

This is the Author's accepted manuscript version of the following contribution published by Taylor & Francis:

What combined diversity conditions of board directors lead to financial sustainability? A fuzzy set qualitative comparative analysis of Italian universities / Rotondo, F.; Giovanelli, L.; Marinò, L.; Fadda, N.. - In: STUDIES IN HIGHER EDUCATION. - ISSN 1470-174X. - (2022).

The publisher's version is available at:

<https://dx.doi.org/10.1080/03075079.2022.2061445>

When citing, please refer to the published version.



What combined diversity conditions of board directors lead to financial sustainability? A fuzzy set qualitative comparative analysis of Italian universities

Journal:	<i>Studies in Higher Education</i>
Manuscript ID	CSHE-2020-1708.R2
Manuscript Type:	Article
Keywords:	board of directors, diversity, performance, Italian Higher Education System (IHES), fsQCA

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Manuscripts

What combined diversity conditions of board directors lead to financial sustainability? A fuzzy set qualitative comparative analysis of Italian universities

Although recent reforms of higher education (HE) across Europe have involved reconfigurations of internal governance structures, little research has been conducted on the characteristics and practices of governing bodies and their impact on performance. In particular, more empirical evidence is required on the composition of the board of directors, whose role and responsibilities in strategy making and monitoring of university activities have been significantly strengthened. This paper focuses on the issue of diversity in board composition, which has gained increasing attention in the corporate literature but has largely been ignored in HE. Since most studies of diversity in HE have been fragmented, a configurational approach is followed to examine the combinations of diversity of directors that lead to high board performance in universities. Drawing from the literature and considering the characteristics of university governance, four conditions are identified: age, gender, educational background and provenance. The method of fuzzy set qualitative comparative analysis (fsQCA) is used to investigate the cases of 18 medium-sized state universities of Italy. The analysis revealed that no single condition is necessary or sufficient, while there are two paths that lead to board effectiveness: low educational background diversity and high provenance diversity combined with high age diversity, and low educational background diversity and high provenance diversity combined with low gender diversity.

Keywords: board of directors, diversity, performance, Italian Higher Education System (IHES), fsQCA

Introduction

In many European countries, recent reforms of higher education (HE), which were inspired by New Public Management (NPM) principles, aimed at improving the accountability, controls and performance of universities, in line with their transformation towards more autonomous, entrepreneurially-oriented and competitive organizations (Krücken and Meier 2006). The processes of organizational

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3 transformation have mainly involved reconfigurations of internal governance structures
4 and, in particular, the introduction or reinforcement of the role and responsibilities of
5 boards of directors (Kretec, Dragšić, and Kehm 2013). However, little research has been
6 conducted to examine the characteristics and practices of university boards as well as
7 their impact on performance (De Silva Lokuwaduge and Armstrong 2015). In particular,
8 the issue of diversity in board composition, i.e., the inclusion of a compositional
9 difference of people defined by demographic, ethnic, cultural and socioeconomic
10 criteria, has largely been ignored. In general, evidence has been provided for the
11 positive impact of board diversity on decision making, monitoring and responsiveness
12 (Letendre 2004). Otherwise, although there is general agreement on the importance of
13 diversity for achieving universities' primary mission of providing a high-quality
14 education (American Council on Education 2012), the study of diversity has been
15 fragmented. This fragmentation is because diversity has mainly been assessed at
16 student, staff and system levels by focusing on gender, ethnicity or socio-economic
17 conditions discretely, without integrating these different facets within the overall
18 concept.

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40 This paper aims to examine board performance by following a 'configurational
41 approach', which sees outcomes as the result of a combination of different conditions. It
42 extends the research line based on the impact of intersectionalities of difference such as
43 gender, class and ethnicism of academics, to directors of university boards. In
44 particular, it intends to answer the following research question: what combinations of
45 diversity conditions of board members lead to high board performance? Drawing from
46 the literature and considering the characteristics of university governance, four
47 conditions – age, gender, educational background and provenance of directors – are
48 considered to assess board diversity in medium-sized state universities of Italy. The
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3 method of fuzzy set qualitative comparative analysis (fsQCA) (Ragin 2008) is used to
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5 find out the paths that explain high board performance.
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9 **Literature review**

10 *University board and diversity*

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12 In the last two decades, most European countries have carried out profound HE reforms
13 that, following the dictates of NPM, have been aimed at changing modes of steering and
14 control at all levels of HE systems (De Boer, Enders, and Leisyte 2007). As regards the
15 internal governance structure of universities, the authority relationships between
16 governing bodies have been reshaped to reflect the transformation of universities from
17 ‘incomplete organizations to more complete organizations’ (Brunsson and Sahlin-
18 Andersson 2000), increasingly similar to corporate-like organizations (Krücken and
19 Meier 2006).
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33 Despite the differences between countries, university boards have been seen as
34 the building block of the reconfiguration of university governance structures around the
35 world (Kretec, Dragšić, and Kehm 2013). According to the corporate governance
36 literature, from the agency theory perspective the board of directors is first a key value-
37 protection device through which managers’ behaviour is monitored to ensure that they
38 do not extract private benefits from their role (Hermalin and Weisbach 2001). From the
39 resource-dependence view, it is also a value-creation device, as it provides valuable
40 resources that help a firm to gain a competitive advantage (Bertoni, Meoli, and Vismara
41 2014). The stewardship theory, deemed to be the most relevant governance theory in the
42 university context (Dixon and Coy 2007), explains that board responsibilities include
43 setting strategic aims, implementing the strategies and providing the leadership.
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3 Thus far, there are a few studies that have investigated the practices and roles of
4 actors in university governance. Buckland (2004), in line with the classic principal-
5 agent approach, studied the evolution of UK universities' governing boards after the
6 prescriptions of the Lambert Model Code of Governance. Dixon and Coy (2007)
7 examined the process of annual reporting in New Zealand's universities to explore the
8 role of members of governing bodies. Shattock (2013) analysed the governance and
9 management models of the pre- and post-1992 UK universities. De Silva Lokuwaduge
10 and Armstrong (2015) assessed the influence of governance structures on performance
11 in Australian government-funded universities after the introduction of the Australian
12 National Governance Protocols in 2004. In particular, they focused on the impact of
13 board size, board independence and board committees on performance, and found that
14 boards dominated by internal members have a higher impact on teaching and research
15 performance. Sherer and Zakaria (2018) evaluated the factors affecting the
16 representation of females on governing bodies of UK universities, observing that
17 although the proportion of female members of UK university boards is higher than the
18 corporate sector, it still remains unsatisfactory since it does not reflect the percentage of
19 female staff and students.
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42 To date, except for these studies, in the HE literature very little attention has
43 been paid to diversity in board composition. In general, diversity in personal and
44 professional traits of its members provides the board with a wider pool of resources and
45 expertise, prevents 'group-think' (European Commission 2011) and stimulates
46 innovation, all of which are key elements to improving decision-making (Letendre
47 2004). Board diversity, in fact, is associated with higher creativity and the possibility to
48 consider a broader set of alternatives, which lead to the generation of new ideas
49 (Nielsen and Huse 2010). Furthermore, diversity of members enhances a firm's
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3 responsiveness to different categories of stakeholders, such as employees, customers,
4 suppliers and media (Hillman 2015), as well as independence of thought and critical
5 inquiry, thereby improving the monitoring function, which is one of the main tasks of
6 the board. Ultimately, more discussion, more monitoring and more challenges in the
7 boardroom are associated with more diversity, which includes different personal
8 aspects, such as age and gender (European Commission 2013), cultural aspects, such as
9 nationality and ethnicity (Luo 2005), and professional aspects, such as education and
10 career path (European Commission 2011).

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12 In the last decade, the issue of diversity has also gained momentum in HE,
13 following the idea that diversity in student bodies, faculties and staff is important for
14 universities to fulfil their primary mission. Diversity of backgrounds and perspectives
15 enriches the educational experience and, by challenging stereotypical preconceptions,
16 promotes personal growth and a healthy society. In addition, by fostering mutual
17 respect, it strengthens communities and the workplace, and also enhances competition,
18 since it identifies and uses the talents and abilities of all individuals (American Council
19 on Education 2012). Consequently, the discourse of diversity registers powerfully in the
20 language of universities (Bowl 2018). Many studies have analysed how gender diversity
21 contributes to students' enrolment (Conger and Dickson 2017; Chang and ChangTzeng
22 2020), learning and experiences (Yang et al. 2017; Bradbury-Jones et al. 2020). A
23 smaller number of studies have explored ethnic gaps in order to assess the relative
24 importance of educational and socioeconomic factors (Meehan, Pacheco, and Pushon
25 2019) and explain students' learning gaps; others have focused on socioeconomic
26 diversity to assess the effects of mixed-study environments on learning outcomes
27 (Adrianzén et al. 2019).

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3 A vast literature has focused on the relationship between staff diversity,
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5 especially regarding gender and race, and different outcomes. A number of studies have
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7 assessed the impact of gender diversity on staff outcomes and experiences (van Mens-
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9 Verhulst, Woertman, and Tadtke 2015; Nielsen 2016, 2017) as well as faculty
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11 members' activities (Guarino and Borden 2017) and career path (Goy et al. 2018;
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13 Tiainen and Berki 2019). Deem (2003) found that gender power relations, expectations
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15 and discrimination affect careers and organizational experiences of female manager-
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17 academics. Van den Brink et al. (2010) showed that bounded transparency and limited
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19 accountability of academic recruitment and selection hindered gender equality, whereas
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21 Leisyte and Hosch-Dayican (2014) found that the changing teaching-research nexus in
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23 the Netherlands is likely to be negatively related to the career prospects of female
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25 academics. Bhopal (2014) examined the experiences of black and minority ethnic
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27 academics finding, among others, that women felt that in order to negotiate their
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29 professional roles as senior leaders they had to exhibit a particular persona typified by
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31 high levels of professionalism. In addition, race diversity has also been used to explore
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33 the relationship between teachers and students (Hart 2020).
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40 However, except for a small body of research that has shed light on
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42 demographics and career paths, such as gender, age, race, experience, educational
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44 background and provenance of university deans (Lavigne 2019, 2020; Bobe and Kober
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46 2020), there is a paucity of research on the individual characteristics of members of
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48 governing bodies and, particularly, on the impact of diversity on governing bodies'
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50 performance. Furthermore, to date the approach to diversity in HE has been fragmented,
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52 as a gap exists in the integration of the different aspects that should be included in the
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54 concept. In this regard, in the HE diversity literature, it is worth mentioning a stream of
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56 research concerning the impact of intersectionality, i.e., how differences of gender,
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3 class, ethnicism and race influence the behaviour and career of academics, particularly
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5 among those in senior leadership roles (Bhopal 2014).
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9 ***University governance in Italy***

11 The current Italian Higher Education System (IHES) is the result of several changes
12 (Donina, Meoli, and Paleari 2015) that, beginning in the late 1980s and inspired by the
13 neo-managerial framework, have been directed towards improving efficiency and
14 quality by increasing competition among state universities (Glennester 1991). In the
15 2010s, performance-based funding was gradually introduced for resource allocation
16 (Ministerial Decree n. 815/2014) (Fadda et al. 2021). Total funds are now divided in a
17 basic share (50%), a reward share (27%) and other interventions (23%). In turn, the
18 basic share is based on historical expenditure (27%) and the so-called ‘standard cost per
19 student’ (23%), which is a price mechanism that links funding to a university’s ability to
20 attract students (Ministerial Decree n. 289/2021). The standard cost per student
21 represents an ideal cost with which universities must align to adequately educate
22 students. The reward share is assigned on the basis of research quality (80%) and a
23 performance contracting mechanism, since the Ministry and each university agree upon
24 a set of objectives (20%). It is important to point out that profitability is not a key goal
25 for state universities, which are required to maintain a long-term balance between costs
26 and revenue, while providing high-quality services. Similarly, Decree n. 49/2000
27 introduced a reward mechanism, which replaced the traditional input-based approach
28 (Agasisti and Pérez-Esparrells 2010), to quantify the annual staff recruitment budget for
29 each university. Two financial indicators are used to identify best performers (which
30 will receive a bigger annual budget) and worst performers: personnel costs, which
31 represent the main indicator of cost efficiency since it must not exceed 80% of total
32 revenue, and the economic and financial sustainability index (ISEF), which is the ratio
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3 between total revenues after reducing rents payable and personnel expenses plus
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5 amortization charges.
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8 In general, the governance structure of state universities has passed from a
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10 centralistic model, based on a legitimacy derived from political power (Royal Decree
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12 No. 1592, 1933), to a model based on self-government that grants more power to the
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14 academic elite (Law No. 168, 1989). In particular, the so-called Gelmini Reform (Law
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16 No. 240/2010), in line with the most recent international trends (Riccaboni and Galgani
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18 2010), promoted the transition to a board-based model.
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21 In the new governance model, a key role is played by the rector, whose power has
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23 been reinforced. He/she is still elected from among all full professors by the whole
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25 academic body, administrative staff and students, but his/her mandate has been extended
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27 from three to six years and is now not renewable, which means greater autonomy since
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29 he/she no longer has to appease a future electorate. Furthermore, the rector exerts a
30
31 dominant influence in the appointment of board directors and the general director (Donina
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33 and Paleari 2019). The executive power is balanced by the Academic Senate, whose role,
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35 however, has been reduced to that of a consultative body on scientific issues, no longer
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37 representative of all the faculties (Donina and Paleari 2019). The members of the
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39 Academic Senate can either be elected or directly hold this position as a consequence of
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41 other offices (for example, being department heads). Conversely, the importance of the
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43 board has increased as it has been given financial responsibility for university activity.
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45 The board's tasks include strategic direction and planning and control over financial,
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47 administrative and asset operations. The board also supervises the financial sustainability
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49 of the university. In order to increase independence and tackle self-referencing, the board
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51 must also be composed of external members. In general, board members are elected or
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53 chosen from candidates either with proven skills in the management field or with a high
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3 level of professional experience with specific attention to scientific and cultural
4 qualifications. Law no. 240/2010 prescribes that universities set out in their statutes how
5 and how many directors are appointed on the board. An analysis of all 68 state
6 universities' statutes reveals three main appointment models. In the most common model,
7 the Academic Senate chooses both internal members (among those who decided to apply)
8 and external members (among those proposed by the rector after a selection of candidates
9 who decided to apply). In the second model, the external members are directly chosen by
10 the rector after a selection of candidates who decided to apply, whereas the internal
11 members are chosen by the Academic Senate or elected by the academic community. In
12 the third model, both internal and external members are directly appointed by the rector.
13 The rector is always a board member and almost always acts as a chair.

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The governance structure includes three other bodies: an evaluating body, which
is mainly entrusted with verifying the quality and effectiveness of the educational offer
and research activities; a board of auditors, which is in charge of controlling
administrative tasks and accounting regularity; and a general manager, who is often
external to the administration and responsible for the overall management and
organization of the university.

Diversity conditions of board directors

In the following sub-sections, the attributes used to assess the diversity of board
directors will be examined, in order to explain why they are important to understand
board performance in the IHES.

Age

Directors with different ages have collections of practical knowledge, skills and trade
practices that make them adequately equipped to address a broad spectrum of concerns
confronting an organization. Older directors are negatively related to firm risk (Kim and

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3 Lim 2010; Mathew, Ibrahim, and Archbold 2016) and dividend payouts (Tahir, Masri,
4 and Rahman 2020); younger directors are more likely to undertake strategic change
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6 (Ahn and Walker 2007). Badu (2013) identified a positive but insignificant association
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8 between directors' age and profitability, while Platt and Platt (2012) observed that firms
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10 with older directors are less likely to go bankrupt. Herrmann and Datta (2005), with
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12 reference to top-management teams, revealed that lower age is positively associated
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14 with international diversification. Since it is not clear whether young or old is
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16 necessarily 'better' for board outcomes, a number of studies have highlighted the
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18 importance of age diversity among board members. Mahadeo, Soobaroyen, and
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20 Hanuman (2012) found a positive impact of age diversity on firm performance due to
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22 the synergies between the productivity provided by younger board members and the
23
24 experience contributed by the older members. Cumming and Leung (2021) found that in
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26 male-dominated industries, age diversity facilitates innovation (measured by patent
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28 numbers), although it results in lower quality patents. Fernández-Temprano
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30 and Tejerina-Gaite (2020) revealed that, in Spanish non-financial firms, age diversity
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32 has a positive effect on firm performance, whereas Ullah et al. (2020) found that, in
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34 Chinese listed firms, age diversity improves firms' investment efficiency. However,
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36 Talavera, Yin, and Zhang (2018) found that in the Chinese banking sector, board age
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38 diversity is negatively associated with bank profitability. In addition, Khan, Khan, and
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40 Senturk (2019) revealed in the context of Pakistani listed firms a negative effect of age
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42 diversity on corporate social responsibility (CSR) disclosure, similar to findings of Post,
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44 Rahman, and Rubow (2011). Such mixed empirical evidence suggests that age diversity
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46 matters in different ways depending on geographic and industry context. In the
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48 university setting, considering age diversity is important as a proxy of the presence of
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50 different academic ranks as well as students sitting on the board.
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Gender

Gender diversity has received most attention in the corporate governance literature. Women bring different views and problem-solving skills, which improve decision-making at the board level (Daily and Dalton 2003). Furthermore, their different experiences, networking and socialization skills can connect firms to female customers and other stakeholders, with positive effects on investment efficiency (Ullah et al. 2020) and financial performance (Liu, Wei, and Xie 2014; Assenga, Aly, and Hussainey 2018). Interestingly, Bouthckova et al. (2020) suggest a spillover effect of board gender diversity: the experience gained by male directors of working with female directors on other boards enables female directors to contribute more effectively in terms of attendance, CEO accountability and risk-taking. Similarly, Mathew, Ibrahim, and Archbold (2016) and Bhat et al. (2020) showed that the presence of female directors reduces corporate risk. Several studies have underpinned the importance of gender diversity for CSR (Deschênes et al. 2015; Shaukat, Qiu, and Trojanowski 2016; Sundarasan, Je-Yen, and Rajangam 2016; Kyaw, Olugbode, and Petracci 2017; Azam, Khalid, and Zia 2019; Khan, Khan, and Senturk 2019; Joubert 2021).

However, empirical results for the relationship between the presence of women on boards and firm performance are controversial (Joecks, Pull, and Vetter 2013). Adams and Ferreira (2009), for instance, showed that although boards with more female directors are characterized by tougher monitoring, more incentive alignment and potentially greater participation by directors in decision-making, the relation between gender diversity and performance appears to be negative. This is probably due to the fact that the more dissimilar directors are, the more they could disagree, causing more conflict. Sanan (2019) found a negative effect of the proportion of female directors on dividend payout in Indian firms. Valuable insights into the gender-performance

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3 relationship was provided by Arena et al. (2015), who considered the ‘critical mass’ of
4 women directors. They showed that when a certain threshold of women in a group is
5 reached, the nature of group interactions change as women can bring their different
6 abilities and skills to the board with an incremental benefit on firm performance. This
7 finding is supported by Elmagrhi et al. (2018), who observed a negative relationship
8 between gender diversity and capital structure in UK charities, but only up to the point
9 of having three women sitting on board. It is also shown by Duppatti, Scrimgeour, and
10 Sune (2019), who examined the effects of board characteristics on performance of firms
11 listed on Ireland and Spanish stock exchanges. They found that while female
12 representation had significant effects on performance for the Spanish firms, for the Irish
13 companies the relationship was negative, consistent with the critical mass theory. In
14 fact, in Irish firms, women directors are likely to face tokenism because of their small
15 number, which makes them the sole representative of their group characteristic.
16 Otherwise, Campbell and Mínguez-Vera (2008) demonstrated that a woman’s presence
17 in the boardroom of Spanish listed firms, per se, does not affect the value of a company.

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Ultimately, the influence of women as a group on firm performance is differential across countries and industries. In HE, because of the small percentage of female board appointments, it appears to be very important to understand whether and to what extent gender diversity affects board performance.

Educational background

Other than gender and age, which are usually defined as relation-oriented attributes, there is growing attention paid to the task-oriented attributes of board diversity, i.e., tenure and education. In line with the human capital theory (Johnson, Schnatterly, and Hill 2013), educational background refers to knowledge, capabilities and skills acquired

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3 through education, which can improve the execution of a director's tasks leading to
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5 increased firm performance (Barroso, Villegas, and Pérez 2011).
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8 However, most studies have assessed these attributes in terms of level of
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10 education, showing contradictory results. In fact, different levels of education among
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12 board members were found to significantly promote CSR activities (Azam, Khalid, and
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14 Zia 2019; Joubert 2021) or reduce corporate risk (Bhat et al. 2020). However, Boadi and
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16 Osarfo (2019) revealed that board members with a first degree have a significant
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18 positive impact on performance of Ghanaian banks, while the opposite is the case for
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20 board members with Doctor of Philosophy (PhD). Conversely, Arena et al. (2015)
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22 found that the educational level of women directors negatively affects firm
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24 performance, as it might impact the dynamics within the boardroom. The literature has
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26 highlighted that diversity of educational background is positively related to both
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28 task/cognitive and relationship conflicts, which negatively affect group cohesiveness
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30 and thus firm performance (Petrovic 2008).
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36 Fernández-Temprano and Tejerina-Gaite (2020) found that educational diversity
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38 seems to have a negative effect on performance for supervisory directors, probably
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40 because of a segmented working environment where social barriers exist between
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42 groups with different backgrounds. The findings of Assenga, Aly, and Hussainey (2018)
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44 do not support an association between financial performance and PhD qualification of
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46 directors.
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50 A number of studies have considered educational background along with
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52 educational level. Educational background diversity improves directors' ability to
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54 generate and share new insights (Barroso-Castro, Villegas-Periñan, and Dominguez
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56 2017) and improves strategic decision-making (Clark and Maggitti 2012). Ullah et al.
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58 (2020) showed that task-oriented diversity, including attributes such as education level
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3 and expertise of a board (measured with five categories: financial, consulting, legal,
4 management and other expertise) improves firms' investment efficiency. Al-Matari
5 (2019) found a significant positive relationship between accounting experience of top
6 executive team members and corporate performance. Chen and Moers (2018) reported
7 an increasing demand for directors with financial and business expertise, also due to
8 recent corporate governance reforms. These directors bring expertise and knowledge to
9 the board as a result of their experience in strategic decision-making in other firms and
10 also serve to build legitimacy for the firm (Hillman, Cannella, and Paetzold 2000).
11 Cumming and Leung (2021), other than the level of education, considered directors'
12 experience in science and business to assess their impact on corporate innovation. They
13 found, among other things, that scientific experience matters in high-tech and patent
14 intensive industries. Khan, Khan, and Senturk (2019) found that neither educational
15 level nor educational background diversity (measured with six categories: HR and
16 accountancy, banking and finance, economics, engineering, law and others) are
17 significant drivers of the quality of CSR disclosure.

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Ultimately, the value of educational background diversity depends on the industry in which the firm operates and the dependent variable. In universities, the assessment of the impact of this type of diversity on performance is even more important considering the limited experience of academics in directorships, the variety of disciplinary fields they are involved in and the kind of responsibilities discharged by the board.

Provenance

Due to the specific characteristics of the context under investigation, provenance diversity, in terms of both place of birth and place of work, was preferred over independence, race, ethnicity and nationality. In the IHES, a director's provenance is a

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3 better proxy of independence than the insider/outsider dichotomy. First, all inside
4 directors, such as rectors, professors, administrative employees and students, have a
5 personal interest in the university in which they operate. Second, outside directors
6 coming from the same area in which the university is located are often not truly
7 independent, since they usually present some type of affiliation with the university
8 itself, such as having earned a qualification from that university or holding positions
9 such as teaching contracts or professional consultancies. Therefore, the board is
10 presumed to be proportionally more independent as the number of directors coming
11 from different regions of the country increases.
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24 In general, following the resource dependence theory, outside directors bring
25 key resources to the firm, such as information, skills, access to key constituents and
26 legitimacy (Hillman, Cannella, and Paetzold 2000). However, the outcomes deriving
27 from the appointment of this type of director are not univocal (Bozec, 2005). Some
28 studies have reported positive effects of board independence on financial performance
29 (Duppati, Scrimgeour, and Sune 2019), financial disclosure (Torchia and Calabrò
30 2016), CSR (Deschênes et al. 2015) and foreign investments (Banerjee, Oriani, and
31 Peruffo 2019). Other have assessed a negative effect of independence on CSR
32 (Sundarasan, Je-Yen, and Rajangam 2016) and dividend payout (Sanan 2019), as well
33 as no relationship (Assenga, Aly, and Hussainey 2018) or, at most, a non-linear
34 relationship (Merendino and Melville 2019), with financial performance or cost
35 efficiency (Titova 2016). Interestingly, some recent studies have found that the value of
36 independent directors differs across corporate conditions (Joh and Jung 2018) and
37 countries (Duppati, Scrimgeour, and Sune 2019).
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56 Furthermore, since all members of Italian medium-sized state university boards
57 are Italian and Caucasian, provenance from different regions of the country was
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3 preferred over race, ethnicity and nationality. As the competition among Italian
4
5 universities increases, as well as the number of directors coming from other regions of
6
7 the country, it is imperative to examine and understand the impact of directors with
8
9 different provenance on board performance.
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12 In general, nationality and ethnic diversities were found to bring different
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14 cognitive perspectives and priorities on corporate ultimate objectives into board
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16 discussion and decision-making, in turn influencing firm outcomes (Johnson,
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18 Schnatterly, and Hill 2013). Although empirical evidence on such outcomes is
19
20 inconclusive (Carter et al. 2010), prior literature largely supports a positive effect of
21
22 national diversity in a boardroom in terms of firm performance (Delis et al. 2017;
23
24 Fernández-Temprano and Tejerina-Gaite 2020) and CSR disclosure (Ibrahim and
25
26 Hanefah 2016; Khan, Khan, and Senturk 2019). Harjoto, Laksmana, and Yang (2019)
27
28 measured educational background diversity in terms of the countries in which directors
29
30 obtained their undergraduate and graduate degrees, finding a positive relationship
31
32 between this type of diversity and corporate social performance. However, the
33
34 appointment of directors from other ethnic groups, measured by the percentage of
35
36 foreign directors, was found to have either positive (Macaulay et al. 2018) or negative
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38 effects (Azam, Khalid, and Zia 2019) on socially responsible corporate activities,
39
40 whereas Vairavan and Zhang (2020) showed neither direct nor indirect effects of board
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42 racial diversity on firm performance.
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50 **Methodology**

51 ***Operationalization of conditions and board performance***

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53 To explore which combinations of diversity conditions of board members lead to high
54
55 board performance, we adopted fsQCA (Ragin 2008). Before calibrating conditions and
56
57 board performance (as required by fsQCA and explained in the method section), the
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3 four conditions of diversity of board directors (age, gender, educational background and
4
5 provenance) and board performance were operationalized as detailed below.
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8 Age diversity was measured by the standard deviation of directors' age.
9

10 Gender diversity was measured as a percentage of directors of the predominant
11
12 gender among total directors. Since the lowest value was higher than 50% at a sample
13
14 level (UNIURB with 54.54%), the lower the percentage, the more diversified the board.
15

16
17 Educational background diversity was measured as a percentage of the number of
18
19 different field of studies/diplomas among total directors.
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21 Provenance diversity was measured as a percentage of the number of the different
22
23 Italian regions the board directors come from on total directors. Provenance was
24
25 considered diverse if a director came from a different region in terms of both place of
26
27 birth and place of work.
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30 Table 1 summarizes the indicators used to measure each condition and the main
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32 references.
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35 Table 1 near here
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37 The board of directors' performance was considered as a multidimensional
38
39 concept. We decided to build a balanced overall performance indicator, by combining
40
41 absolute indicators (based on average values) and relative indicators (based on changes
42
43 over time), both of which are important in terms of measuring board performance, since
44
45 they have different meanings and together contribute to a more comprehensive
46
47 understanding of performance. In line with the financial responsibilities assigned to the
48
49 board of universities by the Italian legislation, three different measures were used. As a
50
51 proxy of a board's ability to increase state funding by attracting students, the first
52
53 measure was the algebraic sum of the annual variation in students enrolled in the first
54
55 year for the period between the academic years 2015/2016 and 2018/2019. As a proxy
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3 of a board's ability to generate revenue, the second measure was the ratio of total
4
5 operating revenue to teaching staff units, on average, over the period 2015–2018. As a
6
7 proxy of a board's ability to keep costs under control, the third measure was the ratio of
8
9 personnel costs, which represent the highest costs on a university's income statement, to
10
11 total operating revenue, on average, over the period 2015–2018.
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15 Table 2 summarizes the values of the indicators adopted to measure each
16
17 diversity condition and board performance.
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20 Table 2 near here

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22 Finally, three robustness checks were carried out using different measures of
23
24 board performance. The first robustness check was performed by replacing absolute
25
26 indicators of the overall performance with relative indicators in order to grasp a
27
28 university's ability to make improvements. In particular, a different version of total
29
30 operating revenue per staff unit and the ratio of personnel costs to total operating
31
32 revenue was adopted. The first indicator is now measured as the algebraic sum of the
33
34 annual variation of the ratio of total operating revenue to teaching staff units during the
35
36 period 2015–2018, while the second constitutes the algebraic sum of the annual
37
38 variation of the ratio of personnel costs to total operating revenue during the period
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40 2015–2018. The second and third robustness checks adopted a unique indicator to
41
42 measure the board performance, which was profit/loss calculated as the average value
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44 over the period 2015-2018 and cost per student calculated as the algebraic sum of the
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46 annual variation of the ratio of total operating costs to total students, enrolled in 2015-
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48 2018.
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54 55 ***Case selection and data collection***

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57 Among the 99 Italian universities, we chose to focus on state universities, which differ
58
59 substantially from private universities in terms of funding mechanism, accounting
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3 system and organization. In particular, to increase the level of homogeneity between
4 cases, we selected all the 18 state universities that fall within the ‘medium-sized’
5 universities category (Censis classification), that is, those with between 10,000 and
6 20,000 students enrolled (Table 3).
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12 In case selection, we ensured that the state universities were located in different
13 areas of Italy; the most similar different outcome (MSDO) method was applied to
14 analyse cases with a similar pattern of conditions and differences in outcome so that a
15 balanced number of successful and unsuccessful boards of directors were represented
16 (in relation to our definition of performance, which is reported below). Finally, the
17 number of cases under investigation permitted us to analyse board composition and
18 functioning in detail, whilst also providing sufficient variety among the cases (Ragin
19 2008).
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30 To analyse cases and acquire information on each board of directors, a
31 biographical analysis of directors was completed to trace their identity and
32 characteristics. In particular, data were collected from members’ curricula vitae and
33 board documents available on the official university websites. To deal with any lack of
34 disclosure, online research was conducted to gather additional information, for instance
35 from business-oriented social networks such as LinkedIn. Data on board outcomes were
36 collected from two different sources: the Ministry of Education, University and
37 Research database (USTAT), through which information on enrolled students and
38 teaching staff units was gathered, and the annual reports of universities for financial
39 information.
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53 Finally, a qualitative approach was followed to increase the study’s validity and
54 substantiate the findings. Semi-structured interviews were conducted with eight
55 directors, two for each university included in the three configurations showing high
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3 board performance (UNIBG, UNICZ, UNITN, UNISS), to provide evidence for the
4
5 paths suggested by the study. The selection of participants was based on judgemental
6
7 sampling. In keeping with the thematic analysis approach (Braun and Clarke 2006), the
8
9 diversity conditions were used as themes whose value and relations with board
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11 performance the interviewees were asked to comment on.
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15 Table 3 near here
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18 *Method*

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20 The fsQCA method is a case-based method which combines qualitative and quantitative
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22 approaches. It is especially appropriate for investigating causal complexity of multiple
23
24 conditions leading to an outcome, without isolating the effects of individual variables
25
26 (Ragin 2008). It takes the configurational approach, analysing each case as a
27
28 configuration of conditions that jointly lead to an outcome. This allows study of
29
30 equifinality as it permits exploration of different combinations of conditions that result in
31
32 certain outcomes (Fiss 2007, 2011). It has been largely used in the social sciences
33
34 (Verweij et al. 2013) and less so in HE studies (Snelson-Powell, Grosvold, and Millington
35
36 2016) to analyse conjunctural causal patterns among small- or medium-n cases ranging
37
38 from 10 to 50 (Schneider and Wagemann 2012).
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44 The fsQCA method considers conditions and outcomes as sets, which are a sort
45
46 of ‘data container’ defined in terms of “boundaries that outline zones of inclusion and
47
48 exclusion by which concepts are described” (Schneider and Wagemann 2012 p. 24). It
49
50 is a type of QCA in which set membership scores range from ordinal to continuous
51
52 values (Fiss 2007). We decided to use fsQCA in the light of our theoretical
53
54 fundamentals and having observed the presence of features (conditions and outcome)
55
56 throughout our cases (each university is a case). In fact, in our study the extent of each
57
58 condition and board performance were observed as low or high and not present/absent.
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3 Differently from crisp set qualitative comparative analysis (csQCA), fsQCA addresses
4 the way cases vary in the degree to which they belong to sets (Ragin 2000).
5
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7
8 Set membership scores are assigned by an assessment process called calibration
9 that deals with defining whether or not a case belongs to a set (Schneider and
10 Wagemann 2012). Therefore, after the case analysis and the operationalization of
11 conditions and performance, we carried out the calibration process. This is a sort of
12 indicators' translation adopting a different unit of measurement that allows researchers
13 to differently express indicators on the basis of their set membership by means of
14 threshold values. The calibration process consists of weighting each condition and
15 performance on a scale of set membership scores ranging from 0.00 (full non-
16 membership, indicating 'fully out' of the set) to 1.00 (full membership, indicating 'fully
17 in' the set).
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30 The calibration process in fsQCA can follow a four-way basis (with values of 0,
31 .33, .67, and 1) or a three-way basis. We adopted this second approach to calibrate the
32 four conditions and the overall performance indicator with values of 0, .5 and 1,
33 following the 'direct method' and using the fsQCA software (Ragin 2008).
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40 Therefore, cases of directors have degrees of membership within a certain set,
41 ranging from 0.00 (full non-membership) to 1.00 (full membership). Average
42 membership values of all members of a certain board were used to set final scores for
43 each condition. Table 4 summarizes threshold values of each diversity condition and
44 board performance. Table 4 summarizes threshold values of each diversity condition and
45 board performance.
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51 Table 4 near here
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53 The four diversity conditions, as well as the overall performance indicator, were
54 then calibrated in line with the threshold values.
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3 Regarding performance indicators, after the calibration of each performance
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5 measure, membership scores were summed and a new calibration was performed based
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7 on the sum of the values. Table 5 shows performance indicators calibrated and the
8
9 overall performance of the 18 cases.
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12 Table 5 near here
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15 The calibration and assessment of the membership scores of each condition and
16
17 performance for all the cases analysed is summarized in a raw data matrix (see Table 6).
18
19 After that, the membership scores were translated into dichotomized values (Ragin
20
21 2017), which are exhibited in the truth table (see Table 7) using the analytical software
22
23 fsQCA 3.0. The truth table is the main tool of the analysis, with the goal to identify
24
25 connections between combinations of causal conditions and outcome. It lists all
26
27 logically possible configurations or combinations of causal conditions that lead to the
28
29 outcome and shows the cases that exhibit each configuration.
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31

32
33 Causal relationships are recognized after analysing the necessity and sufficiency
34
35 of a condition or a configuration (which is a combination of conditions) in producing
36
37 the outcome. A condition or a configuration is necessary if the outcome cannot occur
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39 without it, while it is defined as sufficient when it leads to the outcome either by itself
40
41 or with the help of other conditions (Schneider and Wagemann 2012).
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45 The analysis of the results consists of first examining the necessity of each
46
47 condition and second assessing the sufficiency of all logically possible configurations
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49 that lead to the outcome. This is achieved through the truth table. Subsequently, a
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51 Boolean minimization process is applied (Ragin 2017), which simplifies combinations
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53 and minimizes solutions by using an algorithm. This results in three different types of
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55 solutions: complex, intermediate and parsimonious (Ragin 2008). The solutions show
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57 the condition or the configuration, which is termed the 'path' that leads to an outcome.
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3 Therefore, paths deal with different combinations of conditions, also called
4
5 ‘configurations’, that simultaneously lead to the outcome. A solution can show more
6
7 than one path. This approach allows the assessment of the equifinality that refers to a
8
9 situation where “a final result can be achieved from different initial conditions and by a
10
11 variety of different paths” (Fiss 2007).
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15 Following previous studies, we used the complex solution, which is the most
16
17 conservative and which in our research was also equivalent to the intermediate solution.
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19 We also adopted the parsimonious solution as is deemed good practice (Schneider and
20
21 Wagemann 2010; Verweij et al. 2013). This is a streamlined presentation of the results
22
23 showing only those conditions with the strongest empirical support in terms of relation
24
25 to the outcome (Ragin 2008).
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29 The robustness of solutions is evaluated through consistency and coverage
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31 measurement in the analysis of causes and causal relationships. Consistency measures
32
33 the degree to which cases that share a given combination of conditions, in terms of both
34
35 sufficiency and necessity, also share the same outcome. A consistency close to 1 means
36
37 a high validity of the identified causal combinations (Raab, Mannak, and Cambrè 2015).
38
39 Coverage expresses the relative empirical relevance of cases to the outcome, i.e., how
40
41 the cases are distributed across these configurations (Ragin 2008). It gauges the
42
43 reliability of the results (Rihoux and Ragin 2009). Furthermore, in the solution, for each
44
45 causal path there is a consistency score and two coverage scores. Raw coverage
46
47 measures how much of the outcome is explained by that causal combination overall,
48
49 while unique coverage measures how much of the outcome is explained exclusively by
50
51 that causal combination and is obtained by subtracting the other raw coverage measures
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53 from the solution coverage (the entirety of what can be covered by any other path)
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58 (Schneider and Wagemann 2012).
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Results

Core findings

The scores of the four conditions and the outcomes obtained through the calibration process for all 18 cases are presented in the raw data matrix in Table 6.

First, the analysis of the necessity of each condition was conducted. Since no consistency score of the four conditions exceeded the threshold of 0.9 (Schneider and Wagemann 2012), no necessary condition was identified. This means that the outcome does not occur in the presence of any specific condition. Consistency values for the four conditions were as follows: age 0.70, gender 0.51, educational background 0.51, provenance 0.70.

Second, the analysis of the sufficiency of the conditions was based on the truth table. Of the 16 possible configurations of the 18 cases, 11 were found to lead to the outcome and five logical remainders were not. These latter are the logically possible configurations that are not covered by the cases.

After setting the consistency cut-off at 0.8, above the minimum recommended threshold of 0.75 (see, e.g., Ragin 2008; Fiss 2011), three configurations were coded 1 in the outcome column, as shown in Table 7. The following eight configurations were coded 0 based on the consistency values. Therefore, the analysis of the truth table revealed that three different combinations of conditions (configurations) lead to a high university board performance. The other eight configurations shown in the table exhibit a low level of consistency, even if they are related to the outcome. This means that although they are covered by cases, they are less consistent with the outcome and so not statistically important in explaining the university board performance.

The three configurations with a high performance, which are covered by four cases (UNIBG, UNICZ, UNITN, UNISS), were included in the minimization process.

We then derived the complex solution, the most conservative approach, which coincided with the intermediate solution and revealed two paths that lead to high university board performance (Table 8). The parsimonious solution revealed a single path. The different paths obtained in our solutions show that a high board performance can be achieved through different ways, consistent with different combinations of conditions.

Table 6 near here

Table 7 near here

Table 8 near here

The configurations for high board performance extracted from the complex solution are:

A (age) * $\sim B$ (educational background) * P (provenance) + $\sim G$ (gender) * $\sim B$ (educational background) * P (provenance) \Rightarrow HIGH BOARD PERFORMANCE

The * sign indicates the logical operator 'AND', the + sign indicates the logical operator 'OR' and the sign \sim indicates the logical operator 'NOT'.

The first causal path suggests that university boards characterized by high age diversity combined with low educational background diversity and high provenance diversity explain high performance. The second path suggests that university boards characterized by low gender diversity combined with low educational background diversity and high provenance diversity explain high performance.

The overall solution coverage was 0.60, showing that these two paths explain 60% of all high board performance. The solution consistency was 0.88, indicating that 88% of the university boards with the two configurations were effective.

Lower scores of raw coverage and unique coverage have been observed in the second path. The higher raw coverage suggests that the first path is more important

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3 from an empirical perspective. Furthermore, the low unique coverage indicates a
4 significant overlap in the conditions that lead to the outcome. Therefore, the first path
5 exhibits less overlapping in conditions.
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10 The two configurations found in the complex solution are not mutually
11 exclusive, as one case (UNISS) is present in both. In the first path, which includes three
12 cases (UNIBG, UNICZ, UNISS), three conditions – age, low educational background
13 and provenance – can be interpreted as INUS conditions (Schneider and Wagemann
14 2012). This means that all the three conditions are an insufficient but necessary part of
15 an unnecessary but sufficient configuration that leads to the outcome. The second path,
16 which includes two cases (UNITN, UNISS), identifies three INUS conditions, namely
17 low gender, low educational background and provenance.
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28 Configurations that lead to board performance ineffectiveness were also
29 investigated. Of the 16 logically possible configurations, 11 were found to lead to the
30 outcome, while five logical remainders were not covered by the cases. Four
31 configurations, involving six cases (UNINAOR, UNIMC, UNINAPA, UNIVAQ,
32 UNIPM, UNISI), showed a highly consistent combination of conditions and low
33 performance, while seven configurations, even if leading to the outcome, showed a low
34 level of consistency. Table A in the Appendix shows the complex and parsimonious
35 solutions. The complex and intermediate solutions coincided and returned two paths:
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$$46 \quad A * \sim B * \sim P + G * B * P > \text{LOW BOARD PERFORMANCE}$$

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49 Comparing these solutions with the core analysis (configurations that explain
50 effectiveness), the consistency scores are almost the same (0.91, 0.91 versus 0.88, 0.83)
51 whereas the solution coverage scores are slightly lower (0.59, 0.61 versus 0.60, 0.64).
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54 These scores mean that the paths leading to effectiveness indicate higher reliability and
55 explain the outcome more clearly than those leading to ineffectiveness. Furthermore, the
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3 lower scores of raw coverage, observed in the case of the configurations leading to
4 board ineffectiveness, suggest that the paths leading to board effectiveness are more
5 important from an empirical perspective.
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10 11 ***Robustness checks*** 12

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14 Three robustness checks were conducted using different indicators to measure board
15 performance.
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18 The first robustness check, which uses a different version of the overall
19 performance indicator, revealed that four different combinations of conditions lead to
20 high board performance and are covered by six cases (UNISS, UNITN, UNIBS,
21 UNITS, UNIBG and UNICZ). All the cases (four out of six high performers of the new
22 analysis) that the original analysis presented as being high performers are included. The
23 complex solution revealed that three paths lead to high board performance while the
24 parsimonious solution revealed two paths.
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34 Comparing these results with those of the original analysis, it appears that path 1
35 of the complex solution and path 2 of the parsimonious solution are the same. This
36 means that when using measures based on changes over time our results are confirmed
37 to a good extent. However, the coverage and consistency scores are lower than those of
38 the original analysis.
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46 In the second and third robustness checks, profit/loss and cost per student were
47 considered separately to measure board performance. When the board performance was
48 measured by the profit/loss indicator, the paths found were almost the same as our
49 original analysis (same path 1 and slightly different path 2 of the complex solution, and
50 same path 1 of the parsimonious solution). The new findings reveal that the cases with
51 high performance are exactly the same as the core analysis (four out of four high
52 performers in the new analysis). When the board performance was measured by cost per
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3 student more paths were found in addition to some of our previous solutions. In fact, as
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5 in the core analysis and the previous robustness check, we found the paths $A^* \sim B^*P$ and
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7 $\sim B^*P$ of the complex and parsimonious solutions, respectively. The new findings still
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9 include all the cases that the original analysis showed to be high performers (four out of
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11 eight high performers in the new analysis). The coverage and consistency scores of the
12
13 two new robustness checks are lower (the first) or slightly higher (the second) than
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15 those of the core analysis. In summary, the three robustness checks corroborate our core
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17 findings.
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23 **Discussion and conclusion**

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25 This paper aimed to examine which combinations of diversity in university
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27 boards, in terms of age, gender, educational background and provenance of
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29 directors, are conducive to high board performance. The analysis revealed neither
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31 necessary nor sufficient conditions and a number of INUS conditions or multiple
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33 configurations that seem to lead to high board performance. In particular, two
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35 paths toward high performance were extracted from the complex solution,
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37 whereas a single path emerged from the parsimonious solution. These findings are
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39 now interpreted through a qualitative enrichment of the study based on case
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41 evidence and interviews.
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46 First, we focus on what was revealed by the parsimonious solution, namely that
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48 effective boards require members with not-diversified educational backgrounds and
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50 diversified provenance. This means that having on the board academics and
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52 practitioners from different fields does not turn into better decision-making, which is
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54 probably due to increased complexity in using a common language and finding a
55
56 common ground when discussing issues and making decisions. In line with Petrovic
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58 (2008) and Arena et al. (2015), when board members have different educational
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3 backgrounds, they are more likely to experience differences in the ways that they
4 perceive and respond to the issues they confront on the board. These differences are
5 likely to lead to a relationship conflict, which determines tension, annoyance and
6 animosity among directors and can negatively affect the firm performance.
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12 The composition of the boards of the effective cases suggests another important
13 way to interpret this finding. Whereas qualifications or field of studies of directors
14 sitting on the boards of UNIBG, UNICZ, UNISS and UNITN are less than 50%
15 diversified on average, educational backgrounds are strongly concentrated in the field of
16 law and economics, which concerns 52.27% of these directors on average (compared
17 with 38.60% of directors of the rest of the sample).
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26 This circumstance highlights the resource dependence role of this type of
27 directors, who provide a university with essential knowledge and professionalism in
28 management, administrative operations and decision making (Hillman, Cannella, and
29 Paetzold 2000).
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35 In this regard, an interviewee claimed:

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38 “The presence of academics and practitioners from the fields of economics and management
39 represents a guarantee for the financial viability of a university. These directors bring resources in
40 terms of balance sheet knowledge and correctness of investments. Furthermore, academics and
41 practitioners from the field of law permit the board to take good decisions in terms of legitimacy”.

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47 This point was also highlighted by another interviewee, who argued:

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50 “Directors with a background in law facilitate the interpretation of rules and allow the board to
51 exert tighter control over procedures and documents prepared by the university offices”.

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3 This finding also supports the principle that the resources brought by directors
4 must be aligned with the context and the functions assigned to the board to make a
5 difference (Cumming and Leung 2021).
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10 As regards provenance diversity, although it is very low at a sample level
11 (13.62%), the regions from which board directors of UNIBG, UNICZ, UNISS and
12 UNITN come from are different for almost 20% on average. Since provenance is
13 assessed considering both place of birth and place of work, this type of diversity
14 increases with the number of outside members. Therefore, this finding supports the idea
15 behind reforms inspired by 'good governance' principles (Buckland 2004), namely that
16 appointing people from commercial and industrial organizations as board members is
17 the key to effective control and governance. The reason may be two-fold. First, in line
18 with the resource-dependence view, outside directors, because of their knowledge and
19 background, can provide the board with unique information, skills and relationships,
20 which help a university to maintain a competitive edge (Bertoni, Meoli, and Vismara
21 2014). Second, a diverse provenance of directors of university boards can also be
22 associated with more independence, which fosters control over the board activities and
23 enhances performance (Duppati, Scrimgeour, and Sune 2019). In fact, all inside
24 directors are obviously non-independent whereas outside directors from the same region
25 in which a university is located are often not truly independent.
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47 These reasons are well explained by an interviewee, who argued:

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50 "I think that non-belonging to university context is associated to higher independence of directors.
51 In addition, outside directors bring a broader vision and knowledge in different fields, which
52 permit the board to go beyond localism when making decisions".
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57 Such a finding is not in contrast with De Silva Lokuwaduge and Armstrong
58 (2015), who found that boards dominated by inside members rather than independent
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ones have a better influence on performance in terms of teaching and research results. Rather, it confirms that the value of board independence differs across countries and industry conditions (Joh and Jung 2018; Duppati, Scrimgeour, and Sune 2019), in line with different tasks assigned to the board. The current study focuses on university financial performance, the planning and supervision of which in the IHES fall within the competence of the board, while a different body (the Academic Senate) has been assigned the responsibility of teaching and research management and results.

The complex solution revealed two configurations that lead to high performance. In the first path, low educational background diversity and high provenance diversity combine with high age diversity. The positive effect of having people with diverse ages on the board in universities can be explained through case analysis. At first glance, age diversity could be explained by a high presence of students sitting on the board. This would account for better integration of the perspectives of one of the main end users of university services (Lozano 2020), therefore improving the delivery of tailored and high-quality services. In reality, the composition of the boards of UNIBG, UNICZ and UNISS shows, on average, a lower presence of students than other universities (16.29% vs. 18.80%). The main cause of diversity is related to a better representation of academics of different ages (standard deviation equal to 8.13 vs. 7.30 of others), which indirectly accounts for different academic ranks within the boards. Consequently, it seems that the generational debate among academics on the board improves decision-making. In line with what was found by Mahadeo, Soobaroyen, and Hanuman (2012), age diversity generates synergies that impact on board performance, as pointed out by a director:

“The combination of experience with the dynamism and fresh ideas brought by new generations help the board finding effective and innovative solutions”.

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3 This concept was also supported by another director, who argued:
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6 “Age diversity, which is a proxy of academic rank diversity, is useful for making better informed
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8 decisions as all interests, needs and issues of the academic community are considered”.
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11 However, three interviewees pointed out that, due to IHES characteristics,
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13 board directors belonging to lower academic ranks suffer from higher
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15 conditioning from higher ranks, which affects their decision-making autonomy.
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18 In the second path, low educational background diversity and high provenance
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20 diversity combine with low gender diversity. In general, our study confirms a gender
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22 imbalance on the governing bodies of Italian medium-sized state universities, as found
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24 by Sherer and Zakaria (2018) in UK universities, since male members are about 69% of
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26 total directors and male gender is predominant across the sample. In particular, in the
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28 two successful cases, i.e., UNISS and UNITN, the gender gap is higher than that of the
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30 rest of the sample on average (73.86% vs. 68.33% of male directors on the board).
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32 Multiple reasons contribute to explain why low gender diversity is related to high
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34 performance of boards. As suggested by Adams and Ferreira (2009), this finding might
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36 reveal greater cohesion and less conflict among members due to gender similarities in
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38 interpreting and coping with decision problems. Second, it might reveal that, in such a
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40 context, the experience gained by male directors of working with female directors on
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42 other boards is very low, which prevents female directors from contributing more
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44 effectively (Boutchkova et al. 2020). A third reason could be the low total number of
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46 women directors sitting on the board (2.5 on average in the two successful cases), which
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48 does not permit them to reach the ‘critical mass’ they need to add value by bringing new
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50 ideas and different perspectives to the table (Arena et al. 2015).
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57 As regards the unfamiliarity of working with women directors, an interviewee
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59 said:
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3 “The difficulty of collaborating is a historical heritage. In the IHES, the first appointments of
4 women on the board have represented a significant change in the governance structure of
5 universities”.
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10 Four interviewed directors attested that a cultural problem is still present, which
11 is also revealed by the use of language that diminishes the role of women in the
12 governing bodies of universities.
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16 Most of the interviewees pointed out the importance of reaching a ‘critical mass’
17 by women directors to fully provide distinctive resources such as resolving conflict and
18 paying more attention to social issues. In this regard, an interviewed director argued:
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23 “The low number of women directors contributes to put them in subjection, at least at an
24 unconscious level. I think that the reason for the poor presence of women sitting on the board and,
25 in general, in the governing bodies of universities, is related to the low percentage of women
26 among the full professors in the IHES”.
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33 Finally, such a finding might just reveal that, in such a context, other diversity
34 variables, such as a ‘law and economics’ background and diversified provenance,
35 prevail over gender in determining high board performance. This justifies the
36 configurational approach behind this research, since the concept of diversity has many
37 facets that have to be considered together. This finding also confirms that, in general,
38 the effects of gender imbalance depend on context and need more investigation (Nielsen
39 2016; Guarino and Borden 2017).
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49 From a theoretical point of view, this study contributes to filling the research gap
50 in the impact of the individual characteristics of members of the governing bodies of
51 universities. In particular, it extends the value of intersectionality to university board
52 performance, which is seen as the result of an interplay of different diversity attributes.
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59 The findings also support resource dependence theory by arguing that expertise,
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3 professionalism and independence matter to board performance, but also reveal that
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5 diversity conditions affecting board members vary depending on context characteristics
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7 and tasks assigned to the board.
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10 These results have important implications for policymakers and university
11 management, who must go beyond the application of the ‘one-size-fits-all’ approach in
12 the composition of a board and understand what combinations of diversity attributes can
13 enhance overall board performance. In Italy, for instance, much more attention should
14 be paid to the appointment of academics with different ranks and ages, as well as
15 independent outside directors and female directors, who are currently far from reaching
16 the ‘critical mass’ required to provide an effective contribution.
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19 However, this paper has a number of limitations. First, the findings are not
20 exhaustive: the solution coverage scores of both the complex and parsimonious
21 solutions (0.60 and 0.64, respectively) mean that our set-theoretic connection accounts
22 for about two-thirds of the outcome. However, it is important to point out that these
23 solution coverage scores are in line with (Snelson-Powell, Grosvold, and Millington
24 2016; Wang 2016; Fadda and Rotondo 2020) or higher than (Fiss 2011) those of
25 previous studies. The addition of cases or conditions could influence the performance of
26 boards. First, the analysis could be extended to universities of different sizes or
27 replicated in different national systems. Second, diversity in terms of members’ time
28 availability and level of independence could be included in future research. In relation
29 to other HE systems, ethnicity and internationality could also be evaluated.
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46 Appendix

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Reviewer(s)' Comments to Author:**Referee: 1****Comments to the Author**

The authors have profoundly addressed the reviewer comments. I recommend publication.

Response: We would like to thank Referee 1 for the constructive comments which greatly helped us improve the paper.

Referee: 2**Comments to the Author**

The paper deals with a very interesting topic; as an outcome of reforms, the role of university boards has been strengthened, but there is limited evidence on whether their composition affects performance. The approach focusing on multiple dimensions of diversity is relevant and the literature review is quite helpful.

The revision was professionally made and especially the addition of qualitative evidence is helpful to substantiate results. Also, clarifying that the dependent dimension is financial sustainability was helpful, I'd suggest including financial sustainability already in the title for sake of clarity.

Answer to the reviewer and action: Thank you for your appreciation. As suggested by both referees, in the first revision of the manuscript we clarified that the dependent variable is board performance better. In particular, we pointed out that, in Italy, a recent reform has reinforced the boards' role by giving them financial responsibility for the whole university activity. In this regard, we agree that the title can be further edited as follows: 'What combined diversity conditions of board directors lead to financial sustainability? A fuzzy set qualitative comparative analysis of Italian universities'.

However, my major issue remains with the robustness of the empirical analysis given the problem of confounding factors and the small number of cases. I do think the empirics requires careful revision and I am providing some advice below.

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3 Answer to the reviewer and action: Thank you for this comment. Although some issues
4 cannot be addressed entirely since fsQCA is a case-based method analysing conjunctural
5 causal patterns in relation to small or medium 'n' cases, we have now added a set of
6 robustness checks, following your directions, to reinforce our empirical analysis (see below
7 for details).
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14 **First, to limit the potential impact of confounding factors, such as subject**
15 **composition, all dependent variables should be based on changes over time. For**
16 **example, both revenues per staff and the share of personnel costs are likely to be**
17 **strongly affected by subject composition and the presence of a medical faculty. It**
18 **could also be argued, the board performance should be measured against the**
19 **previous baseline and the ability to provide improvements.**
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24 Answer to the reviewer and action: This point gave us the opportunity to better explain why
25 we adopted our composite indicator of performance. Absolute indicators (based on
26 average values) and relative indicators (based on changes over time) are both important
27 when measuring board performance, since they have different meanings and jointly
28 contribute to a more comprehensive understanding of performance. In addition, both types
29 of indicators are affected by certain limitations: absolute indicators do not take into account
30 the differences among cases (e.g., subject composition and presence of a medical
31 faculty), while relative indicators do not consider starting conditions. In fact, as we
32 observed in our cases (i.e., this is the case for UNICZ), a university starting with a high-
33 performance rating finds it more difficult to improve its results. It can also be argued that
34 when the baseline is high, slight performance improvements or performance maintenance
35 must be viewed as positive results. For this reason, we decided to build a balanced overall
36 performance indicator by combining absolute indicators (revenues per staff and share of
37 personnel costs) and relative indicators (enrolled students). We have added this
38 explanation in the 'Operationalization of conditions and board performance' sub-section (p.
39 17, lines 17-21).
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52 However, we appreciate your comment and, as suggested, we have now conducted
53 additional analysis adopting different indicators to measure the board performance and
54 test our findings.
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58 In particular, the first robustness check of our results used a different version of indicators
59 2 (revenues per staff) and 3 (share of personnel costs). In order to grasp a university's
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ability to make improvements, the former is measured as the algebraic sum of the annual variation of the ratio of total operating revenue to teaching staff units during the period 2015–2018. The latter is measured as the algebraic sum of the annual variation of the ratio of personnel costs to total operating revenue during the period 2015–2018.

The results of the analysis are reported below. In table 1, the three indicators used to measure board performance and their calibrations are presented, while table 2 shows the threshold values of performance calibration.

Table 1. Board performance.

Performance								
Case	Enrolled students	Total operating revenue on teaching staff units	Personnel costs on total operating revenues	Enrolled students (calibrated)	Total operating revenue on teaching staff units (calibrated)	Personnel costs on total operating revenues (calibrated)	Σ	Overall
UNIPO	0.24	-0.02	-0.02	0.82	0.4	0.5	1.72	0.47
UNIINSUB	0.41	-0.14	0.05	0.97	0.06	0.2	1.23	0.11
UNIBG	0.22	0.07	0.00	0.78	0.8	0.4	1.98	0.72
UNIBS	0.13	-0.08	-0.17	0.58	0.17	0.95	1.7	0.45
UNITN	0.07	0.12	0.00	0.42	0.92	0.4	1.74	0.49
UNIUD	0.07	0.10	-0.01	0.42	0.88	0.45	1.75	0.5
UNITS	0.13	0.04	-0.04	0.58	0.69	0.6	1.87	0.62
UNIURB	0.06	-0.15	0.00	0.39	0.05	0.4	0.84	0.03
UNIPM	-0.02	-0.11	-0.09	0.21	0.1	0.8	1.11	0.07
UNIMC	0.01	0.05	0.00	0.27	0.73	0.4	1.4	0.2
UNISI	0.11	0.06	-0.01	0.53	0.77	0.45	1.75	0.5
UNINAPA	-0.17	0.03	-0.01	0.05	0.65	0.45	1.15	0.08
UNINAOR	0.12	-0.02	-0.15	0.55	0.4	0.93	1.88	0.63
UNIVAQ	0.07	-0.14	-0.05	0.42	0.06	0.65	1.13	0.08
UNIFG	0.35	0.16	-0.07	0.94	0.96	0.73	2.63	0.97
UNISA	0.14	0.09	-0.08	0.61	0.86	0.77	2.24	0.88
UNICZ	0.04	-0.12	0.14	0.34	0.08	0.04	0.46	0.01
UNISS	0.2	0.00	-0.16	0.74	0.5	0.94	2.18	0.85

Table 2. Threshold values

Indicator	Full membership - 1	Crossover point - 0.5	Full non-membership - 0
Board performance			
Enrolled students	0.38	0.1	-0.17
Total operating revenue on teaching staff units	0.15	0	-0.15
Personnel costs on total operating revenues	-0.17	-0.02	0.13
Overall	2.5	1.75	1

Then, table 3 shows the raw data matrix with the new performance indicator. We did not find any necessary conditions (none of the four conditions exceeded the threshold of 0.9. See Schneider and Wagemann 2012).

Table 3. Raw matrix

Case	Conditions				Outcome
	Age	Gender	Background	Provenance	
UNIPO	0.37	0.34	0.80	0.27	0.47
UNIINSUB	0.86	0.34	0.97	0.27	0.11
UNIBG	0.69	0.16	0.06	1.00	0.72
UNIBS	0.46	0.06	0.05	0.27	0.45
UNITN	0.49	0.88	0.13	1.00	0.49
UNIUD	0.9	0.98	0.88	0.12	0.50
UNITS	0.39	0.16	0.06	0.05	0.62
UNIURB	0.25	0.01	0.93	0.05	0.03
UNIPM	0.35	0.99	0.69	1.00	0.07
UNIMC	0.83	0.34	0.32	0.27	0.20
UNISI	0.56	0.79	0.69	1.00	0.50
UNINAPA	0.59	0.98	0.02	0.12	0.08
UNINAOR	0.96	0.05	0.13	0.12	0.63
UNIVAQ	0.47	0.98	0.88	1.00	0.08
UNIFG	0.03	0.01	0.80	0.27	0.97
UNISA	0.67	0.95	0.80	0.27	0.88
UNICZ	0.59	0.12	0.13	0.73	0.01
UNISS	0.63	0.79	0.06	1.00	0.85

Note: A = Age; G = Gender; B = Background; P = Provenance; O = Outcome

After setting the consistency cut-off at 0.75 (the minimum recommended - see Ragin 2008 and Fiss 2011), in the outcome column of the truth table (table 4), four configurations were coded 1, while eight configurations were coded 0 based on the consistency values. The truth table analysis revealed that four different combinations of conditions (configurations) lead to high board performance and are covered by six cases (UNISS, UNITN, UNIBS, UNITS, UNIBG and UNICZ). It was immediately obvious that the new findings still included all the cases that the core analysis had shown to be high performers (these are four out of the six high performers of the new analysis).

Table 4. Truth table

Conditions				Outcome	Consistency	Cases
A	G	B	P	O		
1	1	0	1	1	0.85	UNISS
0	1	0	1	1	0.84	UNITN
0	0	0	0	1	0.82	UNIBS, UNITS
1	0	0	1	1	0.77	UNIBG, UNICZ

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1	1	1	1	0	0	0.71	UNIUD, UNISA
1	0	0	0	0	0	0.67	UNIMC, UNINAOR
1	1	1	1	1	0	0.66	UNISI
0	0	1	0	0	0	0.63	UNIPO, UNIURB, UNIFG
0	1	1	1	1	0	0.63	UNIPM, UNIVAQ
1	1	0	0	0	0	0.60	UNINAPA
1	0	1	0	0	0	0.52	UNIINSUB

Note: A = Age; G = Gender; B = Background; P = Provenance; O = Outcome

The new solutions are shown in table 5. The complex solution revealed three paths that lead to high board performance. The parsimonious solution revealed two paths.

Table 5 Configurations leading to university board effectiveness. Complex and parsimonious solutions from the fsQCA.

	Complex solution			Parsimonious solution	
	Path 1	Path 2	Path 3	Path 1	Path 2
Cases	A*~B*P UNIBG, UNICZ, UNISS	G*~B*P UNITN, UNISS	~A*~G*~B*~P UNIBS, UNITS	~A*~B UNITS, UNIBS, UNITN	~B*P UNIBG, UNISS, UNITN, UNICZ
Raw coverage	0.47	0.38	0.24	0.49	0.52
Unique coverage	0.08	0.02	0.12	0.09	0.13
Consistency	0.78	0.77	0.82	0.76	0.69
	Solution coverage: 0.61			Solution coverage: 0.62	
	Solution consistency: 0.76			Solution consistency: 0.68	

Comparing these results with those of the core analysis, it appears that path 1 of the complex solution and path 2 of the parsimonious solution are the same. This means that when using measures based on changes over time, our results are confirmed to a good extent. However, the coverage and consistency scores are lower than those of the core analysis.

The different meaning of the new measures and the lower scores of coverage and consistency of the new solutions suggest a preference for our previous findings.

However, since we agree that such a robustness check was needed to corroborate our results, we have now added two brief parts in the revised version of the manuscript. The first one has been added at the end of the 'Operationalization of conditions and board performance' sub-section, in which we briefly described the new indicators adopted (p. 18, lines 9-18). Subsequently, in the results, a new sub-section entitled 'robustness checks' has been added, which briefly describes these new findings (this analysis is defined as the first robustness check) (p. 27 lines 7-18).

Second, at least I suggest investigating some other measures of financial performance, such as profit/losses or cost per student. As a minimum, a better

argument on why you use the measures in the paper and whether results are stable to changes in the 'dependent' variables would be needed.

Answer to the reviewer and action: Thank you for this advice. We have both provided a more robust argument as to why these measures are important in the Italian context and have conducted further analysis to assess result stability. From a theoretical point of view, in the 'University governance in Italy' section, we have included additional sentences to explain that the two selected measures are related to the financing and recruitment systems of the Italian higher education system (IHES). In particular, we have pointed out that profitability is not a key goal for state universities, since they are required to maintain a long-term balance between costs and revenue but not necessarily increase profits. In fact, since most of their funds come from the State, high profit could mean that some of those funds are not needed or are not used to improve service standards (p. 7, lines 17-19). Furthermore, it has now been clarified that the share of personnel costs is the main cost indicator used by the State to identify best performers (p. 7, lines 23-24). This is due to the fact that cost per student is associated with resources earmarked for a student's education, therefore, a low value with regard to this indicator may reveal few resources and thus poor quality. As explained more clearly, the standard cost per student, which is set out by the State and used to allocate part of the 'basic share' of funds, is an ideal cost with which universities must align, rather than reduce for the afore-mentioned reason (poor quality) (p. 7, lines 13-15).

That being the case, we have also developed our analyses from a practical point of view, using both suggested financial performance measures (profit/losses and cost per student).

In order to consider both absolute and relative indicators, the profit/loss indicator was calculated as the average value over the period 2015-2018, while cost per student was calculated as the algebraic sum of the annual variation of the ratio of total operating costs to total students enrolled in 2015-2018.

When the board performance is measured by the profit/loss indicator, the paths found are almost the same as our core analysis (same path 1 and slightly different path 2 of the complex solution, and same path 1 of the parsimonious solution) (see table 1 below). The new findings reveal that the cases with high performance are exactly the same as the core analysis (four out of four high performers in the new analysis).

When the board performance was measured by cost per student, more paths were found (see table 2) in addition to some of our core solutions. In fact, as in the core analysis and

the previous robustness check, we found the paths $A^* \sim B^*P$ and $\sim B^*P$ of the complex and parsimonious solutions, respectively. The new findings still include all the cases that the core analysis indicated to be high performers (four out of eight high performers in the new analysis).

The coverage and consistency scores of the two new robustness checks are lower (the first) or slightly higher (the second) than those of the core analysis.

In the end, the investigation of other measures of financial performance also supports our findings.

Table 1 Configurations leading to university board effectiveness

	Profit/loss		
	Complex solution		Parsimonious solution
	<i>Path 1</i>	<i>Path 2</i>	<i>Path 1</i>
Cases	$A^* \sim B^*P$ UNIBG, UNICZ, UNISS	$G^* \sim B^*P$ UNITN, UNISS	$\sim B^*P$ UNIBG, UNISS, UNITN, UNICZ
Raw coverage	0.52	0.44	0.6
Unique coverage	0.13	0.05	0.6
Consistency	0.82	0.84	0.75
	Solution coverage: 0.57		Solution coverage: 0.60
	Solution consistency: 0.80		Solution consistency: 0.75

Table 2 Configurations leading to university board effectiveness

	Cost per student				
	Complex solution			Parsimonious solution	
	<i>Path 1</i>	<i>Path 2</i>	<i>Path 3</i>	<i>Path 1</i>	<i>Path 2</i>
Cases	$\sim G^*B^* \sim P$ UNIURB, UNIFG, UNINSUB, UNIPO	$A^* \sim B^*P$ UNIBG, UNICZ, UNISS	$G^* \sim B^*P$ UNITN, UNISS	$\sim G^*B$ UNIURB, UNIFG, UNINSUB, UNIPO	$\sim B^*P$ UNIBG, UNICZ, UNISS, UNITN
Raw coverage	0.32	0.38	0.3	0.37	0.46
Unique coverage	0.25	0.09	0.03	0.22	0.32
Consistency	0.99	0.96	0.93	0.99	0.92
	Solution coverage: 0.65			Solution coverage: 0.69	
	Solution consistency: 0.96			Solution consistency: 0.94	

Also in this case, in the revised version of the manuscript, we first described these indicators at the end of the 'Operationalization of conditions and board performance' subsection (p. 18, lines 21-25). Then, we added a brief part, in the 'robustness checks' subsection, in which we briefly described these new findings (defined as the second and third robustness checks) (from p. 27 line 19 to p. 28 line 8).

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5 **Third, even your parsimonious solution includes only four cases and the coverage**
6 **is not very satisfactory, are your results robust when dropping one case (for**
7 **example randomly).**
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10 Answer to the reviewer and action: Thank you for these comments. From a methodological
11 point of view, dropping cases is not recommended since our sample, in line with the
12 principle of homogeneity, includes all the Italian medium-sized state universities.
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16 Regarding solution coverage, this refers to the proportion of the cases with the outcome
17 that exhibit a certain casual combination or path (Ragin 2008; Fiss 2007). Thus, the
18 proportion of cases and not the number of cases that covers solutions is important.
19 Although lower coverage scores “indicate considerable elements of randomness or
20 idiosyncrasy within configurations” that lead to the outcome (Fiss 2011, p. 409), the
21 solutions with low coverage scores are substantive and refer to a concrete set of
22 configurations that reliably produce the outcome (Snelson-Powell 2016; Fiss 2011; Garcia-
23 Castro et al. 2013).
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27 However, we had already highlighted as a limitation that the findings were not exhaustive
28 (p. 34, lines 11-14). We have now clarified in the final section of the paper (p. 34, lines 14-
29 17) that the solution coverage scores, found in the complex and parsimonious solutions of
30 our analysis (0.60 and 0.64), are either in line with (Snelson-Powell 2016; Wang 2016;
31 Fadda and Rotondo 2020) or higher than (Fiss, 2011, i.e., 0.36, 0.27) those of previous
32 studies, which have been cited in the revised version of the paper.
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36 **I would argue that some more robustness testing is needed to convince that your**
37 **results are stable enough – you made a good job to show that they are reasonable,**
38 **but I fear this would be possible also for other combinations. Maybe, it would also**
39 **be interesting to look to the paths leading to bad performance.**
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43 Answer to the reviewer and action: Thank you for your suggestion, we agree that the
44 investigation of paths leading to low performance is interesting. Following your comment,
45 we have now analysed these paths and added this part to the paper (final part of the ‘core
46 findings’ sub-section, from p. 26 line 12 to p. 27 line 3). Of the 16 logically possible
47 configurations, 11 were found to lead to the outcome, while five logical remainders were
48 not covered by the cases.
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Four configurations, involving six cases (UNINAOR, UNIMC, UNINAPA, UNIVAQ, UNIPM, UNISI) showed a highly consistent combination of conditions and low performance, while seven configurations, although leading to the outcome, indicated a low level of consistency.

The table below shows the complex and parsimonious solutions.

Configurations leading to university board ineffectiveness. Complex and parsimonious solutions from the fsQCA.

	Complex solution		Parsimonious solution	
	<i>Path 1</i>	<i>Path 2</i>	<i>Path 1</i>	<i>Path 2</i>
Cases	A*~B*~P UNINAOR, UNIMC, UNINAPA	G*B*P UNIVAQ, UNIPM, UNISI	B*P UNIVAQ, UNIPM, UNISI	A*~B*~P UNINAOR, UNIMC, UNINAPA
Raw coverage	0.33	0.34	0.38	0.33
Unique coverage	0.24	0.26	0.28	0.23
Consistency	0.89	0.90	0.91	0.89
	Solution coverage: 0.59 Solution consistency: 0.91		Solution coverage: 0.61 Solution consistency: 0.91	

Both complex and parsimonious solutions revealed two paths each, which are, as expected, different from those of our core analysis.

Complex and intermediate solutions coincided and returned two paths:

$$A * \sim B * \sim P + G * B * P > \text{LOW BOARD PERFORMANCE}$$

Comparing these solutions with our core analysis (configurations that explain effectiveness), the consistency scores are almost the same (0.91, 0.91 versus 0.88, 0.83) whereas the solution coverage scores are slightly lower (0.59, 0.61 versus 0.60, 0.64).

These scores mean that the paths leading to effectiveness show higher reliability and explain the outcome more clearly than those leading to ineffectiveness.

Furthermore, the lower scores of raw coverage, observed for the configurations leading to board ineffectiveness, suggest that the paths leading to board effectiveness are more important from an empirical perspective.

Table 1. Indicators used to measure board diversity conditions.

Conditions	Indicators	References
Age	Standard deviation of directors' age	Mathew, Ibrahim, and Archbold 2016; Talavera, Yin, and Zhang 2018; Khan, Khan, and Senturk 2019; Bhat et al. 2020; Fernández-Temprano and Tejerina-Gaite 2020; Tahir, Masri, and Rahman 2020; Ullah et al. 2020
Gender	Percentage of directors of the predominant gender	Adams and Ferreira 2009; Arena et al. 2015; Shaukat, Qiu, and Trojanowski 2016; Kyaw, Olugbode, and Petracci 2017; Assenga, Aly, and Hussainey 2018; Azam, Khalid, and Zia 2019; Duppati, Scrimgeour, and Sune 2019; Khan, Khan, and Senturk 2019; Bhat et al. 2020; Fernández-Temprano and Tejerina-Gaite 2020; Tahir, Masri, and Rahman 2020; Ullah et al. 2020
Educationl background	Percentage of the number of different fields of study	Hillman, Cannella, and Paetzold 2000; Shaukat, Qiu, and Trojanowski 2016; Al-Matari 2019; Khan, Khan, and Senturk 2019; Ullah et al. 2020
Provenance	Percentage of the number of the different regions the directors come from	Adams and Ferreira 2009; Assenga, Aly, and Hussainey 2018; Azam, Khalid, and Zia 2019; Duppati, Scrimgeour, and Sune 2019; Harjoto et al. 2019; Khan, Khan, and Senturk 2019; Fernández-Temprano and Tejerina-Gaite 2020; Joubert 2021

Table 2. Diversity conditions and board performance.

Case	Conditions				Performance		
	Age	Gender	Educational background	Provenance	Enrolled students	Total operating revenue on teaching staff units	Personnel costs on total operating revenues
UNIPO	13.69	0.67	0.67	0.11	0.24	181,744	0.48
UNIINSUB	17.27	0.67	0.78	0.11	0.41	151,356	0.51
UNIBG	15.72	0.64	0.45	0.18	0.22	150,033	0.50
UNIBS	14.27	0.61	0.44	0.11	0.13	114,790	0.52
UNITN	14.42	0.75	0.50	0.25	0.07	217,193	0.49
UNIUD	17.85	0.80	0.70	0.10	0.07	140,051	0.56
UNITS	13.86	0.64	0.45	0.09	0.13	160,496	0.56
UNIURB	12.83	0.55	0.73	0.09	0.06	116,021	0.59
UNIPM	13.60	0.82	0.64	0.18	-0.02	191,042	0.60
UNIMC	16.92	0.67	0.56	0.11	0.01	121,047	0.62
UNISI	14.85	0.73	0.64	0.18	0.11	128,861	0.59
UNINAPA	15.03	0.80	0.40	0.10	-0.17	159,526	0.53
UNINAOR	19.21	0.60	0.50	0.10	0.12	152,732	0.60
UNIVAQ	14.34	0.80	0.70	0.20	0.07	136,204	0.60
UNIFG	9.26	0.56	0.67	0.11	0.35	170,669	0.57
UNISA	15.57	0.78	0.67	0.11	0.14	161,971	0.64
UNICZ	15.07	0.63	0.50	0.13	0.04	246,543	0.35
UNISS	15.31	0.73	0.45	0.18	0.20	195,878	0.57

Table 3. The selected cases.

No.	University	Abbr.	Enrolled students (2018)	Teaching staff (2018)	Location (Region)
1	Piemonte Orientale	UNIPO	12,653	492	Piedmont
2	Insubria	UNIINSUB	10,703	577	Lombardy
3	Bergamo	UNIBG	19,226	534	Lombardy
4	Brescia	UNIBS	13,962	1248	Lombardy
5	Trento	UNITN	16,603	809	Trentino Alto Adige
6	Udine	UNIUD	14,881	932	Friuli Venezia Giulia
7	Trieste	UNITS	15,300	932	Friuli Venezia Giulia
8	Urbino	UNIURB	14,281	658	Marche
9	Politecnica delle Marche	UNIPM	14,980	713	Marche
10	Macerata	UNIMC	10,213	455	Marche
11	Siena	UNISI	15,818	1315	Tuscany
12	Napoli Parthenope	UNINAPA	11,349	401	Campania
13	Napoli L'Orientale	UNINAOR	11,562	321	Campania
14	L'Aquila	UNIVAQ	15,965	906	Abruzzo
15	Foggia	UNIFG	10,353	409	Apulia
16	Salento	UNISA	17,049	707	Apulia
17	Catanzaro	UNICZ	10,575	412	Calabria
18	Sassari	UNISS	13,295	723	Sardinia

Table 4. Threshold values.

Indicator	Full membership - 1	Crossover point - 0.5	Full non-membership - 0
<i>Diversity conditions</i>			
Age	19	14.50	10
Gender	0.6	0.69	0.78
Educational background	0.76	0.60	0.44
Provenance	0.15	0.12	0.09
<i>Board performance</i>			
Enrolled students	0.38	0.10	-0.17
Total operating revenue on teaching staff units	240,000	180,000	120,000
Personnel costs on total operating revenues	0.38	0.49	0.60
Overall	2	1.20	0.40

Table 5. Board performance (calibrated).

Case	Enrolled students (calibrated)	Total operating revenue on teaching staff units (calibrated)	Personnel costs on total operating revenues (calibrated)	Σ	Overall
UNIPO	0.82	0.52	0.57	1.91	0.93
UNIINSUB	0.97	0.19	0.37	1.53	0.78
UNIBG	0.78	0.18	0.43	1.39	0.67
UNIBS	0.58	0.04	0.31	0.93	0.27
UNITN	0.42	0.87	0.50	1.79	0.90
UNIUD	0.42	0.12	0.13	0.67	0.12
UNITS	0.58	0.27	0.13	0.98	0.30
UNIURB	0.39	0.04	0.06	0.49	0.07
UNIPM	0.21	0.63	0.05	0.89	0.24
UNIMC	0.27	0.05	0.03	0.35	0.04
UNISI	0.53	0.07	0.06	0.66	0.12
UNINAPA	0.05	0.26	0.25	0.56	0.08
UNINAOR	0.55	0.20	0.05	0.80	0.18
UNIVAQ	0.42	0.10	0.05	0.57	0.09
UNIFG	0.94	0.39	0.10	1.43	0.70
UNISA	0.61	0.29	0.02	0.92	0.26
UNICZ	0.34	0.97	0.98	2.29	0.98
UNISS	0.74	0.69	0.10	1.53	0.78

Table 6. Raw data matrix.

Case	Conditions				
	A	G	B	P	O
UNIPO	0.37	0.34	0.80	0.27	0.93
UNIINSUB	0.86	0.34	0.97	0.27	0.78
UNIBG	0.69	0.16	0.06	1.00	0.67
UNIBS	0.46	0.06	0.05	0.27	0.27
UNITN	0.49	0.88	0.13	1.00	0.90
UNIUD	0.9	0.98	0.88	0.12	0.12
UNITS	0.39	0.16	0.06	0.05	0.30
UNIURB	0.25	0.01	0.93	0.05	0.07
UNIPM	0.35	0.99	0.69	1.00	0.24
UNIMC	0.83	0.34	0.32	0.27	0.04
UNISI	0.56	0.79	0.69	1.00	0.12
UNINAPA	0.59	0.98	0.02	0.12	0.08
UNINAOR	0.96	0.05	0.13	0.12	0.18
UNIVAQ	0.47	0.98	0.88	1.00	0.09
UNIFG	0.03	0.01	0.80	0.27	0.70
UNISA	0.67	0.95	0.80	0.27	0.26
UNICZ	0.59	0.12	0.13	0.73	0.98
UNISS	0.63	0.79	0.06	1.00	0.78

Note: A = Age; G = Gender; B = Educational background; P = Provenance; O = Outcome

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Table 7. Truth table.

Conditions			Outcome		Consistency	Cases
A	G	B	P	O		
1	0	0	1	1	0.89	UNIBG, UNICZ
0	1	0	1	1	0.84	UNITN
1	1	0	1	1	0.83	UNISS
1	0	1	0	0	0.78	UNIINSUB
0	0	1	0	0	0.70	UNIPO, UNIURB, UNIFG
0	0	0	0	0	0.68	UNIBS, UNITS
1	1	1	1	0	0.63	UNIUD
0	1	1	1	0	0.58	UNIPM, UNIVAQ
1	1	0	0	0	0.57	UNINAPA
1	1	1	0	0	0.49	UNISI, UNISA
1	0	0	0	0	0.48	UNIMC, UNINAOR

Table 8. Configurations leading to board effectiveness.

	Complex solution		Parsimonious solution
	<i>Path 1</i>	<i>Path 2</i>	<i>Path 1</i>
	$A^* \sim B^* P$	$\sim G^* \sim B^* P$	$\sim B^* P$
Cases	UNIBG, UNICZ, UNISS	UNITN, UNISS	UNIBG, UNISS, UNITN, UNICZ
Raw coverage	0.53	0.43	0.64
Unique coverage	0.17	0.07	0.64
Consistency	0.87	0.85	0.83
	Solution coverage: 0.60		Solution coverage: 0.64
	Solution consistency: 0.88		Solution consistency: 0.83

Table A. Configurations leading to board ineffectiveness. Complex and parsimonious solutions from fsQCA

	Complex solution		Parsimonious solution	
	<i>Path 1</i>	<i>Path 2</i>	<i>Path 1</i>	<i>Path 2</i>
	A*~B*~P	G*B*P	B*P	A*~B*~P
Cases	UNINAOR, UNIMC, UNINAPA	UNIVAQ, UNIPM, UNISI	UNIVAQ, UNIPM, UNISI	UNINAOR, UNIMC, UNINAPA
Raw coverage	0.33	0.34	0.38	0.33
Unique coverage	0.24	0.26	0.28	0.23
Consistency	0.89	0.9	0.91	0.89
	Solution coverage: 0.59		Solution coverage: 0.61	
	Solution consistency: 0.91		Solution consistency: 0.91	

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