0.641	0.991	−0.0219	0.105	1.783*
Hansen	11.21	10.11**	11.43	7.090	8.408

Note: This table presents the results of the GMM-SYS estimations to test H[1] obtained running Equation (1) and using DIO as a measure for the directors' IO. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

Our results also show that, among the variables traditionally associated with the scope of NFD, the incentives related to firm-specific factors (i.e., size, leverage, profitability and ownership) count the most, while the reporting behaviour proxied by the scope of financial reporting is positively related to the scope of non-financial business-related information. Finally, in line with the well-established literature on the variation in CSR reporting across sensitive and non-sensitive industries (Liu & Anbumozhi, 2009), our results confirm that Polish companies operating in sectors generally characterized by high negative environmental impacts and high capital intensity provide more NFDs to lessen the societal concerns emerging from the controversial nature of their activity.

Tables 5–7 report results of the analysis testing the role of diversity among directors with IO.

Column 1 of Table 5 shows that DIO_GENDER is significantly and positively related to NFDI_TOT ($b = 48.35$, $p < 0.01$). Upon considering the results for the NFDI sub-components (Table 5, Columns 2–4), we find that the presence of women with experience abroad

TABLE 5 The gender of directors with international orientation and NFDI.

Variables	(1) NFDI_TOT	(2) NFDI_BUSIN	(3) NFDI_ENVIR	(4) NFDI_SOC	(5) NFDI_ETH
DIO_GENDER	48.35***	35.39*	73.86***	47.90***	37.86
	(13.64)	(21.28)	(25.41)	(14.60)	(27.81)
BOARD_SIZE	−0.363	0.374	−0.680	−0.180	−0.653
	(0.632)	(0.949)	(0.803)	(0.512)	(0.985)
BOARD_MEETINGS	0.426	0.229	0.640*	0.433*	0.576
	(0.262)	(0.284)	(0.377)	(0.237)	(0.449)
INDEP_BOARD	1.146	2.050	3.412	1.076	−2.166
	(2.789)	(3.550)	(4.418)	(2.191)	(4.034)
REPORT_INCENTIVE	2.443***	2.030**	3.109***	0.996	3.617**
	(0.852)	(0.928)	(1.003)	(0.720)	(1.612)
REPORT_BEHAVIOR	6.924	14.12***	3.497	0.134	11.03
	(4.791)	(4.600)	(6.553)	(3.653)	(8.166)
REPORT_ENVIR	1.491	0.702	2.429	0.470	4.255
	(2.542)	(2.278)	(3.994)	(2.314)	(4.203)
SENSITIVE_SECTORS	3.227**	3.398**	5.622**	2.297*	2.943
	(1.545)	(1.544)	(2.255)	(1.384)	(2.608)
L.NFDI_TOT	0.795***				
	(0.0640)				
L.NFDI_BUSIN		0.682***			
		(0.0646)			
L.NFDI_ENVIR			0.731***		
			(0.0605)		
L.NFDI_SOC				0.793***	
				(0.0623)	
L.NFDI_ETH					0.762***
					(0.0569)
Year dummies	Yes	Yes	Yes	Yes	Yes
Constant	1.450	0.583	1.159	1.894	1.917
	(4.756)	(7.355)	(6.934)	(4.018)	(7.210)
Observations	392	392	392	392	392
Number of FIRM_ID	98	98	98	98	98
AR(1)	−7.065***	−5.833***	−5.199***	−6.300***	−7.040***
AR(2)	0.702	0.952	−0.0343	0.0983	1.903*
Hansen	9.677	10.07**	11.52	6.417	7.584

Note: This table presents the results of the GMM-SYS estimations to test H[2] obtained running Equation (1) and using DIO_GENDER as measure of DIO. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

increases the scope of non-financial information provided on the business ($b = 35.39$, $p < 0.10$), environment ($b = 73.86$, $p < 0.01$), and society ($b = 47.90$, $p < 0.01$). This result provides strong support for our H2, suggesting that the gender of DIO is the most important factor explaining the director's preferences toward NFD thanks to their greater sensitivity toward societal and environmental issues.

Table 6 reports results for the accounting and finance expertise of DIO.

The findings from Column 4 reveal that DIO_ACCOUNTANT is negatively and significantly related to NFDI_ENVIR ($b = -8.472$, $p < 0.05$). This evidence partially confirms H3, suggesting that accounting and finance experts with IO tend to focus more on financial reporting, devoting limited monitoring and counsel to the NFD process, especially concerning the provision of information about the environment.

Finally, Table 7 reports results for the country of origin of DIO.

In particular, the presence of directors with international experience in one of the Anglo-Saxon countries (DIO_ANGLO_SAXON) is positively and significantly related to the scope of NFDs on societal issues ($b = 3.958$, $p < 0.05$). This result provides some support for H4,

TABLE 6 The accounting and finance experience of directors with international orientation and NFDI.

Variables	(1) NFDI_TOT	(2) NFDI_BUSIN	(3) NFDI_ENVIR	(4) NFDI_SOC	(5) NFDI_ETH
DIO_ACCOUNTANT	−3.649	−0.153	−8.472**	−1.510	−4.943
	(2.834)	(4.651)	(3.393)	(2.671)	(5.662)
BOARD_SIZE	−0.0745	0.523	−0.140	0.0541	−0.343
	(0.711)	(1.085)	(0.932)	(0.538)	(1.020)
BOARD_MEETINGS	0.342	0.174	0.508	0.348	0.504
	(0.257)	(0.284)	(0.371)	(0.230)	(0.428)
INDEP_BOARD	0.567	1.717	2.636	0.568	−2.657
	(2.785)	(3.535)	(4.431)	(2.175)	(3.954)
REPORT_INCENTIVE	2.720***	2.128**	3.644***	1.153	3.965***
	(0.833)	(0.924)	(1.025)	(0.710)	(1.512)
REPORT_BEHAVIOR	7.462	14.11***	4.750	0.331	11.89
	(4.936)	(4.535)	(6.799)	(3.717)	(8.359)
REPORT_ENVIR	1.229	0.750	1.768	0.135	4.024
	(2.428)	(2.323)	(3.855)	(2.292)	(4.091)
SENSITIVE_SECTORS	2.378	3.072**	3.957*	1.629	2.152
	(1.561)	(1.518)	(2.221)	(1.382)	(2.551)
L.NFDI_TOT	0.808***				
	(0.0630)				
L.NFDI_BUSIN		0.685***			
		(0.0652)			
L.NFDI_ENVIR			0.752***		
			(0.0572)		
L.NFDI_SOC				0.819***	
				(0.0602)	
L.NFDI_ETH					0.761***
					(0.0581)
Year dummies	YES	YES	YES	YES	YES
Constant	1.744	0.707	1.458	2.172	2.069
	(4.915)	(7.550)	(7.142)	(4.056)	(7.161)
Observations	392	392	392	392	392
Number of FIRM_ID	98	98	98	98	98
AR(1)	−7.116***	−5.814***	−5.397***	−6.362***	−7.155***
AR(2)	0.836	0.997	0.104	0.110	1.977**
Hansen	10.22	10.15**	11.05	6.560	8.918

Note: This table presents the results of the GMM-SYS estimations to test H[3] obtained running Equation (1) and using DIO_ACCOUNTANT as measure of DIO. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

suggesting that exposure to the Anglo-American environment increases the monitoring and advising resources of directors with IO thanks to the explicit exposure to CSR as a societal norm and the acquired experience in relation to the disclosure of non-financial information.[7]

[7]Additionally, we investigated a simultaneous effect of the different IO variables by running a model with both the share of international experts and of international experts that are female/with accounting and finance experience/from Anglo-Saxon countries. Untabulated outcomes generally corroborate our main findings.

5.3 | Robustness check

5.3.1 | Cluster analysis

To gain deeper insights into the diversity of board IO and its relationship with NFD in the context of Polish firms, we divide our firm-year observations into clusters. Namely, we run k-medoid clustering to distinguish three clusters driven by the

TABLE 7 The country of experience of directors with international orientation and NFDI.

Variables	(26) NFDI_TOT	(28) NFDI_BUSIN	(30) NFDI_ENVIR	(32) NFDI_SOC	(34) NFDI_ETH
DIO_ANGLO_SAXON	2.650	1.082	1.366	3.958**	4.372
	(1.704)	(1.999)	(2.403)	(1.595)	(3.103)
BOARD_SIZE	−0.244	0.493	−0.449	−0.0850	−0.595
	(0.666)	(0.999)	(0.863)	(0.532)	(0.980)
BOARD_MEETINGS	0.385	0.191	0.536	0.414*	0.567
	(0.259)	(0.292)	(0.364)	(0.232)	(0.449)
INDEP_BOARD	0.695	1.763	2.576	0.699	−2.466
	(2.789)	(3.564)	(4.475)	(2.135)	(3.934)
REPORT_INCENTIVE	2.271**	1.995**	3.150***	0.684	3.217*
	(0.900)	(0.969)	(1.040)	(0.736)	(1.722)
REPORT_BEHAVIOR	6.542	13.93***	3.275	−0.335	10.45
	(4.902)	(4.619)	(6.673)	(3.587)	(8.373)
REPORT_ENVIR	1.747	0.851	2.478	0.895	4.654
	(2.379)	(2.218)	(3.776)	(2.094)	(4.111)
SENSITIVE_SECTORS	2.972*	3.174**	4.938**	2.165	2.917
	(1.524)	(1.496)	(2.240)	(1.369)	(2.579)
L.NFDI_TOT	0.798***				
	(0.0629)				
L.NFDI_BUSIN		0.682***			
		(0.0660)			
L.NFDI_ENVIR			0.744***		
			(0.0594)		
L.NFDI_SOC				0.791***	
				(0.0608)	
L.NFDI_ETH					0.763***
					(0.0562)
Year dummies	YES	YES	YES	YES	YES
Constant	0.611	0.261	1.277	0.388	0.137
	(5.126)	(7.575)	(7.464)	(4.339)	(7.674)
Observations	392	392	392	392	392
Number of FIRM_ID	98	98	98	98	98
AR1	−6.991***	−5.810***	−5.338***	−6.236***	−6.998***
AR2	0.668	1.006	−0.0321	0.230	1.764*
Hansen	11.81	10.19**	11.46	6.659	7.992

Note: This table presents the results of the GMM-SYS estimations to test H[4] obtained running Equation (1) and using DIO_ANGLO_SAXON as measure of DIO. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

DIO_P, DIO_GENDER and DIO_ACCOUNTANT variables.[8] The most representative firm in Cluster 1 (35 observations) exhibits a high percentage of accounting and finance experts with IO and no gender diversity. Conversely, the most representative firm in Cluster 2 (330 observations) does not appoint supervisory board members with IO, while those belonging to Cluster 3 (27 observations) have a majority of directors with IO, showing discrete gender diversity but no accounting and finance expertise (see Figure 1).

After clustering the observations, we perform an additional descriptive analysis using the clusters of firms. In particular, based on company-year level observations, we calculate the averages for our four disclosure index categories (NFDI_BUSIN, NFDI_ENVIR,

[8]We do not include the DIO_ANGLO_SAXON in the clustering presented in the manuscript due to the following reasons: as a dummy, it has a limited variability, and our checks prove that it does not further differentiate the clusters when the DIO_P, DIO_GENDER, and DIO_ACCOUNTANT are employed in the clustering procedure.

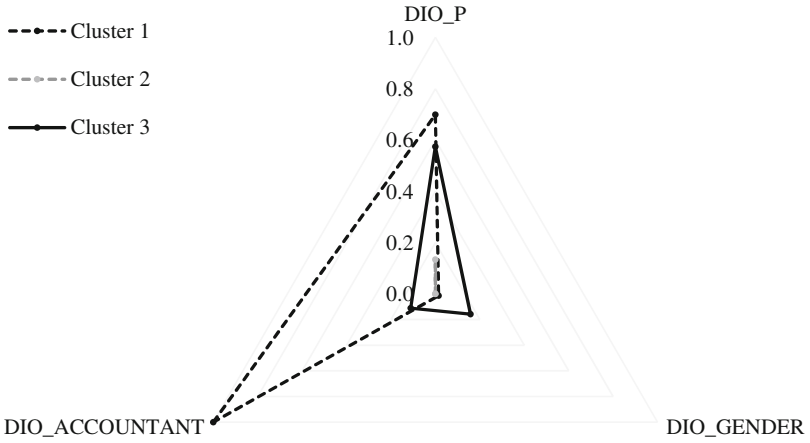

FIGURE 1 Results of clustering of firm-year observations: K-medoids of directors with international orientation indices in clusters.

	Cluster 1 (35 observations)	Cluster 2 (330 observations)	Cluster 3 (27 observations)
DIO_P	0.714	0	0.571
DIO_GENDER	0	0	0.142
DIO_ACCOUNTANT	1	0	0

Figure 1 displays the results of the k-medoid cluster analysis based on demographic and human capital characteristics of directors with international orientation. Medoids of the clustering are presented in table below Figure 1.
See Table 1 for variable definitions.

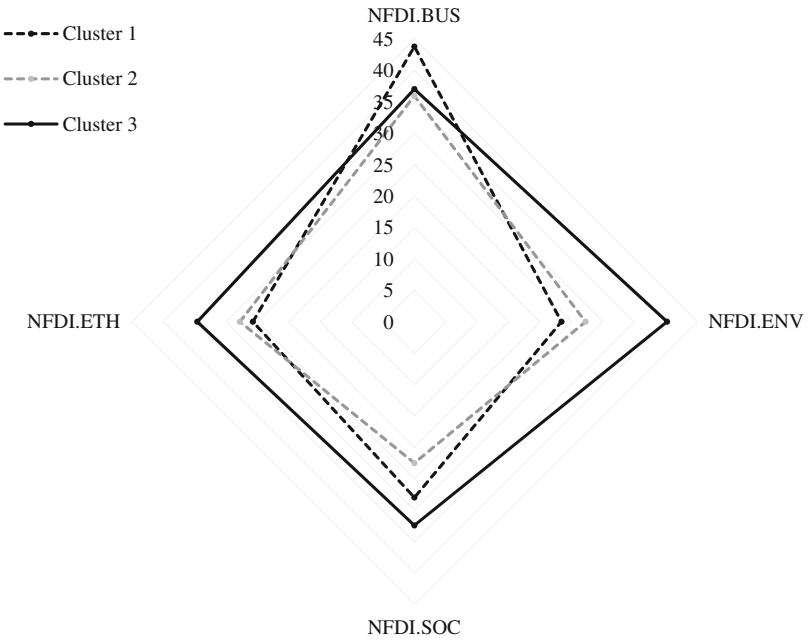

FIGURE 2 Results of clustering of firms: Mean values of NFD indices in clusters.

	Cluster 1 (35 observations)		Cluster 2 (330 observations)		Cluster 3 (27 observations)	
Variable	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev
NFDI_TOT	30.303	23.973	28.363	25.662	36.056	25.816
NFDI_BUSIN	43.810	19.837	35.960	21.010	37.037	25.142
NFDI_ENVIR	23.401	22.877	27.229	31.012	40.211	32.332
NFDI_SOC	27.977	25.914	22.488	21.874	32.408	20.844
NFDI_ETH	25.714	39.676	27.777	40.087	34.567	38.654

Figure 2 displays the results of the clustering analysis obtained by averaging the four disclosure index categories (NFDI_BUSIN, NFDI_ENVIR, NFDI_SOC, and NFDI_ETH) within clusters.
The means value for NFD indices in clusters are reported in the table below Figure 2.
See Table 1 for variable definitions.

TABLE 8 Additional analysis based on clustering variables.

Variables	(1) Cluster 1 versus 2	(2) Cluster 1 versus 3	(3) Cluster 2 versus 3
Panel A: NFDI = NFDI_TOT[a]			
CLUSTER_1	−13.30***	−3.098	
	(3.578)	(2.969)	
CLUSTER_2	−10.20***		3.098
	(2.352)		(2.969)
CLUSTER_3		10.20***	13.30***
		(2.352)	(3.578)
Controls	YES	YES	YES
Panel B: NFDI = NFDI_BUSIN[b]			
CLUSTER_1	−7.935	1.397	
	(7.505)	(3.929)	
CLUSTER_2	−9.332*		−1.397
	(5.209)		(3.929)
CLUSTER_3		9.332*	7.935
		(5.209)	(7.505)
Controls	YES	YES	YES
Panel C: NFDI = NFDI_ENVIR[c]			
CLUSTER_1	−21.50***	−7.314**	
	(5.184)	(3.150)	
CLUSTER_2	−14.18***		7.314**
	(4.445)		(3.150)
CLUSTER_3		14.18***	21.50***
		(4.445)	(5.184)
Controls	YES	YES	YES
Panel D:: NFDI = NFDI_SOC[d]			
CLUSTER_1	−9.836***	−0.0356	
	(3.453)	(2.802)	
CLUSTER_2	−9.801***		0.0356
	(2.701)		(2.802)
CLUSTER_3		9.801***	9.836***
		(2.701)	(3.453)
Controls	YES	YES	YES
Panel E: NFDI = NFDI_ETH[e]			
CLUSTER_1	−14.11**	−6.171	
	(6.575)	(5.974)	
CLUSTER_2	−7.938*		6.171
	(4.632)		(5.974)
CLUSTER_3		7.938*	14.11**
		(4.632)	(6.575)
Controls	YES	YES	YES
Observations	392	392	392
Number of firms	98	98	98

Note: This table presents the results of the GMM-SYS estimations to compare the clusters of firms according to the characteristics of directors with IO. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

[a]Panel A presents results of Equation (1) using NFDI_TOT as dependent variable.

[b]Panel B presents results of Equation (1) using NFDI_BUSIN as dependent variable.

[c]Panel C presents results of Equation (1) using NFDI_ENVIR as dependent variable.

[d]Panel D presents results of Equation (1) using NFDI_SOC as dependent variable.

[e]Panel E presents results of Equation (1) using NFDI_ETH as dependent variable.

TABLE 9 The role of directors with international orientation in sensitive and non-sensitive industries.

Variables	(1) NFDI_TOT	(2) NFDI_BUSIN	(3) NFDI_ENVIR	(4) NFDI_SOC	(5) NFDI_ETH
Panel A: DIO = DIO_P[a]					
DIO	−1.383	1.727	−6.157	2.233	−2.862
	(3.116)	(3.850)	(4.421)	(2.969)	(6.655)
DIO* SENSITIVE_SECTORS	17.13***	4.213	32.24***	14.62**	18.09*
	(5.046)	(6.743)	(9.160)	(5.851)	(10.68)
Controls	YES	YES	YES	YES	YES
Panel B: DIO = DIO_GENDER[b]					
DIO	55.60***	58.79***	79.67***	36.17**	48.37
	(19.49)	(22.00)	(26.71)	(16.44)	(32.25)
DIO* SENSITIVE_SECTORS	−23.00	−76.14	−18.52	37.73	−31.59
	(27.76)	(59.29)	(63.22)	(29.74)	(58.79)
Controls	YES	YES	YES	YES	YES
Panel C: DIO = DIO_ACCOUNTANT[c]					
DIO	−3.870	−1.165	−9.424**	−1.875	−4.340
	(3.332)	(5.404)	(3.807)	(3.055)	(6.772)
DIO* SENSITIVE_SECTORS	1.671	6.127	6.479	2.264	−4.696
	(4.384)	(6.258)	(4.378)	(4.086)	(8.812)
Controls	YES	YES	YES	YES	YES
Panel D: DIO = DIO_ANGLO_SAXON[d]					
DIO	0.778	1.609	−3.137	2.298	2.267
	(2.510)	(2.906)	(3.127)	(2.016)	(4.340)
DIO* SENSITIVE_SECTORS	4.204	−1.168	10.08**	3.718	4.742
	(3.206)	(3.903)	(4.372)	(3.255)	(5.902)
Controls	YES	YES	YES	YES	YES
Observations	392	392	392	392	392
Number of firms	98	98	98	98	98

Note: This table presents the results of the GMM-SYS estimations to check the role of directors with IO in sensitive versus non-sensitive industries. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.
[a]Panel A presents results of Equation (1) using DIO_P as measure of DIO.
[b]Panel B presents results of Equation (1) DIO_GENDER as measure of DIO.
[c]Panel C presents results of Equation (1) using DIO_ACCOUNTANT as measure of DIO.
[d]Panel D presents results of Equation (1) using DIO_ANGLO_SAXON as measure of DIO.

NFDI_SOC and NFDI_ETH) within clusters. This analysis reveals that the sample is skewed toward low disclosures, as more than 80% of observations belong to the second cluster with the lowest value of NFDI, while only 7% of them belong to Cluster 3 with the highest quality of disclosures (i.e., "disclosure champion"). If a firm is a "disclosure champion", then it reports relatively evenly in all thematic areas; however, its superiority over other clusters is most pronounced in disclosures related to environmental issues. Firms included in Cluster 2 report little information in all categories, especially in the area of society, while firms included in the middle cluster (Cluster 1) are the least interested in disclosures about the environment and ethics, but they mostly concentrated on business issues (see Figure 2).

To further corroborate our results, we employ clustering variables in our baseline regressions. Table 8 presents the results of the study.

Column 1 of Table 8 shows that both Clusters 1 and 2 are worse in terms of NFD scope compared to Cluster 3; Column 2 of Table 8 reports that the scope of NFD in Cluster 2 is worse than that in Cluster 3 but not different from Cluster 1 (except for NFDI_ENVIR). Column 3 of Table 8 highlights that the scope of NFD in Cluster 1 is worse than that in Cluster 3 (except for NFDI_BUS) but not different from that in Cluster 2 (except for NFDI_ENVIR).

Overall, the regression analysis based on clustering suggests that a supervisory board with a high share of directors with IO, including a decent share of females and only a negligible share of experts with accounting and finance backgrounds, boosts the NFD scope. It also confirms that it is insufficient to have directors with IO, but rather that they have to be differentiated in terms of gender, accounting, and finance expertise.

TABLE 10 The role of directors with international orientation before and after the implementation of EU directive.

Variables	(1) NFDI_TOT	(2) NFDI_BUSIN	(3) NFDI_ENVIR	(4) NFDI_SOC	(5) NFDI_ETH
Panel A: DIO = DIO_P[a]					
DIO	1.853	−2.412	5.999	5.480	−1.567
	(3.373)	(4.184)	(5.227)	(4.216)	(5.277)
DIO*POST_DIR	6.045	11.86	−1.300	4.120	10.68
	(8.208)	(8.186)	(9.874)	(7.504)	(14.63)
Controls	YES	YES	YES	YES	YES
Panel B: DIO = DIO_GENDER[b]					
DIO	24.37	−2.633	44.49	41.95*	9.130
	(23.75)	(30.62)	(37.91)	(23.79)	(35.22)
DIO*POST_DIR	46.19	72.78**	56.71	11.70	54.53
	(32.46)	(28.31)	(47.69)	(36.20)	(53.79)
Controls	YES	YES	YES	YES	YES
Panel C: DIO = DIO_ACCOUNTANT[c]					
DIO	−2.005	−1.367	−2.922	−0.927	−2.758
	(2.288)	(4.648)	(4.147)	(1.653)	(4.506)
DIO*POST_DIR	−2.944	2.196	−9.855*	−0.998	−3.899
	(4.540)	(4.686)	(5.191)	(4.709)	(10.60)
Controls	YES	YES	YES	YES	YES
Panel D: DIO = DIO_ANGLO_SAXON[d]					
DIO	−0.223	−2.044	0.383	1.383	−0.648
	(1.889)	(2.436)	(3.381)	(1.883)	(3.064)
DIO*POST_DIR	5.784	6.302	1.978	5.195	10.09
	(4.101)	(4.522)	(5.547)	(3.356)	(6.930)
Controls	YES	YES	YES	YES	YES
Observations	392	392	392	392	392
Number of FIRM_ID	98	98	98	98	98

Note: This table presents the results of the GMM-SYS estimations to check the role of international experts before and after the implementation of NF DIRECTIVE. Robust *SE*s are shown in parentheses. *, ** and *** refer to significance at the 10%, 5% and 1% levels, respectively. All variables are defined in Table 1.

[a]Panel A presents results of Equation (1) using DIO_P as measure of DIO.

[b]Panel B presents results of Equation (1) DIO_GENDER as measure of DIO.

[c]Panel C presents results of Equation (1) using DIO_ACCOUNTANT as measure of DIO.

[d]Panel D presents results of Equation (1) using DIO_ANGLO_SAXON as measure of DIO.

5.3.2 | The role of international experts in sensitive and non-sensitive industries

To further explore whether the documented positive relationship between DIO (and its characteristics) and NFDI varies according to the external pressure coming to the sector of belonging to the firm, we augment Equation (1) with an interaction term between our variable of interest (DIO) and the sectorial variable (SENSITIVE_SECTORS). The results in Panel A of Table 9 reveal that the positive and significant association between the supervisory board IO and NFD scope is stronger when companies belong to sensitive sectors and is particularly significant for NFDs related to socioenvironmental and ethical issues. However, we find that the positive association between DIO_GENDER and NFD scope remains significant for firms that do not belong to sensitive sectors (see Table 9, Panel B). The same occurs for the association between accounting experts with IO (DIO_ACCOUNTANT) and NFDI_ENVIR, which is negative and significant in firms with lower exposure (Table 9, Panel C). Conversely, experience in Anglo-Saxon countries (DIO_ANGLO_SAXON) is positively and significantly related to the scope of NFDI_ENVIR (Table 9, Panel D).

The role of international experts before and after the implementation of the EU's non-financial directive

With the introduction of the Directive, voluntary activities connected with non-financial information on environmental, social, and employee matters, as well as respect for human rights, anti-corruption, and

bribery issues, became mandated. To assess the effect of the Directive on NFD, we augment Equation (1) by introducing a dummy variable that is equal to 1 for the post-implementation period (POST_DIR) and interacting with our variables of interest to capture the presence and diversity among directors with IO. The results in Table 10 show that the implementation of the EU Directive exerts a weak influence on NFD as in the post-implementation period, particularly for the relationship between DIO_GENDER–NFDI_BUSIN (Table 10, Panel B) and DIO_ACCOUNTANT–NFD_ENVIR (Table 10, Panel C), which remains significant and in the expected direction.

5.3.3 | Testing for endogeneity

We acknowledge not only that NFDs are influenced by board IO but also that the opposite phenomenon are observable. Thus, to check the reverse causation scenario and potential endogeneity in the sample, we reformulated our estimations and treated the hypothesis testing variables (i.e., DIO_P, DIO_GENDER, DIO_ACCOUNTANT and DIO_ANGLO_SAXON) as only sequentially exogenous within the GMM-SYS framework. The new outcomes corroborate our baseline findings shown in Tables 4–7. For brevity, we do not present them in the manuscript; however, they are available upon request.

6 | DISCUSSION

Notably, CEE countries have been moving toward increased transparency in their reporting environments (Albu et al., 2020). The release of the EU Directive on NFD has been an important step forward in this direction that puts additional pressure on firms to conform to new international rules. In this study, we show that mobile governance, driving the increasingly international orientation of corporate boards (Hooghiemstra et al., 2019), can help firms to cope with this pressure. Directors with IO bring superior business experience, networks, and know-how (Masulis et al., 2012), as well as different cognitive structures and schemas (Nielsen & Nielsen, 2013) that allow them to think and act differently from local members of the board (Miletkov et al., 2017; Oxelheim & Randøy, 2003), thus increasing CSR engagement and enhancing NFD policies.

Overall, the findings are largely consistent with the expectations of resource dependency theory, which recognizes that corporate directors connote key resource access mechanisms for organizations (Salancik & Pfeffer, 1978). In particular, we add to prior studies on the effect of directors with IO on good governance practices (Giannetti et al., 2015) and analyse their influence on disclosure policies through increased monitoring and advising ability stemming from their superior knowledge of international best reporting practices. We complement this explanation from the perspective of upper echelons theory and, in line with prior studies (Piaskowska & Trojanowski, 2012), we suggest that both the foreign nationality of directors and the years of expertise gained abroad are important observable characteristics to be accounted for when considering board members' ability to develop a global mindset to cope with the application of international standards. Regarding the former, while some studies have found no association between foreign directors on the board and CSR reporting initiatives (Branco & Rodrigues, 2008), others have documented that they play a critical role in supporting CSR reporting strategies (Mehmoona & Kashif, 2014). We contribute to this debate by showing that international experts on supervisory boards can transfer their knowledge from countries with more robust governance mechanisms, thus ensuring greater attention to NFD. Regarding the latter, our findings corroborate the relevance of the years of expertise abroad for CSR engagement (Harjoto et al., 2018) and are particularly in line with studies highlighting the importance of long-term international experience versus short-term visiting experience (Zhang et al., 2018).

Our research differs remarkably from studies investigating board diversity and CSR (Bear et al., 2010; Hafsi & Turgut, 2013; Jizi et al., 2014; Khan et al., 2013; Muttakin et al., 2018). Unlike prior research (Beji et al., 2020; Rao & Tilt, 2016) our investigation focuses entirely on the role of the IO of directors and its impact on NFDs and recognizes that there are substantial differences in terms of gender, accounting, and finance experience, as well as country of origin. Indeed, we document that it may be not only the standalone IO of supervisory board members but also the bundle of human capital attributes that individual directors bring to the table that drives corporate choices in relation to NFDs. Our evidence that female directors with IO are more prone to adopt transparent NFD practices aligns with the long-standing literature that reports a positive link between board gender diversity and NFD (Fernandez-Feijoo et al., 2013). This growing body of research documents the advantages of having female directors (Xie et al., 2020), especially in one of their sub-committees (Bravo & Reguera-Alvarado, 2019). Similarly, there is evidence of the positive implications of a critical mass of females on boards (De Masi et al., 2021) and in upper echelon positions for the voluntary disclosure of CSR information (Valls Martínez et al., 2019), either at the international level (Pucheta-Martínez et al., 2021) or in emerging countries (Katmon et al., 2019). We provide a more nuanced view of the benefits of having experienced females educated abroad for the effective advising and monitoring functions of governance bodies in relation to NFD policies.

We also provide empirical evidence that the diversity in the country of experience affects directors' ability to influence NFD policies, albeit limited to social disclosure. This result is broadly in line with the view that board cultural diversity promotes a firm's commitment toward CSR (Martínez-Ferrero et al., 2021) and especially points toward achieving cross-cultural contamination between Eastern and Western economies, as ensured by the appointment of Polish directors who have acquired IO in Anglo-Saxon countries.

Conversely, we report that accounting and finance experts with IO negatively affect the scope of NFD, especially environmental disclosures. This result seems surprising if we consider the superior monitoring ability of accounting and finance experts (Pucheta-Martínez et al., 2021) and the documented significant association between financial expertise and NFD concerning intellectual capital (Haji, 2015). However, it also reveals the reported perplexities in the

accounting profession on NFD (Egan & Tweedie, 2018; Krasodomska et al., 2020) arising from a lack of legal standards, and the high costs of gathering non-financial data have not been superseded by the enactment of the EU Directive and supports the existing move toward new sustainability reporting standards.

Interestingly, our evidence on NFD in the period surrounding the release of the EU Directive adds to the recent literature on the implementation of the EU Directive (Cordazzo et al., 2020). Consistent with prior research (Dumitru et al., 2017; Krasodomska & Zarzycka, 2021), we report that the scope of NFD in Poland is limited. The largest amount of NFD refers to companies' business models, policies, risks related to CSR, and ethical issues. We expand this view by providing evidence that a higher amount of disclosure is provided by companies with more directors with IO appointed to the supervisory board.

Lastly, our analysis of the sectorial split between sensitive and non-sensitive industries supports the existence of a substitutive relationship between corporate governance and corporate transparency (Cormier & Magnan, 2014), suggesting that the demographic and human capital attributes of DIOs are likely to substitute for the transparency of NFD when facing environmental pressure.

Ultimately, our evidence adds to the research on the role of board structure in NFD (e.g., De Masi et al., 2021; Harjoto et al., 2015; Pucheta-Martínez et al., 2021; Valls Martínez et al., 2019; Xie et al., 2020) and points to the under-investigated reporting implications of directors' cognitive traits bundled with their demographics and human capital features.

7 | CONCLUSION

By adopting an original framework that integrates resource dependence with upper echelons theory herein, we attempt to gain a better understanding of the role of the IO of supervisory boards regarding NFD policies.

First, we adopt a unique NFD scope measure based on the recent EU regulation regarding non-financial and diversity information required by the Directive (EU, 2014) and position our analysis in the setting of WSE listed companies to exploit the two-tier board structure typical of this stock market.

Second, considering the diversity within the board, we deepen the analysis of the role of directors with IO regarding NFD with a finer look at the implications of their different demographic and human capital features. We support the argument that directors with IO are beneficial for the development of sustainable corporate behaviours through transparent NFD policies. We particularly find that female directors with IO benefit most of the scope of NFDs. Nonetheless, we show that the accounting and finance experience of directors with IO tends to focus less on non-financial aspects, especially on environment-related information. Lastly, we underscore that international expertise gained in Anglo-Saxon countries leads to the attainment of superior resources in the NFD process, as well as a greater ability to transfer global disclosure practices to the local firm, limited to the disclosure of societal issues.

The results of this study suggest that in the two-tier board model, the move toward sustainable development might benefit from the IO of the supervisory board, which contributes to the effective transfer of knowledge and best practices from countries with a different and often stronger corporate governance system, which in turn fosters the director's ability to advise and monitor NFDs. These findings may be of particular importance in countries with insufficient financial and, especially, non-financial reporting infrastructure and weaker transparency practices.

These results have important managerial and policy implications. First, companies can learn from our evidence that an effective recruitment policy should consider the IO of board members and set minimum requirements in terms of nationality diversity as well as the years of experience gained abroad. Second, policymakers attempting to issue the principle of good governance in the context of the two-tier model should be aware that board internationalization is an important driver of sustainable development. Third, our evidence that in the context of a mandatory disclosure regime, the scope of NFD largely depends on the incentives coming from the cognitive frame of corporate executives can be informative for standards' setters currently moving toward a more robust NFD regulation.

Similar to most empirical studies, our study has some limitations. We use an NFDI relying on the manual content analysis of corporate reports, focusing on the extent of disclosures around the implementation of the Directive. In doing so, we rely only on one dimension of the disclosure (i.e., the scope) without considering other qualitative features of the NFD and explore the role of IO on supervisory boards in one specific CEE country (i.e., Poland). Future research could deepen this analysis by measuring the quality of NFD, for instance, by looking at some textual features (e.g., tone) of disclosures and employing a larger dataset and sophisticated machine learning algorithms. Moreover, our evidence could be complemented by further qualitative research aimed at comprehensively exploring the role of IO on supervisory boards in developing sustainable corporate culture through increased transparency in NFDs.

Although our findings are potentially relevant to other CEE and emerging as well as less developed economies, future studies can consider comparative datasets that cover the entire CEE region or developing and emerging economies to gain a broader understanding of the similarities and dissimilarities in NFD policies. Furthermore, additional research efforts should be directed toward the investigation of the link between the board and NFD in light of developments in Europe's sustainability reporting landscape, including the Corporate Sustainability Reporting Directive proposed by the European Commission in April 2021 (EC, 2021).

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APPENDIX A: MEASURING NFDI

For the purpose of our article, we measure NFDI through a weighted disclosure index which capture the scope of the disclosures based on a manual content analysis performed on a list of pre-selected items. Two authors were responsible for the coding process. Coding consisted of transferring the information on companies' NFD to an observation sheet. Randomly selected documents were coded by each coder. The inter-coder reliability was assessed by Krippendorff's Alpha test and equalled 0.927. Any discrepancies were discussed in order to reach a consensus and ensure the consistency of coding.

Panel A provides details of the step-by-step coding rules. Panel B provides the list of the items coded. Panel C provides some examples of coding.

Panel A: Detailed coding rules

1. Access the corporate reports for the period 2014–2018 posted on the website https://standardy.org.pl/raporty-spolek/ or via the particular company's website
2. Create a separate sheet in the Excel file entitled CODING and title it "[Company Name] [Year]" (each company in a separate sheet in the same file)
3. Focus on the items included in the index based on the Directive 2014/95/EU (they are listed the Column 1 in the CODING file entitled "Disclosure Items" (see Panel B below)
4. Read the report carefully and assign values 1,2,3 to the disclosure items in Column 2 (entitled "Score") in the following way: 0—no presentation; 1—narrative presentation, 2—presentation using key performance indicators or other numerical/quantitative data, and 3 (1 + 2)—narrative and numerical presentation simultaneously
5. Include any relevant information in Column 3 (entitled "Additional Comments"), add report page number if necessary; any doubts regarding the coding should be reported and discussed with another coder
6. Transfer the data to the second Excel file entitled INDICES VALUES

Panel B: Items included in the index based on the Directive 2014/95/EU (included in Column 1 in the CODING file mentioned in Panel A)

I. Business model, policies, risks related to CSR issues
   1. Business model – brief description;
   2. Policies related to environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters;
   3. Principal risks related to environmental, social and employee matters, respect for human rights, anti-corruption and bribery matters;
   4. Non-financial KPIs.

II. Environmental matters
   1. Impacts on the environment;
   2. Impacts on health and safety;
   3. Use of renewable energy;
   4. Use of non-renewable energy;
   5. GHG emissions;
   6. Water use;
   7. Air pollution.

III. Social and employee related matters
   1. Actions taken to ensure gender equality;
   2. Implementation of fundamental conventions of the International Labour Organization;
   3. Working conditions;
   4. Respect for the right of workers to be informed and consulted;
   5. Respect for trade union rights;
   6. Health and safety at work;
   7. The dialog with local communities;
   8. Actions taken to ensure the protection and the development of the local communities.

IV. Ethical matters
   1. Prevention of human rights abuses, instruments in place to fight corruption and bribery.

Panel C: Sample of coding

Excerpt of management report	Source	Index item	Disclosure type	Score assigned
"due to [...] the increasing threat to employee safety, the company does not carry out exploration work in Libya"	Polskie Górnictwo Naftowe i Gazownictwo, Management report 2015, p. 41	Health and safety at work	Narrative	1
Employment in the Company and the Wielton Capital Group as at 31 December 2016. is presented in the table below: Total posts / Apprentices Company employees 1348 63 Group employees 1936 —	Wielton, Management report 2016, p. 83	Non-financial KPIs	Numerical	2
"The Women At AccorHotels Generation (WAAG) network of over 200 members in 6 countries has completed over 50 h of intensive workshops devoted to empowering women, lectured and launched the WAAG mentoring program"	Orbis, Management report 2015, p. 44	Actions taken to ensure gender equality	Narrative + numerical	3