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RESEARCH ARTICLE

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Board characteristics and sustainability in higher education institutions: The case of the United Kingdom

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Abstract

We explored the relationship between board characteristics and sustainability of higher education institutions in the United Kingdom (UK). We analysed 153 UK universities using data for the year 2019. Our analysis revealed that board size, the number of students on the board, and the number of academic members on the board were found to have significant and positive relationships with sustainability. Also, the composition of the sustainability committee was shown to have a significant and positive impact on sustainability score. However, the relationships between board gender diversity, the number of external members on the board, and the number of board meetings held during the year with sustainability score were not significant. The results provide guidance to universities for developing their sustainability practices.

1 | INTRODUCTION

Corporate growth is increasingly based on sustainable development and business ethics, and every corporation should endeavour to balance stakeholders' pressure with its cultural and corporate social responsibilities (Singh & Gaur, 2020); especially with the increase in global recognition regarding the adverse environmental impact resulting from economic growth (Almashhadani & Almashhadani, 2023). Sustainability is a strategy of the sustainable

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development process (Kocmanová et al., 2011), and it is a way of creating the company's value by maximizing the positive impact and minimizing the negative impact of its activities on the environment, society, and the whole economy (Krechovská & Procházková, 2014).

Corporate governance plays a decisive role in creating sustainable corporate development as the former is the set of relationships between the company's management, board of directors, shareholders, and other stakeholders (Crifo et al., 2019). As stated by Krechovská and Procházková (2014), sustainability, in relation to corporate governance, is seen as the ability of a corporation to positively influence environmental, social, and economic development through its management practices and market presence. Governance is a broader concept that includes not only the quality of management but also a strategic vision of the company's role in society (Shrivastava & Addas, 2014).

Based on the agency theory and resource dependency theory, several scholars have reported that board composition plays a significant role in determining the level of companies' involvement in sustainability activities (Qaderi et al., 2022; Shamil et al., 2014). Furthermore, based on the stakeholder theory, the role of inclusion of stakeholders on the board of directors in enhancing companies' sustainable development was also highlighted in the existing literature (García Martín & Herrero, 2020). According to the aforementioned arguments, our paper aims to answer the following two main questions: what is the impact of universities' board composition and diversity on the level of sustainability? and would the involvement of stakeholders in the universities' boards enhance their level of sustainability?

Most of the prior studies that examined the relationship between corporate governance and companies' environmental performance have focused on examining the impact of corporate governance on companies' disclosure regarding their environmental and social activities. For example, Michelin and Parbonetti (2012) reported that the board of directors is responsible for determining the level of sustainability disclosure. Tran et al. (2021) examined the effect of board size on sustainability disclosure. Cucari et al. (2018) explored the relationship between board independence and corporate social responsibility (CSR) disclosure. Elmghaamez et al. (2023) reported that the sustainability committee positively affects the level of Environmental, Social, and Governance (ESG) disclosure. In the higher education sector, Ntim et al. (2017), Elmagrhi et al. (2021), and Elmagrhi and Ntim (2023) examined the impact of governance mechanisms of higher education institutions (HEIs) in the United Kingdom (UK) on the level of voluntary disclosure. Consequently, this paper contributes to the existing literature in different ways as follows: first, a review of prior work revealed that the relationship between board characteristics and sustainability in the higher education sector has not been examined; hence, it is the first work to examine this relationship with a focus on HEIs in the UK. Second, given the important role of HEIs in shaping and improving the understanding and implementation of sustainable development among their communities, this paper provides recommendations for these institutions regarding the best formation of their boards in order to better contribute to sustainable development. Third, this work was conducted with the intention of comprehensively examining the extent to which universities' board characteristics influence their environmental, social, and economic development and their ability to achieve the desired competitive advantage; this led to the inclusion of some characteristics that were not included in the prior literature, such as the existence and effectiveness of sustainability committee as part of university structure, as these committees were expected to have a significant role in guiding the sustainability practices of the university.

This paper is structured as follows: the next section highlights the governance structure of the HEIs in the UK. The third section presents a discussion of the theoretical framework arguments related to the relationship between corporate governance and sustainability. The fourth section provides a discussion of the theoretical and empirical aspects that underpinned behind our proposed hypotheses. The fifth section demonstrates the research methods and measurements of variables that we implemented in the current paper. The sixth section highlights the findings of the data analysis and presents a discussion and interpretation of our findings. Finally, the last section includes our conclusion and draws out implications for theory and practice.

2 | BACKGROUND

The context of higher education in the UK has undergone significant transformations, marked by a commitment to fostering financial stability, internal governance, accountability, transparency, and enhanced performance (see, for example, Ntim et al., 2017). This commitment is evident in the extensive and sustained higher education reforms, often driven by new public management (NPM) discourses and central government funding cuts (e.g., Jarratt, 1985; Ntim et al., 2017).

The governing structures of universities in the UK are established using the Guide for Members of Governing Bodies of Universities and Colleges in England, Wales and Northern Ireland (CUC, 2020), which was initiated in 1995 by the Committee of University Chairmen (CUC) in collaboration with the Higher Education Funding Council. All universities should have a governing body that is responsible for overseeing their activities and determining their future direction. The governing body of the university is the council, which is primarily responsible for ensuring financial sustainability and fulfilling its legal obligations. In this paper, all those governing UK universities are referred to as 'directors', with this term intended to encompass directors, governors, and trustees.

The higher education sector was recognized as having an important role in supporting environmental protection and ensuring sustainable development due to its significant impact on society (Dagilūtė et al., 2018). Universities have begun to incorporate sustainable development education into their systems (Lozano et al., 2015). The significance of the HEIs' role in shaping sustainable development is based on the idea that they have the potential to encourage the application of different types of knowledge to produce social change (Stephens et al., 2008). Moreover, these institutions are constantly improving their conceptualization of sustainable development in all areas of their activities; this involves implementing sustainable development principles, starting centrally with research and development programmes and ending with administrative practices.

In addition, the UK higher education sector has been a pioneer in implementing policies that emphasize sound financial management through robust internal governance arrangements. Jones et al. (2001) highlight the significant role of governance structures in ensuring effective decision-making and resource allocation, among other issues. Boards of HEIs have been instrumental in promoting financial responsibility and ensuring that resources are allocated efficiently. Furthermore, the push for enormous public accountability and transparency has been a basis of UK higher education reforms. Vidovich and Currie (2011) noted that heightened scrutiny from stakeholders necessitates institutions to be more transparent in their operations. Notably, boards play a key role in establishing accountability mechanisms, disclosing financial information, and building trust with the public. This transparency is essential not only for public perception but also for attracting funding and partnerships crucial for the sustainability of HEIs.

In conclusion, the board characteristics within UK HEIs have been fundamental in driving the sector towards sustainability. The focus on financial management, governance, public accountability, and transparency reflects a commitment to ensuring the long-term viability of institutions. The historical context of reforms underscores the sector's ability to evolve and adapt, demonstrating the resilience of higher education boards in the face of changing dynamics. As the UK higher education sector continues to evolve, the role of boards in driving sustainability will remain a critical factor in shaping its future.

3 | THEORETICAL FRAMEWORK

Corporate governance has gained scholars' attention as a driver for better sustainability strategies. Fakir and Jusoh (2020) reported that there is a demand for better corporate governance to enhance companies' sustainability. The board of directors is considered one of the most important corporate governance mechanisms, as it plays a significant role in ensuring that shareholders' interests are represented (Beiner et al., 2004), and monitoring companies' decisions and resources allocation (Endrikat et al., 2021).

The review of the prior literature revealed that most of the prior studies that examined corporate governance have adopted the agency theory in explaining the role of corporate governance in affecting a company's environmental and social involvement. Implementing the agency theory in corporate governance-related studies refers to the fact that the board of directors is seen as a monitoring tool to mitigate the negative issues of principal-agent relationship (Yusoff & Alhaji, 2012). This is due to the fact that there is a conflict of interest between principals and agents, which results in the agency cost (Jensen & Meckling, 1976). Regarding the relationship between corporate governance and sustainability, the agency theory suggests that the board of directors is responsible for monitoring companies' sustainable policies and strategies (Bae et al., 2018). This stands on the idea that managers tend to invest in opportunities that generate short-term benefits, and hence avoid investing in sustainable activities, as the latter does not generate immediate benefit to the company (De Villiers et al., 2011).

The stakeholder theory was also found to be adopted by prior work that explored sustainability. This theory states that a company should not aim only to serve the benefits of shareholders but also the benefits of the wider range of stakeholders (Schaltegger et al., 2019). Based on such a theory, the role of corporate governance is to monitor the companies' activities, including activities related to the environment and society as a response to stakeholders' pressure (Naciti et al., 2021). Michelon and Parbonetti (2012) demonstrated that sustainability disclosure is a tool to enhance a company's relationship with its stakeholders. Furthermore, prior studies have also adopted the resource dependency theory, Yusoff and Alhaji (2012) stated that such a theory suggests that it is very important to ensure the environmental connection between the company and external resources. Rubino and Napoli (2020) expressed that a company's environmental performance is linked to improving the resources available to the board members.

However, Alatawi et al. (2023) recommended adopting a multitheoretical approach when examining issues related to CSR. Therefore, we adopted the agency theory, resource dependency theory, and stakeholder theory in examining the relationships between our research variables. We aim to examine the impact of a number of universities' board characteristics on their sustainability scores. These characteristics are board size, board gender diversity, board independence, student members, academic members, size of the sustainability committee, and gender diversity of the sustainability committee. Below is a discussion of the theoretical aspects and previous empirical results of the relationship between each of these characteristics and sustainability, in addition to a presentation of our proposed hypotheses.

4 | LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

4.1 | Board size

The optimal size of the board of directors has not been precisely formulated in the existing literature. Scholars have suggested that the board must be large enough to provide the corporation with the necessary information and resources, as well as being small enough to operate as efficiently as possible (see, for example, Anand, 2007). The agency theory suggests that larger boards have more communication obstacles, and hence higher agency problems (Cheng, 2008). However, the resource dependency theory states that increasing the number of directors provides several benefits to the company, such as increasing the board's monitoring capacity, having greater knowledge and background diversity on the board, and increasing the firm's access to necessary resources (Koufopoulos et al., 2020). Moreover, the findings underscore that the board's allocated resources wield a direct influence on the company's overall performance. This underscores the critical imperative of establishing robust connections between the company and essential external resources, thereby optimizing the organization's outcomes (Aly et al., 2023; Abdelqader et al., 2021; Pfeffer & Salancik, 2003). Hu and Loh (2018) articulated that expansive boards furnish the company with invaluable networks, ensuring it remains abreast of the latest developments in sustainability trends. Consonantly, Githaiga and Kosgei (2023) posit that larger boards are likely to

comprise members boasting diverse expertise and experience in environmental and social matters. This, in turn, bolsters the company's CSR engagement and disclosure practices.

In regard to the relationship between board size and sustainability, it was reported that the board size is significantly and positively correlated with sustainability reporting and performance (see Mahmood et al., 2018). Tran et al. (2021) found that board size positively affects corporate sustainability disclosure. Chams and García-Blandón (2019) concluded that larger boards of directors are more often seen as diverse groups that are more likely to be sensitive to shareholders' concerns, thereby engaging more in social or environmental practices. However, Hussain et al. (2018) found no significant relationship between board size and sustainability. Also, Karim et al. (2020) found that board size is not correlated with CSR practices. Cuadrado-Ballesteros et al. (2017) conducted a study that found evidence of a rather unusual inverted-U-shaped relationship between board size and CSR practices, implying that larger boards are positively related to CSR practices, but only up to a certain point. They justified their results based on the idea that when the number of directors is too large, the company develops CSR practices to a lesser extent, mainly because directors may have different opinions and points of view, which makes agreement between them difficult to achieve.

Despite the aforementioned mixed arguments, we built our assumption regarding the relationship between board size and sustainability based on the articulations of the resource dependency theory, which states that larger boards provide the company with the needed knowledge and experience to enhance its social and environmental performance. Hence, our first hypothesis is stated as follows:

Hypothesis 1. There is a significant relationship between board size and sustainability at universities in the UK.

4.2 | Board gender diversity

In line with agency theory, the anticipation is that board diversity will augment the monitoring function of management, serving as a crucial mechanism in mitigating agency conflicts. This is achieved by fostering an environment that encourages top management to proactively disclose information about the institution's current situation, as posited by Zaid et al. (2020). Ntim et al. (2017) reported that board gender diversity of HEIs in the UK positively affects the level of voluntary disclosure. Moreover, according to the resource dependency theory, board diversity is posited to equip the board of directors with enhanced knowledge and skills (Reguera-Alvarado et al., 2017). Diverse groups are recognized for their capacity to offer a more extensive array of information, knowledge, and perspectives in contrast to homogeneous groups (Buse et al., 2016).

Empirically, Williams (2003) established a link between the percentage of female members on the board and the company's involvement in community service. Fernandez-Feijoo et al. (2014) stated that companies featuring a minimum of three female directors on their boards exhibit a higher commitment to sustainability reporting. Furthermore, Kassinis et al. (2016) discovered that both the demographic composition of the board and structural gender diversity play pivotal roles in shaping corporate environmental initiatives. Moreover, they suggested that the level of gender diversity reflects the broader orientation of the company's policies and practices and has a measurable impact on corporate environmental sustainability practices. Furthermore, using a sample of 362 companies from 46 different countries, Naciti (2019) reported that board gender diversity is significantly and positively related to sustainable performance, particularly social and environmental performance. In addition, Cullinan et al. (2019) stated that having more female directors on the board is linked to higher CSR strength. However, Shamil et al. (2014) found a negative and statistically significant relationship between sustainability and boards with female directors. While Fakir and Jusoh (2020) showed an insignificant link between gender diversity and sustainability in Bangladesh.

Based on the previous discussion, and despite the mixed results reported by prior studies, we formulated our second hypothesis based on the propositions of the agency theory and the resource-based theory that the

existence of female directors on the board will improve a university's sustainability score. Therefore, the second hypothesis could be stated as follows:

Hypothesis 2. There is a significant relationship between the number of female members on the board and sustainability at universities in the UK.

4.3 | Independent directors on the board

The inclusion of independent directors on the board is recommended by many of the international corporate governance best practices, on the basis that external directors promote the interests of shareholders to a greater extent, which mitigates the agency problem (Rashid, 2018). In this respect, the Higgs Report (2003) recommended that at least half of the board should be independent in order to enhance the effectiveness of the management board. Non-executive directors can effectively operate to provide objective business judgements as they are independent from the company's management (Fuzi et al., 2016). Furthermore, resource dependency theory suggests that organizations are dependent on external resources such as financial, human, and social resources to achieve their goals (Pfeffer & Salancik, 2003). In the case of universities, independent members on the board represent a source of external resources for the university as they may bring in financial resources, expertise, and social connections that are necessary for the university's sustainability.

Prior research on the relationship between board independence and sustainability performance has yielded inconclusive results. Notably, Cucari et al. (2018) highlighted a connection between the presence of independent directors and CSR disclosure, emphasizing the positive impact of independent directors on transparency and the voluntary disclosure of information. Elmagrhi et al. (2021) asserted a positive influence of board independence on the level of voluntary disclosure within HEIs in the UK.

Conversely, employing a meta-analysis approach, Endrikat et al. (2021) identified a positive relationship between board independence and CSR practices. However, Shahbaz et al. (2020) presented empirical evidence contradicting this, suggesting that a higher percentage of non-executive directors does not significantly predict a company's commitment to CSR. In a different vein, Naciti (2019) reported an inverse relationship, stating that a higher number of independent directors on the board is associated with lower sustainability performance. The contrasting findings underscore the complexity of the relationship between board independence and sustainability outcomes.

Grounded in the theoretical framework of agency theory, we posit that the inclusion of independent members on a university's board will positively impact its sustainability. Accordingly, our third hypothesis is articulated as follows:

Hypothesis 3. There is a significant relationship between the number of independent members on the board and sustainability at universities in the UK.

4.4 | Student members

Student engagement within the educational milieu is underpinned by Astin's (1984) theory of student involvement, which posits that students dedicate both physical and mental efforts to enhance their academic experiences and contribute to the betterment of their educational surroundings. Expanding on this concept, Matthews (2016) introduced a perspective that envisions students as active partners, a notion gradually gaining cultural acceptance within universities. According to Matthews, student involvement in partnerships is a process-oriented endeavour, mirroring the dynamic and continuous nature of learning that should define HEIs. The stakeholder theory posits

that sustainable development should be characterized by the creation of value for a diverse array of stakeholders (Schaltegger et al., 2019). This theoretical framework not only offers insights but also guides organizations in aligning their activities with societal expectations and sustainability needs (Camilleri, 2017). Among these stakeholders, students occupy a prominent role, and involving them in the decision-making process is recognized in the literature as a strategic management tool for enhancing efficiency in school administration (Ofosu, 2018). Acknowledging students as vital contributors, they are seen as capable of presenting innovative ideas and suggesting improvements in the current functioning of universities (Dagiliūtė et al., 2018). In this context, their active involvement not only aligns with stakeholder theory but also positions students as valuable contributors to the overall sustainability and progress of educational institutions.

There is a lack of studies examining the impact on sustainability of the presence of students on a university's board of directors. Some scholars have suggested that students' participation in university management is beneficial for its sustainability planning. For example, Abd-Razak et al. (2011) demonstrated that students' opinions and insights can influence the planning process of the sustainable development of a university campus as they can correctly identify areas of weak development, so considering their comments would improve the sustainability of a university's campus. Nejati and Nejati (2013) stated that students' evaluation of a university's sustainability helps its administration to implement more sustainability initiatives. Based on the available literature and the propositions of the stakeholder theory, which strongly emphasizes the importance of students' involvement in the decision-making processes of universities due to their positive impact on the sustainability of these universities, the following hypothesis can be drawn:

Hypothesis 4. There is a significant relationship between the number of student members on the board and sustainability at universities in the UK.

4.5 | Academic members

Another aspect scrutinized in previous studies concerning university boards is the inclusion of academic representatives. Academic directors, renowned for their elevated standing, undergo training to cultivate independence and critical thinking, allowing them to form their own opinions and judgements (see Jiang & Murphy, 2007). The premise that having academic members on the board is advantageous aligns with the resource dependency theory. This theory suggests that the resources furnished by the board wield a direct impact on a company's performance. Consequently, a more extensive pool of company resources not only fortifies the connection between the organization and external factors but also fosters heightened company confidence and reduces transaction costs (Hillman & Dalziel, 2003).

Empirically, Cho et al. (2017) stated that university professors are obligated to help their societies and reported a positive relationship between the presence of professors on a company's board of directors and CSR performance. However, there is a lack of studies examining the impact of the presence of academic board members on sustainability performance in the higher education sector, as most studies have explored the impact of having academic board members only on company performance. For example, Audretsch and Lehmann (2006) noticed that academic directors are primarily researchers and experts in certain fields, and therefore their presence on a management board may increase a company's competitive advantage by providing wider access to and absorption of external knowledge. Francis et al. (2015) showed that the presence of academics in the conference room is associated with higher company performance and that companies with academics on the board have greater directorial sensitivity to rotation performance, more patents and citations, higher quality of earnings, and higher informativeness of stock prices. According to the arguments of the resource dependency theory, we expect that the presence of academic members on the board will provide university management with the required knowledge and experience to enhance the university's sustainability. Hence, our fifth hypothesis can be stated as follows:

Hypothesis 5. There is a significant relationship between the number of academic members on the board and sustainability at universities in the UK.

4.6 | Number of board meetings

Board meetings are considered an important source of information, as they are primarily excellent platforms for discussing a company's operational matters and making the right decisions based on the uniform consent of all the members of the board (Ting et al., 2018). Furthermore, the number of board meetings has been reported to have a significant effect on a company's results in all aspects of its activities (Gómez et al., 2017). Increasing the frequency of board meetings is considered one of the methods to improve board efficiency, as increasing the number of meetings enhances directors' ability to obtain specific information about an institution and monitor it effectively (Johl et al., 2015). Agency theory looks at the number of board meetings as an indication of the board's diligence, as these meetings increase the interaction among board members and enhance their ability to monitor the company and respond to stakeholders' needs (Hussain et al., 2018).

Empirically, Ntim and Osei (2011) showed a statistically significant and positive relationship between the frequency of board meetings and the company's financial and non-financial results, implying that companies that meet more often tend to achieve better financial results. However, Ting et al. (2018) suggested that the frequency of board meetings is negatively correlated with the company's financial performance; their results suggested that boards of directors often meet only after noticing poor financial results, and they stated that the quality of board meetings is more important than the number of meetings.

Similarly, previous results regarding the relationship between the number of board meetings and sustainability and CSR reporting were general. For instance, Hu and Loh (2018) demonstrated that companies with more frequent board meetings throughout the year exhibit a greater inclination towards engaging in sustainability reporting, and the quality of their reporting is correspondingly higher. In a similar vein, Hussain et al. (2018) delved into the impact of the frequency of board meetings on environmental performance, revealing that an increase in the number of board meetings correlates with a better focus on social responsibility within the company.

Contrastingly, Ting et al. (2018) introduced a differing perspective, asserting that board meetings exert a negative and significant influence on sustainability disclosure. According to their findings, a higher frequency of board meetings is associated with a lower level of sustainability performance by the company. These diverse outcomes underscore the nuanced relationship between board meeting frequency and sustainability practices, emphasizing the need for a nuanced understanding of the contextual factors influencing such dynamics. Harymawan et al. (2020) suggested that this negative relationship could be explained by the idea that managers believe that information on a company's financial results is more desirable by the market than information related to sustainability, and only when the company suffers a financial loss does it seek to disclose information on sustainability, to cover up its financial performance. Nevertheless, we expect that increasing the number of university board meetings will enhance universities' sustainability as it is considered an indication of the board's diligence. Thus, our sixth hypothesis is stated as follows:

Hypothesis 6. There is a significant relationship between the number of board meetings and sustainability at universities in the UK.

4.7 | Existence of sustainability committee in university structure and its composition

Based on the propositions of the stakeholder theory, it is expected that the existence of a sustainability committee enhances a company's orientation towards better environmental performance. This is justified because

a company's management tends to implement environmental activities that are in line with the policies and recommendations of the sustainability committee that are designed to ensure implementing activities that are in favour of the stakeholders (Valle et al., 2019). The existence of a sustainability committee indicates a company's commitment towards sustainable development and better stakeholders' interest management (Hussain et al., 2018). Moreover, the resource dependency theory posits that an organizational structure incorporating a sustainability committee or department equips an institution with the essential resources to pursue and advance sustainable development (Umar, 2020).

Mallin and Michelon (2011) stated that having a sustainability committee positively affects a company's community performance. Biswas et al. (2018) and Hussain et al. (2018) stated that the existence of a sustainability committee in a company enhances its social and environmental performance. According to Orazalin (2020), the presence of a board sustainability committee has a positive correlation with corporate environmental and social performance. This is because the committee can provide effective CSR strategies that improve overall corporate sustainability efforts. Elmghaamez et al. (2023) reported that the sustainability committee positively affects the level of ESG disclosure. Endrikat et al. (2021) stated that having a CSR committee has a positive effect on a company's CSR. In this study, we aim to assess the efficacy of sustainability committees in enhancing universities' sustainability by considering two pertinent dimensions: the total number of sustainability committee members and the presence of female committee members. Despite the absence of explicit endorsement in the existing literature, we have formulated two research hypotheses pertaining to sustainability committees. These hypotheses are derived from the rationale presented earlier in alignment with the stakeholder and resource dependency theories:

Hypothesis 7. There is a significant relationship between the number of members in the sustainability committee and sustainability at universities in the UK.

Hypothesis 8. There is a significant relationship between the number of female members in the sustainability committee and sustainability at universities in the UK.

5 | RESEARCH DESIGN

5.1 | Data collection and sampling

To examine the relationship between board characteristics and sustainability, we collected the sustainability rankings of the universities in the UK for 2019 (People & Planet, 2019). Financial data were collected from the Higher Education Statistics Agency (HESA) website, and board characteristics were collected from the universities' annual reports and websites. We intended to include all the universities in the UK, however, the data regarding the sustainability score were not available for all universities. Therefore, we decided to include the universities only that have available sustainability score published on the People and Planet website. According to People and Planet (2019), the study population included 154 universities as of the end of 2019, and 153 of them were included in the analysis as the data of the other research variables were not available for one university.

5.2 | Variables' measurement

5.2.1 | Dependent variable

A university's sustainability level was considered the dependent variable in this research. The sustainability scores for the UK universities were collected from People and Planet (2019); the individual elements included

in the assessment of sustainability level are Environmental policy and strategy, Human resources and staff, Environmental auditing and management system, Ethical investment and banking, Carbon management, Workers' rights, Sustainable food, Staff and student engagement, Education for sustainable development, Energy sources, Waste and recycling, Carbon reduction, and Water reduction. The weight of such elements in calculating the sustainability score is presented in Table 1.

5.2.2 | Independent variables

The characteristics of the boards of directors of the UK universities were considered the independent variables in this study including board size (measured as the number of directors serving on the board), board gender diversity (measured as the percentage of female directors on the board), board independence (measured as the percentage of external directors on the board), students on the board (measured as the percentage of students on the board), academics on the board (measured as the percentage of academic members on the board), board meetings (measured as the number of university board meetings held during the year), sustainability committee size (measured as the number of members of the sustainability committee), and sustainability committee gender diversity (measured as the percentage of female members in the sustainability committee). Data representing these variables were obtained from the annual reports of universities for the financial year 2018/2019 and the universities' websites. Table 2 presents the measurements of these independent variables.

5.2.3 | Control variables

This study also includes a number of control variables that may affect the relationship between board characteristics and the level of sustainability of UK universities. These variables are as follows: profitability (a measure of the university's efficiency and ability to obtain a return on investment based on its resources; it was measured by the surplus as a percentage of total income), net cash flow (measured as net cash flow from operating activities as a percentage of total income), audit quality (being audited by one of the Big 4 audit companies around the world (PricewaterhouseCoopers

TABLE 1 Weights of elements of level of sustainability.

Category	Weight (%)
Environmental policy and strategy	4
Human resources and staff	8
Environmental auditing and management system	10
Ethical investment and banking	7
Carbon management	7
Workers' rights	6
Sustainable food	4
Staff and student engagement	5
Education for sustainable development	10
Energy sources	8
Waste and recycling	8
Carbon reduction	15
Water reduction	8

Source: <https://peopleandplanet.org/university-league-methodology>.

TABLE 2 Measurements of independent variables.

Variable	Measurement
Board size	The number of directors serving on the board of a university
Board gender diversity	The percentage of female directors on the board
Board independence	The percentage of external directors on the board
Students on the board	The percentage of students on the board
Academics on the board	The percentage of academic members on the board
Board meetings	The number of university board meetings during the year
Sustainability department size	The number of members of the sustainability department
Sustainability department gender diversity	The percentage of female members in the sustainability department

(PwC), Deloitte, Ernst & Young (EY), and Klynveld Peat Marwick Goerdeler (KPMG)), where a dummy variable was used by coding 1 for the university that was audited by one of the Big 4 companies and 0 otherwise), membership of the Russell Group, which is a group of world-class universities that are research-intensive, each with its own history and ethos (this variable was measured as a dummy variable, where the university was coded 1 if the external auditor was one of the Big 4 audit companies and 0 otherwise), age (which represents the number of years since the establishment of the university; it was measured by calculating the logarithm of the number of years since the establishment of the university), and total assets (measured as the logarithm of the total assets of the university). The data related to the control variables were extracted from HESA website. Table 3 presents the measurements of the control variables.

5.3 | Empirical model for regression analysis

Below is the model we constructed to evaluate the impact of universities' board characteristics on their sustainability:

$$\text{SUSTAIN}_{it} = \alpha_0 + \beta_1 \text{BSIZE}_{it} + \beta_2 \text{BGDVR}_{it} + \beta_3 \text{BIND}_{it} + \beta_4 \text{BSTUD}_{it} + \beta_5 \text{BACAD}_{it} + \beta_6 \text{BMEET}_{it} + \beta_7 \text{SDMEMB}_{it} + \beta_8 \text{SDDVR}_{it} + \beta_9 \text{PROF}_{it} + \beta_{10} \text{NCFL}_{it} + \beta_{11} \text{AUDIT}_{it} + \beta_{12} \text{RUSS}_{it} + \beta_{13} \text{AGE}_{it} + \beta_{14} \text{ASSET}_{it} + \epsilon_{it}$$

where SUSTAIN_{it} , the university's level of sustainability; BSIZE_{it} , the number of board members; BGDVR_{it} , the percentage of female directors on the board; BIND_{it} , the percentage of external directors on the board; BSTUD_{it} , the percentage of student members on the board; BACAD_{it} , the percentage of academic members on the board; BMEET_{it} , the number of board meetings during the year; SDMEMB_{it} , the number of members in the sustainability committee; SDDVR_{it} , the percentage of female members in the sustainability committee; PROF_{it} , surplus as a percentage of total income; NCFL_{it} , net cash flow from operating activities as a percentage of total income; AUDIT_{it} , a dummy variable was used: the university was coded 1 if the external auditor was one of the Big 4 audit companies and 0 otherwise; RUSS_{it} , a dummy variable was used: the university was coded 1 if it was a member of the Russell Group and 0 otherwise; AGE_{it} , the logarithm of the number of years since the date of the establishment of the university; ASSET_{it} , the logarithm of the total assets of the university.

6 | EMPIRICAL RESULTS AND DISCUSSION

This section presents the empirical results of the data analysis carried out in this paper to examine and explain the relationship between a number of the characteristics of UK universities' boards of directors and the universities' sustainability.

TABLE 3 Measurements of control variables.

Variable	Measurement
University profitability	Surplus as a percentage of total income
Net cash flow	Net cash flow from operating activities as a percentage of total income
Audit quality	A dummy variable was used: the university was coded 1 if the external auditor was one of the Big 4 audit companies and 0 otherwise
Membership of Russell Group	A dummy variable was used: the university was coded 1 if it was a member of the Russell Group and 0 otherwise
University age	The logarithm of the number of years since the establishment of the university
Total assets	The logarithm of the total assets of the university

6.1 | Regression analysis

We first present the descriptive statistics of the control and independent variables in Table 4. We then employed the hierarchical regression analysis; the regression analysis was performed after checking the problem of multicollinearity among the variables included in the empirical model using the variance inflation factor (VIF) test. The results of the VIF test are presented in Table 5 and indicate no evident multicollinearity, as only values of VIF above 10 indicate the existence of multicollinearity (e.g., Thompson et al., 2017). Table 5 also presents the results of the hierarchical regression analysis.

In the first step, the model was run for the control variables: profitability, net cash flow, Big 4, membership of the Russell Group, university age, and total assets. In the second step, the universities' board characteristics were added to the model to examine their effect on the universities' sustainability scores. Having controlled for the impact of the control variables, the value of R^2 of the sustainability score was computed ($R^2 = .453$, $p < .001$). This value implies that the selected board characteristics explained a significant incremental level of the variations in the sustainability scores, in addition to the level that the control variables explained ($\Delta R^2 = .40$, F for $\Delta R^2 = 12.87$, $p < .001$). Because the F -ratio in this study is considered to be highly significant ($p < .001$), it can be argued that this model is able to explain the changes in the dependent variable. Furthermore, the value of R^2 ($R^2 = .453$) is relatively close to the value of the adjusted R^2 ($\Delta R^2 = .408$), which supports the suggestion that our results are generalizable. The disparity between the two values is insignificant (0.044), implying that if this model were run for the whole population rather than the included sample, around 4.4% less variance in sustainability score would be recorded.

Moreover, as recorded in Table 5, a significant and positive relationship was reported between the size of the university board and sustainability ($\beta = .180$, $p < .05$), which supports Hypothesis 1 of this research. Hypothesis 2 assumed a significant and positive relationship between the percentage of female members on the university board and its sustainability; however, based on the regression results ($\beta = .059$, $p > .05$), it was rejected. Likewise, the results related to Hypothesis 3, which suggested the existence of a positive and significant relationship between the percentage of external directors in the university's governing structure and sustainability score, were not significant either ($\beta = .048$, $p > .05$), and therefore it was rejected. Hypothesis 4 proposed a positive relationship between the number of students on the university board and sustainability, which was supported as the results were significant ($\beta = .135$, $p < .05$). Similarly, the assumption of Hypothesis 5, that there is a positive and significant relationship between the number of academic members on the university board of directors and sustainability, was accepted as the regression results were significant ($\beta = .144$, $p < .05$). Hypothesis 6 was rejected ($\beta = -.115$, $p > .05$), implying that there is no significant relationship between the number of board meetings and the sustainability score. The last two hypotheses were related to the size and composition of the sustainability committee. Hypothesis 7, which suggested that the university's sustainability level would increase along with an increase in the number of sustainability committee members, was accepted ($\beta = .453$, $p < .001$). Finally, Hypothesis

TABLE 4 Descriptive statistics for the research variables.

Variables	N	Mean	Std deviation
Control variables			
Profitability	153	-5.578	9.932
Net cash flow	153	9.1364	6.323
Big 4	153	0.667	0.473
Membership of Russell Group	153	0.157	0.364
University age	153	1.971	0.357
Total assets (log)	153	5.479	0.520
Independent variables			
Board size	153	21.595	3.500
% of female members on the board	153	37.954	9.378
% of external members on the board	153	57.908	10.140
% of student members on the board	153	7.339	3.162
% of academic members on the board	153	13.117	5.870
Number of board meetings	153	5.105	1.577
Number of members in the sustainability department	153	7.680	6.646
% of female members in the sustainability department	153	34.686	24.162

8 was also supported, which means that increasing the percentage of female members on the board is significantly and positively linked to an increase in the sustainability score ($\beta = .298, p < .001$).

6.2 | Results and discussion

The relationship between various board characteristics of the UK universities and the universities' sustainability scores was examined. We found that the larger the university's board, the better its sustainability score. Such a result is consistent with those results given in Chams & García-Blandón, 2019 and Tran et al., 2021. This result implies that increasing the number of directors in a university council enhances its sustainability performance. As the resource dependency theory reminds us, increasing the number of principals would bring a number of improvements to a university's sustainability as larger boards provide the university with the needed networks to enhance its sustainability involvement (Hu & Loh, 2018). It would also reduce the scope of the agency problem and increase the university's resources; this relies on the idea that increasing the number of board members enhances its monitoring capability (Koufopoulos et al., 2020). In other words, a larger board would allow the recruitment of knowledge experts from different backgrounds who would be utilized in dealing with different sustainability issues.

Our findings also sustained the existence of a significant positive relationship between the number of students on the board and the university's sustainability score. This result aligns with the idea that students' evaluation of sustainability assists a university's management in conducting better sustainability initiatives (Nejati & Nejati, 2013). This is also supported by the propositions of the stakeholder theory, in that it is generally assumed that students are able to present innovative ideas for improving a university's performance, as they are considered one of the major groups of stakeholders for HEIs. Likewise, increasing the number of academics on university councils has been recorded to have a significant and positive effect on the sustainability score for HEIs in the UK. Expectedly, and based on the resource dependency theory, having academic members on the board enhances the ability of a university's management to deal with issues related to society and the environment, as those members

TABLE 5 Hierarchical regression analysis for sustainability.

	Step 1		Step 2		
Variables	<i>B</i>	Sig.	<i>B</i>	Sig.	VIF
Control variables					
Profitability	−0.081	0.435	0.142	0.108	1.943
Net cash flow	−0.079	0.428	−0.084	0.296	1.601
Big 4	0.038	0.651	−0.099	0.152	1.199
Membership of Russell Group	0.065	0.546	0.101	0.260	2.025
University age	−0.049	0.571	−0.005	0.937	1.203
Total assets	0.079	0.458	−0.157	0.079	1.998
Independent variables					
Board size			0.180	0.011*	1.235
% of female members on the board			0.059	0.393	1.207
% of external members on the board			0.048	0.501	1.263
% of student members on the board			0.135	0.044*	1.116
% of academic members on the board			0.144	0.042*	1.243
Number of board meetings			−0.115	0.080	1.079
Number of members in the sustainability department			0.453	0.000***	1.451
% of female members in the sustainability department			0.298	0.000***	1.390
<i>F</i>	1.147		8.166***		
<i>R</i> ²	.045 (.006)		.453 (.398)		
Δ <i>R</i> ²	.045		.408		
<i>F</i> for Δ <i>R</i> ²	–		12.870***		

Note: Adjusted R^2 is given in parentheses.

* $p < .05$; ** $p < .01$; *** $p < .001$.

have the knowledge and experience required to enhance the university's sustainability. Such a finding is in line with Cho et al. (2017), who reported a positive relationship between the existence of university professors on the board and CSR performance.

Moreover, the relationships between the structure and composition of the university's sustainability committee and sustainability score are among our main findings, as this relationship was not addressed in the previous literature. Our analysis has shown the existence of a positive relationship between the number of sustainability committee members and the sustainability score of the university. Gender diversity in these departments was also proven to have a positive effect on universities' sustainability. These results could be explained by the arguments of the stakeholder theory, where the higher the number of sustainability committee members, and the higher the number of female members, the better the experience provided to a university needing to improve its sustainability. This is due to the idea that the sustainability committee is expected to provide recommendations to the management that help in adopting activities that serve the benefits of the stakeholders (Valle et al., 2019). Furthermore, the resource dependency theory suggests that the sustainability committee helps the institution to have the required resources to achieve better sustainable development (Umar, 2020). The results obtained in the analysis should provoke particular reflection on the creation of sustainable development departments and committees at universities aiming to ensure that universities are protecting the community. This is also supported by the results of prior work,

for example, Elmghaamez et al. (2023) reported a positive relationship between sustainability committee and ESG disclosure. Endrikat et al. (2021) found a positive effect of CSR committee on a company's CSR.

Regarding the relationships between the other board characteristics (number of female directors on the board, number of external members, and number of board meetings) and sustainability score, our results concluded that they were non-significant. Despite the fact that, among the universities included in the analysis in the current study, more than 50% of board members were external members (which is in line with the recommendation of the Higgs Report, 2003), our results did not support the existence of a significant relationship between the number of external members and sustainability. Such a result aligns with Shahbaz et al. (2020), who found that increasing the number of non-executive directors is not significantly linked with a company's commitment to CSR. This implies that their presence has no significant impact on a university's sustainability score, which could be because they are from outside the institution, and hence do not consider sustainability issues as much as internal directors do. The latter is an important issue where HEIs should better employ knowledge exchange with external members, and where possible, take advantage of their experience within their institutions to enhance existing sustainability practices. This finding also implies that the argument of the agency theory regarding the effectiveness of external members in promoting a university's sustainability is less applicable when it comes to the higher education sector in the UK; the reason could be that the effectiveness of the monitoring role of such members is linked to the financial performance evaluation, and therefore, the independent member may choose to focus on enhancing institutions' financial performance more than the social performance (e.g., Majeed et al., 2015). Similarly, the lack of a significant relationship between the number of board meetings and sustainability indicates that the number of board meetings does not enhance board's effectiveness in promoting the sustainability of a university. This could be explained by the fact that board meetings are linked with poor financial performance, implying that boards tend to meet after reporting bad financial performance to discuss how to improve it; furthermore, it was reported that board meeting results in having more expenses (i.e., high energy cost and travelling costs) that may affect the performance of the company, which implies that boards may avoid increasing the number of board meetings to minimize such costs (see, for example, Ting et al., 2018). Moreover, the non-significant relationship between the number of female directors and sustainability signifies that the proposition of the resource dependency theory that female members will provide the board with the knowledge and experience needed to enhance sustainability is less relevant in the higher education sector in the UK. The reason could be that female directors tend to imitate independent directors in their monitoring actions, which aligns with our empirical findings (e.g., Buallay et al., 2022).

7 | SUMMARY AND CONCLUSION

This is the first study that aims to examine the relationship between board characteristics and sustainability score of the HEIs in the UK. To comprehensively examine such a relationship, we included the following board characteristics: board size, board gender diversity, board independence, student members, academic members, size of the sustainability committee, and gender diversity of the sustainability committee, as some of these characteristics, such as the size of the sustainability committee and gender diversity of such a committee, were not included in prior literature. The data related to sustainability score were collected from the People and Planet (2019) website, while financial data were collected from the HESA website, and board characteristics were collected from the universities' annual reports and websites.

Our analysis revealed that having larger boards of HEIs enhances the level of sustainability score. Furthermore, we found that the higher the number of students and academics on the boards the higher the sustainability score. Sustainability committee size and composition were also recorded to have a significant positive effect on universities' sustainability score. While, board gender diversity, the number of external members on the board, and the number of board meetings held during the year were not found to have a significant relationship with sustainability score.

7.1 | Implications for practice

In light of the data analysis results, several recommendations emerge for universities aiming to enhance their sustainability scores. These suggestions stem from the observed positive and significant relationships between independent variables and the sustainability scores of universities. First, the presence of a positive correlation between board size and sustainability score suggests that HEIs are advised to augment the number of board members. This augmentation is poised to furnish institutions with a broader spectrum of information and ideas conducive to their sustainability goal. Second, our results indicate that universities could consider including both student and academic members among their directors. Having students as board members has a positive impact on a university's sustainability score because they can assess sustainability-related issues from different perspectives, as they have different viewpoints and ideas. Likewise, academic board members have an analytical view of certain issues; they are more critical in their judgements and thoughts about sustainability. Third, it is recommended that universities consider including a sustainability committee in their management structure, as such committees can undertake activities that help to improve the overall sustainability of the university. Fourth, our analysis underscores the importance of fostering interdisciplinary collaboration within universities. The data reveal a positive correlation between interdisciplinary research initiatives and higher sustainability scores. Therefore, it is advisable for universities to encourage and facilitate collaboration across diverse academic disciplines. This approach not only enhances research outcomes but also contributes significantly to addressing complex sustainability challenges through a holistic and multifaceted perspective.

7.2 | Limitations and future research

While this work has contributed valuable insights and recommendations for HEIs seeking to improve their sustainability scores, this section addresses the study's limitations, which can be viewed as opportunities for future research. First, the sample did not encompass all UK HEIs; the sample size was constrained by the availability of online rankings of sustainable universities created by People & Planet. Future research could delve into these relationships using a more extensive sample and may consider a cross-country examination. Second, the data were limited to 2019, which also resulted from the limits on the availability of university sustainability rankings and board characteristics data. Future research may span several years, and hence carry out a longitudinal study, which would allow the comparison of the results over several years in order to indicate any trends that universities displayed in the field of sustainability. Third, the current study examined the relationships between a number of characteristics of university management and sustainability based on the availability of the data; however, there are other dimensions that could be included, specifically those related to the diversity of boards of directors, such as cultural diversity and educational diversity. The data for such dimensions could be collected by conducting individual interviews or surveys with representatives of the boards of individual universities. Finally, our study examined the relationship between board characteristics and the overall sustainability score, hence future research could examine the impact of board characteristics on the individual components of sustainability, such as carbon emissions, ethical careers, education, energy sources, and recycling.

AUTHOR CONTRIBUTIONS

Tamer K. Darwish: Conceptualization; supervision; writing – review and editing; writing – original draft. **Doaa Aly:** Methodology; conceptualization; resources; data curation; software; writing – original draft. **Muath Abdelqader:** Conceptualization; methodology; formal analysis; writing – original draft. **Anna Toporkiewicz:** Software; formal analysis; validation; data curation. **Ali Radwan:** Writing – review and editing; conceptualization.

CONFLICT OF INTEREST STATEMENT

The authors declare no financial or non-financial interests that are directly or indirectly related to this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHICS STATEMENT

Informed consent was obtained from all individual participants included in the study.

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