DIVERSITY AND COMPETENCE IN BANKS' BOARDS. THE ITALIAN CASE

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ABSTRACT

This study investigates quality and diversity of the individual board members and of the board as a whole in Italian banks. In particular, we focus on the key profiles to assess the level of board diversity, as well as the relationship between quality and diversity taking reference to regulatory prescriptions.

To our best knowledge, this study is among the first to study jointly directors' qualitative characteristics and board composition in banks. In particular it is devoted to appreciate both quality and board heterogeneity and to analyze the relation between them in a regulatory compliance approach.

Results show a positive relationship between different measures of diversity and quality levels of bank's board. Diversity seems to increase as the size of banks increases; boards of directors of mutual banks appear the least diversified and also the ones with the lowest quality score. We point out the relevance of financial skills and experience in defining boards' qualitative profile.

The study provides original and new results, useful not only for the academic discussion, but also for more practical objectives. The main results of the study, in fact, call for an improvement in the composition of banks' boards of directors in the light of the forthcoming regulatory measures as well as for a strengthening in main profiles here individuated, which result to be relevant also for financial Regulators to appreciate board diversity and directors' skills.

Keywords: Corporate Governance, Bank Governance, Board Composition, Board Diversity, Bank Regulation.

1. INTRODUCTION

In recent years regulation on bank governance is becoming more prescriptive than in the past with regards to requirements that single directors and boards as a whole have to meet, also in response to the number of bank crises that have been mainly attributed to shortcomings in governance. Literature has widely investigated corporate governance in banking, embracing numerous approaches, but few studies have adopted the focus taken lately by regulatory bodies to the issue, i.e. looking both at competence and diversity contemporaneously. This study aims at filling in this gap in existing literature by evaluating quality and diversity in banks' board of directors in a comprehensive analysis.

More precisely, this study is not focused on analyzing if and how board heterogeneity and quality are linked to economic performance or risk taking in banks. Accordingly to recent development in regulation, this study concerns on how boards' quality and diversity can be perquisites of good governance, verifying the consistency with actual regulation. The Italian case is taken as a reference for investigation.

The contribution of this paper can be detailed as follows.

Firstly, the study analyzes in depth the level of quality of the board members of a large sample of banks and their diversity. It is among the first to analyze quality and proposes an original measure of quality, based on a variety of factors, both related to the competence profile of directors and boards; more specifically this study is based not only on demographic data, but also on other information, such as experience and time dedication. Additionally, different diversity measures are tested on the sample. According to our best knowledge, this is among the first studies to analyze diversity in boards from different perspectives.

Secondly, departing from most of previous literature and taking an innovative view, the paper investigates a link between quality of board members and different measures of diversity employed.

Third, considering a highly representative sample made of banks representing over 86% of the Italian banking system, the study also tests the level of compliance of a banking system to regulation on board composition.

The main results show that several banks appear to have an adequate level of skill and diversity in their boardroom, although showing some difficulties in adapting to the latest bank corporate governance standards and forthcoming regulatory provisions. Additionally, diversity and quality are positively correlated and in particular financial skills and experience condition boards' qualitative level.

The paper is organized as follows: the second paragraph reviews the relevant theoretical and empirical literature; the third presents the institutional framework; the fourth illustrates the sample object of empirical analysis, the methodology used and discusses the results; the last one concludes.

2. LITERATURE REVIEW

Board composition, expertise and diversity are widely investigated by a vast literature on corporate governance. Assumptions and empirical results are often independent of the firms' industrial sector and, as a consequence, are at least partially suitable for the banking industry. However, as known, banks remain still "special" almost due to their specific regulation on governance (Armour et al. 2016; Hopt 2013).

The economic literature on governance, is "homogeneous" and quite consolidated in the methodology employed to test board diversity. We recall main results of this stream of literature, and then propose an original approach consisting, first, in linking together quality and heterogeneity and, secondly, analyzing different definitions and measures of diversity (see paragraph 4). Our main research item is to check the consistency of bank regulation objectives, in that banks' board quality and heterogeneity are objectives *per se* in improving good governance (see paragraph 3).

First of all, most literature on governance focuses on board composition. Very few are, instead, studies on qualitative level of board members.

Starting from diversity, in literature it is generally referred to two main aspects, gender and racial diversity (Burke 1997; Carter et al. 2003; Erhardt et al. 2003; Ferreira 2010; Miller and Del Carmen Triana 2009). In some studies, however, diversity is also considered as the presence of specific types of directors, such as politicians or politically appointed members, rather than academics or independent directors. Many studies have analyzed the relationship between board composition and firm performance, but results are ambiguous and not definitively clear. As reported by Brickley et al. (1994), Coles et al. (2008) and Weisbach (1988) find a positive relationship between the weight of independent directors and the firm value. Conversely, other empirical studies see no relationship between the proportion of independent directors and the Tobin's Q (Baysinger and Butler 1985; Hermalin and Weisbach 1991), or even a negative relationship (Agrawal and Knoeber 1996; Yermack 1996). The majority of these studies suggests a "partial" view of diversity in the meaning of the presence of particular types of directors. The benefits usually highlighted in relation to this consist in positive connections that directors bring to the company and the "positive"

value linked to their behavior. This is expected to have a social impact on company's employees and its customers.

Literature based on surveys on US firms analyzes the presence of representatives of ethnic minorities or gender, as a broad social "signal", also linked to corporate social responsibility indicators (Bear et al. 2010), or in a key managerial and commercial meaning, whether related to the role of the board as "advisor" to management. Directors, therefore, lead relations and a long term vision that can be useful in implementing business strategies. In this sense, Weisbach (1988), focuses on the monitoring role of the management carried out by outside directors. On the role of the board advice, Coles et al. (2008), Dalton et al. (1999) and especially Klein (1998) emphasize that critical issues related to board advisory role grow with increasing business complexity (e.g., degree of business diversification, firm size and weight of external funding in the firm capital structure).

Other studies introduce diversity as the presence of executive and non-executive or independent directors. In a number of cases the latter two profiles are used as synonyms, especially to set against the CEO role (Adams et al. 2005; Donaldson and Davis 1991; Pathan 2009; Smith and Stulz 1985).

These studies mainly derive from principal-agent theory: directors protect the interests of shareholders from possible selfish behavior of management, mainly the CEO. This stream of literature suggests that independent directors balance CEO power. As reported in Pathan and Faff (2013), empirical findings on the relationship between independent directors and firm performance are different and inconclusive (Bhagat and Black 2002; Yermack 1996). Moreover, a higher percentage of independent directors could help reduce the cost of debt (Anderson et al. 2004), improving the firm's merit of credit (Ashbaugh-Skaife et al. 2006) or reducing its systematic risk. In the banking sector, however, Cornett et al. (2009) and Mishra and Nielsen (2000) point out that independent directors contribute to better earnings management. For instance, a strengthening of the monitoring carried out by them is associated with a lower use of accounting and fiscal policies aimed at improving the financial results, as well as the definition of sustainable incentives for managers.

On the other hand, Fama and Jensen (1983) show that the benefits resulting from the presence of inside directors, with more widespread internal knowledge, grow with increasing information asymmetries to which the bank is exposed, for example with reference to the uncertainty in the operating environment. Adams and Ferreira (2007) report that, in such cases, banks should not rely solely on monitoring by outside directors.

Pathan (2009) analyzes a sample of more than 200 US bank holding companies in the period 1997-2004 and notes that the board structure is determinant in bank risk-taking. In addition, he finds a negative relationship between the presence of independent directors and the level of risk, pointing out that these directors can be especially crucial when there is the need to balance the interests between shareholders and other stakeholders (e.g. depositors and regulator).

The majority of the studies focus on diversity, defined as the presence of certain types of administrators, correlates diversity to a set of economic performance or market performance indicators. Results are, however, not conclusive. Evidence on banks is relatively scant. Some analysis (Beltratti and Stulz 2012; Pathan 2009) focus on the relationship between board composition and risk. Pathan and Faff (2013) show both a negative relationship between board independence and performance and a positive effect of gender diversity on bank performance. The relationship has weakened during the last financial crisis. However, the empirical findings about the direct effects of the presence of female directors on performance are differentiated and not definitive (Adams and Ferreira 2009; Carter et al. 2003; Farrell and Hersch 2005) and even less "consolidated" in the banking sector.

Bohren and Strøm (2010) highlight the lack of relationship between board diversity (in terms of presence of particular types of administrators) and economic performance. They conclude that no "convincing economic reason" appears to justify the imposition by law of a minimum level of representativeness of certain "profiles" of directors. In our opinion, in the light of regulatory approach, this statement is true, as diversity can be treated as an objective per se, a basic condition to ensure good governance, and must be defined in a more complex way, rather than the percentage of presence in boards of some kind of subjective characteristic.

Some interesting suggestions come from organizational studies, focused on the board as a "group of people" within which diversity can become a resource for the effectiveness of managerial decisions or, on the contrary, an obstacle and a source of conflict. Heterogeneity is a richness in the group's dynamics, to enhance creativity and the capacity for innovation and, more generally, to increase the operating efficiency of the board (Shergill 2001; Van der Walt et al. 2006). In particular, Richard (2000) shows how diversity in decision-making groups allows to achieve non-obvious solutions in the decision process on complex issues. Organizational studies are interesting both for the interpretation of the meaning of diversity and for the research of the determinants for heterogeneity in groups. In this way, the group performance, i.e. its ability to play strategic and problem-solving functions, is more important than firm's economic performance (Avigdor et al. 2007).

Once again, also in this stream of literature, studies on banks are quite rare and mainly dedicated to the study of managerial groups, rather than boards functioning (among these, Siciliano 1996).

Bantel and Jackson (1989), analyzing a sample of bank boards of directors, show that diversity in experience have a positive effect on the groups' ability to find "unconventional" solutions to complex and unusual problems.

Ferreira (2010) remarks that economic performance cannot be the primary goal in choosing the composition of the board, as other objectives are more significant, such as the efficiency of the decision-making process within the board and social performance, i.e. attention to all stakeholders.

Van der Walt and Ingley (2003), citing Smith (2001), highlight some doubts about the actual importance of diversity as a key to analyze board functioning. As a consequence, they observe that skills and the qualitative profile of directors and their behavior are much more important in influencing the effectiveness of the board functioning. Avigdor et al. (2007) also stress the impact of the interaction between the level of integration and board diversity on board performance. Outcomes are different according to the competitive and market environment in which firms operate. More precisely, heterogeneity adds value to the board functioning especially in complex and changing environments. On the other hand, in simpler and more stable contexts the negative effects of diversity are prevailing (separation and blocks in the decision-making process). Payne, Benson and Finegold (2009) reach similar conclusions, while also observe how boards are a sort of "black box": it is difficult to measure board functioning from the outside and, therefore, it is difficult to search for indicators to appreciate efficiency and effectiveness of board functioning.

Van der Walt and Ingley (2003) also observed that heterogeneity of a board is not a value in itself. The board's "value added" is a sort of "social capital" available for the firm. Board efficiency is strictly related to the qualification of its members. As a consequence, the best criteria aimed to board composition are based on credit and worthiness.

The analysis of board members' skills and experience characteristics is much more recent in literature and very few works are focused on the measurement of the competence of single members and of boards as a whole. This issue is quite well explored in managerial and organizational literature, while there are really a few studies on banking industry. Some studies have verified the impact of the presence of certain skills, especially financial ones, on risk-taking and overall bank performance. Minton et al. (2014) showed that banks where board members have a higher level of financial expertise have been riskier during the last

financial crisis. The Authors explain this as a result of a conscious exploitation of the "residual claim" mechanism, rather than as a larger ability to understand the effective level of risk within some complex financial contracts.

Few studies, finally, verify the overall level of board quality by basing it on an evaluation of the directors' curriculum. Hau and Thum (2009), in particular, study the impact of the low qualification of German banks directors on weak economic performance during the recent financial crisis. Similarly, Cuñat and Garicano (2009) show that the limited qualification of the chairmen of the board of directors that were appointed by politics and with political experience is associated with worse quality of the loan portfolio of the Spanish *Cajas* in 2007-2009. These studies put in clear evidence a link between poor qualified boards and poor risk management and performance in banks.

3. INSTITUTIONAL FRAMEWORK: REGULATION ON BANKING CORPORATE GOVERNANCE AND THE ITALIAN CASE

Moving from studies aimed at investigating the causes of recent banking crises (FSF 2008; Group of Thirty 2009), banking Authorities identified the quality of banking governance as a key factor in effective sound and prudent management. A "rule based" approach is going to overcome a "principle-based legislation", that seemed suitable to inconsistent or even opportunistic behavior of banks.

Consequently, at international and national level, regulation pursues essentially two objectives, namely fit and proper conditions for directors and board diversity. In this regard, regulation has provided a set of quantitative and qualitative requirements to identify the most appropriate characteristics to the role and responsibilities assigned to the board and to its effective functioning. In particular, regulation aims to increase the board accountability for the purpose of a strategic planning closely linked to risk management, ensuring balance of powers between the board and the management (the CEO in particular).

Also the Italian legislation on banking boards' structure, along with the European one, has undergone important changes, in particular regarding the composition and functioning of the board[1].

With regard to quantitative requirements, the provisions of the Bank of Italy (2015) have set a maximum number of board members equal to 15 (or 19 in case of one-tier model and 22 in

[1] This paragraph is mainly dedicated to the regulatory framework. For a more complete overview of the governance in the Italian banking system, see Caselli (2010), Carretta and Schwizer (2015).

case of two tier model). The Authority concludes that a too large board may reduce its effectiveness, as well as the incentive – per each director – to take any action to carry out its tasks. On the other side, it may hinder the functionality and decision making of the board.

With regard to quality requirements, regulation prescribes that board members must be aware of their role and responsibilities, have adequate skills, expertise and sufficient time to operate in the overall bank's interests. Moreover, regulation emphasizes that not only executives but also non-executive members must have an adequate knowledge of banking business, of the dynamics of the economic and financial system, of banking and financial regulation and, above all, of the methodologies of risk management and risk control.

In addition to the criteria and requirements related to the individual members, the supervisory rules provide that the board as a whole should reflect an appropriate degree of diversification in terms of skills, experience, age, gender and internationalization. Regulation introduces a definition of board heterogeneity that is more complex rather those used in most literature, i.e. diversity is not simply defined as the percentage of presence of some specific types of directors (female, independent, international, etc.).

Current regulation will be fully operational in Italy from July 2017 and it is expected to be subject to further adjustments, according to "fit and proper criteria" released by EU regulation and international guidelines[2] (Basel Committee 2015; OECD 2015; EBA 2016, ESMA-EBA 2016).

[2] The Basel Committee, in its document released in July 2015, detailed more closely qualifications useful to identify and verify requirements for each board members and the boardroom as a whole. These items have a particular relevance:
- With reference to the individual profile: "knowledge, skills, experience and independence of mind, integrity and good repute; have sufficient time";
- With regard to each director: "Should board members have a range of knowledge and experience in the relevant areas. Relevant areas of competence may include, but are not limited to capital markets, financial analysis, financial stability issues, financial reporting, information technology, strategic planning, risk management, compensation, regulation, corporate governance and management skills. Individual board members' attitude should facilitated communication, collaboration and critical debate in the decision-making process";
- With regard to the boardroom as a whole: "Should have board members varied backgrounds to promote diversity of views";
- With regard to the mix of skills, namely in terms of board diversification of the board: "the board collectively should have a reasonable understanding of local, regional and, if appropriate, global economic and market forces and of the legal and regulatory environment. International experience, where relevant, should also be considered".

4. METHODOLOGY AND RESULTS

Taking a start from the regulatory approach, we work on a proprietary hand collected database (see paragraph 4.1) to test first in a descriptive analysis quality and heterogeneity levels of Italian bank boards, using more complex measures of board heterogeneity and measuring quality and diversity features together (see paragraph 4.2); secondly, we propose a regression analysis of the link between these two boards' characteristic, trying to verify if more quality in boards is associated with more diversity (see paragraph 4.3).

4.1. Sample and data collection

The analysis is based on a proprietary hand collected database on the composition of 58 boards of the 54 major Italian banks by total assets.

According to Bankscope database, the sample is highly representative of the Italian banking system, with a total assets as at December 2014 covering about 86% of the whole system. Moreover, the sample shows a quite good overall representation by bank size. According to dimensional criteria stated by Bank of Italy for regulatory purposes, in our sample there are 5 major banks (i.e. total assets exceeding € 100 billion), 9 large (total assets between € 30 and 100 billion), 31 medium (total assets between € 3.5 and 30 billion) and 9 small banks (total assets between € 1 and 3.5 billion). Among the banks in the sample, 50 have a Italian traditional governance model (with the presence of a board of directors and a separate audit committee), while 4 banks adopt a two-tier model (management board and supervisory board).

After having collected names of the directors of the 58 boards, we end up with 700 directors.

For each director we have collected demographic information and details on education and expertise from the curriculum available on the bank website, updated at end 2015. The information has been verified and, when necessary, integrated with that derived from the reports on corporate governance and other documents publicly available on the web.

4.2. Measures of quality and diversity of directors

As existing organizational literature has discussed, an effective board is connected to a number of characteristic and their interconnection.

More precisely, some studies have shown that the effectiveness of board functioning is strictly linked to the overall level of competence of its members, and not necessarily only determined by the "demographic" profiles (gender, age, race, nationality) (Minton et al. 2014; Payne et al. 2009). Sonnenfeld 2002 has pointed out that other profiles are much more

relevant, i.e., directors' skills and expertise, but also their human, moral and behavioral characteristics. Basically, we agree with this statement that underlines the need of a complex mix of conditions defining a board composition, also according to regulation. Although, we need to be aware that some of these characteristics and conditions are often difficult to be identified within a director's curriculum. As a consequence, it should be hard to use them in an empirical test. Aware of this limitation, in this paper we focus on the level of expertise and experience of board members, as human characteristics are hard to derive from a curriculum.

In order to evaluate the level of competence, we focus, following Payne et al 2009, both on "theoretical" competence (education) and on "practical" skills, related to the level, the heterogeneity and the type of experience.

With regard to "theoretical" competence, for each director we record the level of the degree (BA, Master and Ph.D.) as well as the area in which the degree is taken (economics/business that also includes degrees in finance or accounting; engineering/quantitative; law; political science; other). A different score (see Appendix 1, Table A1) is assigned to each degree to summarize the level of education, as a proxy for quality and theoretical competence of each director.

With reference to the "practical" competence (i.e., the experience) two profiles are considered separately. First of all, the board experience is measured as "high", "medium" or "low", depending on the number of board positions currently or previously held (see Appendix 1, Table A1). Secondly, the managerial experience is traced and scores are assigned if the director was or is appointed as managing director, CEO, CFO, and so on. Also in this case, depending on the number of current and past duties, we identify a "high", "medium" or "low" degree of experience.

Moreover, as detailed in Table A1, we also introduce some "*premia*" (with an additional score) if board and/or managerial experience have been acquired in banks and financial intermediaries and companies ("financial" premium), at an international level or within a multinational enterprises ("international" premium), and achieved over the last five years ("recent" premium). These premia reflect the idea that the more qualified and specialized a board member is, the more he/she contribute to board functioning.

The focus on financial skills both in "theoretical" competence and "practical" one is also taken into consideration in the recent literature that analyzes the financial crisis that broke out

between 2007 and 2008 (among others Fernandes and Fich 2009, Minton et al. 2014)[3] and recent guidelines and regulation state that this profile is qualifying and almost "mandatory".

In this study individual skills determine the level of expertise of each board of directors. For each board of directors we build an overall score and we measure separately the level of "theoretical" competence (education), the level of experience (both in board, and managerial) and the level of specific financial expertise.

The underlying assumption is that the level of theoretical competence and the qualification of individual experience may positively influence the board's contribution and, therefore, result in a more effective board functioning. The higher the skills in a board, the greater is the expected influence over management (especially CEO), in terms of advisory role, control and planning.

In order to appreciate the overall efficiency of board functioning, we also record time dedication, i.e. the "theoretical" amount of time that a director may allocate to his/her duties as board member. Regulation states that time dedication has to be "adequate" and some banks have already established specific internal policies. Also in this case, three levels of score are identified ("high", "medium", "low"), according to the number of positions in other boards currently held by each director.

The impact of time dedication on board functioning is well explored in literature. On the one hand, the busier board members are, the lower is their time dedication; as a consequence, inefficiencies and board malfunctioning can arise (Lipton and Lorsch 1992; Shalley 1991). On the other hand, if directors are busy, it probably means that they have greater experience and/or expertise and contribute positively to board effectiveness (Harris and Shimizu 2004). Our opinion is that time dedication isn't necessarily a proxy of the level of skill and of potential contribution to the quality of board performance. A possible explanation relates to the fact that board members who have higher time dedication may have accumulated some important and long-lasting experience and/or a high expertise. Moreover, members with a low commitment could not allocate the available time carrying out their duties or to be more effective in the banking board's decision-making process.

We do not expect to find out a clear relation between time dedication and qualitative level of board members.

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[3] The mentioned studies have mainly investigated the existence of a relationship between the spread of financial skills among board directors and banks' risk profiles and performance. Empirical findings show that a widespread financial experience has a positive effect on the overall soundness of banks (Fernandes and Fich 2009), and it also influences the willingness to take risks or, rather, the ability to appreciate risk exposure (Minton et al. 2014).

As already noted (see paragraph 2), another line of the literature focus on diversity, showing that diversified boards are more effective in their activity as the interaction among different subjects enables to take better complex decisions. Although the benefits of diversity are well recognized and encouraged also by regulators, the definition of diversity is less well established. As already underlined, most of the literature defines and addresses diversity as the presence and weight in a board of given features analyzed one at a time, such as gender, nationality, race, independence. This approach does not seem sufficiently suitable to address diversity in its broad definition, especially considering the regulatory approach.

Taking the perspective introduced by Harrison and Klein (2007), this study analyzes different definitions of diversity.

Diversity can be interpreted as "disparity" when a member of a group has skills or competences that the others do not have and this makes him/her dominant in the group. This measure is particularly suitable when analyzing the role of the CEO or of the chairman of a board.

Diversity can also be interpreted as "separation" when board members differ with reference to given features, such as independence or executive members.

Finally, there is a notion of diversity as "variety", when heterogeneous individuals, according to multiple perspectives, are mixed together. In our opinion this is the most appropriate interpretation to measure diversity in boards of directors, also from a regulatory perspective. In addition, we guess that diversity as "variety" is a more comprehensive definition, including the first two, because members with different features and different skills and competences may coexist together within a heterogeneous board.

Solanas et al. (2012) suggest that different interpretations of diversity and the connected measures have different power in explaining diversity in a group. While some measures might be more appropriate to investigate gender or demographic aspects one at a time, as already said, it might be more difficult to simultaneously consider all the aspects in order to give a synthetic measure of diversity. It might be that two boards are diverse because of the different percentage of women, foreign or independent members, but this does not say anything on the interaction between independent and executive, foreign and domestic, women or men.

Moreover, diversity in a board cannot be computed as the sum of the different diversity measures relative to each aspect (Biemann and Kearney 2010; Solanas et al. 2012).

In line with this stream of literature, in this study different measures of diversity are employed to evaluate the presence of specific heterogeneity features among members

(demographic, education background, board and managerial experience, financial skills) to provide a comprehensive picture of diversity in boards and to test the consistency of these measures among similar banks. More in detail, three approaches are adopted, which are not used together neither in the literature on corporate governance, nor in group analysis of organizations.

The first measure employed is the Blau Index (Blau 1977; Campbell and Mínguez-Vera 2008; Solanas et al. 2012), that allows to evaluate the presence of a species or category in a group. It is a widely used indicator – not only in the economic literature – to measure diversity as variety. Moreover, it is widely used in literature on board diversity.

The Blau Index is a concentration index measured as $B = 1 - \sum_{i=1}^{k} {p_i}^2$, where p is the proportion of members of a group in a given category, and k the total number of categories. It varies between 0 and (k–1)/k; when B is equal to 0, this implies maximum concentration (or minimum diversity) and when B is equal to its max value, it means there is maximum variety (or diversity). To compare the index across variables, we employ a standardized version that varies from 1 to 0, obtained dividing B by its maximum. For each of the features analyzed with reference to education, time dedication and experience, categories are individuated and each board member is assigned to a single category in each feature (see Table 1).

TABLE 1. Blau index description

Diversity feature	Category
Education (Blau-e)	Postgraduate degree Degree in economics/business Degree in law Degree in political science Degree in engineering/quants Degree in other areas No degree
Board experience (Blau-b)	High (more than 5 positions) Mean (between 3 and 5 positions) Low (2 positions or less)
Managerial experience (Blau-m)	High (more than 5 positions) Mean (between 3 and 5 positions) Low (2 positions or less)
Financial experience (Blau-f)	No financial experience Financial experience in boards Managerial financial experience Both
Time dedication (Blau-td)	Low (more than 5 positions) Mean (between 3 and 5 positions) High (2 positions or less)

The second measure of diversity employed in the study is the Jaccard index (Jaccard 1901), that is a distance measure able to synthesize diversity for various characteristics. The index was born in natural sciences to study the diversity of eco-systems (see Chao et al. 2005), while it is less used in social sciences (among others, see Nobi et al. 2014 and Tsai and Chiu 2004).

Differently than the Blau index, the Jaccard index expresses the idea of diversity as stated by Harrison and Klein (2007) that appears consistent with regulatory provisions, as it underlines variety in a group.

To build the Jaccard index, the database has been translated into a binary database where each characteristic or attribute (e.g. age range, gender, nationality[4]) is present (1) or not (0) for each board member (see Table 2). The index is then calculated for each couple of board members within a board as: $J(i,j) = \frac{a}{a+b+c}$, where:

a = total number of attributes where both board members *i* and *j* have 1

b = total number of attributes where board member *i* has 1 and board member *j* has 0

c = total number of attributes where board member *i* has 0 and board member *j* has 1

The Jaccard index expresses hence the ratio between the number of occurrence of attributes 1-1 for each couple for a given qualitative element and the number of observations, without taking into account the occurrences with 0-0 for each couple. It varies from 1 (maximum similarity) to 0 (maximum diversity).

When applying the index to each board, a [*n*,*n*] symmetric matrix is obtained, where *n* is the number of board members. On the main diagonal there are only 1 as each board member is equal to him/herself. To synthesize the matrix, we take the average of the elements in the lower triangle (*J(i,j)*) but the 1 in the main diagonal. The standard deviation is also computed to evaluate the variability of the index.

[4] As example, a foreign female director aged 55 would have a 1 in the variables age range "50-60", female and international.

TABLE 2. Jaccard Index description

Variables	Characteristic
Gender	Female Male
International	Yes No
Age range	Under 40 40-50 50-60 Over 60
Education	Postgraduate degree Degree in economics/business Degree in law Degree in political science Degree in engineering/quants Degree in other areas No degree
Financial competence in education	Yes No
Board experience	High (more than 5 positions) Mean (between 3 and 5 positions) Low (2 positions or less)
Managerial experience	High (more than 5 positions) Mean (between 3 and 5 positions) Low (2 positions or less)

The third measure of diversity employed in this study is the total heterogeneity score (THS) built upon Anderson et al. (2011), who apply the score to a sample of non-financial companies, dividing each quality profile of the board members into quartiles and giving a score to each board according to the quartile it belongs to (1 point if in the I quartile, minimum heterogeneity, to 4 points if in the IV quartile, maximum heterogeneity). The sum of the scores gives the THS.

Nine different heterogeneity profiles[5] are considered, yielding a THS ranging from 9 to 36.

Table 3 provides descriptive statistics on the full sample, referred to demographic profiles, education, experience, and time dedication.

[5] The heterogeneity profile considered are: 1) Age (coefficient of variation); 2) financial skills as "theoretical" competences (% of administrators with degree or post-graduate degree in economics/business on total board directors); 3) Blau-e (diversity referred to education's profile of board members); 4) gender (% of women out of total board directors); 5) board experience (coefficient of variation); 6) managerial experience (coefficient of variation); 7) internationalization_1 (% of total foreign administrators out of total board directors); 8) internationalization_2 (% of directors with international experience out of total board directors); 9) financial skills as "practical" competences (% of administrators holding experience on international markets or in foreign countries out of total board directors).

The "theoretical" maximum diversity score is 36, that no board reaches. The scores of the 58 boards analyzed are comprised in a range from a minimum of 16 to a maximum of 28, with the mean value (median) amounting to 21.7 (21).

Banks boards in the sample seem quite different, with reference to board composition and the quantitative and qualitative profiles. With regard to board size, actually, some banks have a number of directors exceeding the regulatory limit. The average value (12.07) is however in line with regulatory provisions that will enter into force by 2017 (15 members; see paragraph 3).

Foreign and female directors are very few in number. Moreover, for a number of banks, these are completely absent. About 71% of board members has a degree, while the percentage of directors with financial competence or experience in the financial sector is around 39%. The percentage of directors with international experience is lower (about 28%).

The average score for quality is 11.20 (on a scale from 1 to 30 points), with a minimum value of 4.15 and a maximum level equal to 18.98. Average score referred to managerial experience has the lowest result (1.9, on a scale from 1 to 10 points) and a significant variability (minimum value equal to 0, maximum value equal to 4.63). The largest contribution to total score is referred to board experience (4.14 points, on a scale 1-10).

With reference to time dedication, results show a significant time availability (average score equal to 8.21, on a scale 1-10), thanks to a number of directors with no other duty in other boards.

Despite the high heterogeneity, these results seem to suggest the need for a further qualification of Italian banks board; we point out that regulation constraints are going to be more restrictive, and also boards that at the moment are complaint may need further improvement.

TABLE 3. Descriptive statistics – Full sample

Sample of banks	Measure	Number of obs	Mean	Median	Std. Dev.	Min	Max
Banks							
- Traditional governance system	*number*	54					
-Two tier governance system	*number*	4					
Total assets	*€ mn., 2014*		52,015	12,385	141,389	2,081	844,217
Board members	*number*	700					
- Banks with traditional gov. system	*number*	602					
- Banks with two tier governance system	*number*	98					
Board							
- Board size	*number*	58	12.07	11.50	3.93	5	24
- Board size, banks with traditional governance system	*number*	50	12.04	12.00	3.41	6	24
- Board size, banks with two tier governance system	*number*	8	12.25	8.50	6.24	5	23
Demographic profiles							
Age	*years*		61.1	61.0	10.1	27	86
Foreign directors	*%*		6.0%	0.0%	12.4%	0.0%	50.0%
Female directors	*%*		15.1%	16.0%	10.8%	0.0%	50.0%
Directors' education and experience							
Graduate directors	*%*		71.4%	78.5%	23.7%	0.0%	100%
Directors with financial experience	*%*		39.1%	38.5%	22.8%	0.0%	88.9%
Directors with international experience	*%*		28.8%	22.6%	25.8%	0.0%	90.0%
Boards' quality and skills							
Education	*score, scale 1 to 10*		2.99	3.06	1.13	0.00	5.71
Board Experience	*score, scale 1 to 10*		4.14	4.19	1.00	1.62	5.93
Managerial Experience	*score, scale 1 to 10*		1.90	1.84	1.07	0.00	4.63
Overall quality and skills	***score, scale 1 to 30***		**11.20**	**11.51**	**3.46**	**4.15**	**18.98**
Time Dedication	*score, scale 1 to 10*		8.21	8.27	0.89	5.94	10.00

This need is further confirmed by the analysis aimed to explore the level of financial expertise, that is a key perquisite in forthcoming regulation (see Table 4). The percentage of board members with financial expertise is, on average, lower for mutual banks (24%), while it is near to 71% for limited company banks. Moreover, the percentage is positively related to bank size: significant differences arise among dimensional clusters. Listed banks show a higher percentage, compared to unlisted ones. Therefore, there seems to be a need for an

increase in the level of financial expertise in Italian banks' board, almost for compliance purposes.

TABLE 4. The breakdown of the presence of board members with financial expertise

Banks' categories	% of board members with financial expertise
Limited company banks	71%
Cooperative banks	62%
Mutual banks	24%
Listed	76%
Unlisted	52%
Small	15%
Medium	64%
Large	71%
Major	80%
I size quartile	38%
II size quartile	61%
III size quartile	71%
IV size quartile	76%

Given the high heterogeneity among boards, we performed an additional statistical analysis to evaluate if banks characteristics have a relevance in determining boards quality and diversity. The analysis is performed through a PCA and results confirm that all identified profiles contribute, almost equally, to the overall score and to the understanding of differences among boards (for details see Appendix 2, Table A2). So, we may conclude that all these profiles are important and must be consistent together in order to appreciate quality and skills of board members, as required by regulation.

Statistics for the diversity measures employed in the study are reported in Table 5.

First of all, we observe a clear link between quality scores and diversity. For all categories, the higher is quality, the higher are different indexes of diversity. It can be also mentioned that the different measures of diversity show the same levels in different breakdowns of our sample. They are complementary in analyzing diversity levels.

Going to analytical results, for limited company banks and cooperative banks the Blau indexes are very high for each feature, especially with reference to education and managerial experience. This highlights a variety of profiles in this fields. Listed and unlisted banks do not show any particular difference, but for managerial experience and financial skills, where unlisted banks have a lower index, i.e., lower variety or diversity.

When distinguishing between size category and size quartiles, results do not show strong differences with reference to board experience. Smaller banks have a lower heterogeneity for

education and managerial experience. Also largest banks have a small level of the Blau index for education, although they have the highest for managerial experience.

The diversity for financial skills and competences and time dedication has also been taken into account, as for the regulatory prescriptions. With reference to time dedication, profiles of board members are quite diversified (average equal to 0.77) with small differences among groups of banks.

TABLE 5. Quality and diversity: averages for groups of banks

Groups of banks	Quality Score	Diversity						
		blau-e	blau-b	blau-m	blau-f	blau-td	Jaccard	THS
Full sample	11.20	0.76	0.88	0.67	0.74	0.77	0.38	21.70
Limited company banks	12.46	0.81	0.88	0.73	0.82	0.79	0.38	22.22
Cooperative banks	11.80	0.82	0.89	0.72	0.84	0.89	0.38	21.75
Mutual banks	5.94	0.52	0.85	0.37	0.35	0.56	0.45	19.80
Listed	13.65	0.76	0.88	0.82	0.87	0.82	0.39	22.40
Unlisted	9.91	0.76	0.88	0.59	0.67	0.74	0.39	21.34
Small	6.16	0.54	0.84	0.36	0.34	0.62	0.45	19.13
Medium	10.96	0.81	0.89	0.64	0.78	0.78	0.38	21.97
Large	13.32	0.82	0.90	0.82	0.88	0.89	0.36	22.73
Major	14.72	0.69	0.83	0.91	0.87	0.75	0.40	21.86
I size quartile	8.48	0.68	0.87	0.50	0.55	0.69	0.41	20.13
II size quartile	10.12	0.83	0.90	0.60	0.75	0.78	0.37	23.21
III size quartile	12.09	0.81	0.88	0.70	0.82	0.81	0.38	22.21
IV size quartile	14.50	0.74	0.86	0.89	0.88	0.81	0.39	21.50

Note: quartiles are computed on total assets as at end-2014 (Source: Bankscope).

With regards to financial skills, diversity appears to be more "floating". Mutual banks, smaller banks and unlisted banks show lower levels of diversity according to this profile. These figures, together with the presence of members with financial skills (Table 3), highlight some criticalities, if analyzed jointly with levels of financial expertise.

The average value for the Jaccard index for the full sample is 0.389, suggesting a quite strong diversity in the boards. Nevertheless there are some differences among the groups of banks, with a lower degree of diversity in mutual banks and in major and small banks, as already found for the Blau index. For major banks this might be read together with the values of quality, and it might suggest that major banks choose the directors with the best profiles in each feature, hence limiting diversity but enhancing quality. In fact, as a consequence of the way indicators are built in this paper, the higher the presence of high skilled directors, the higher the quality of the board, but the lower the diversity. On the contrary, as for mutual banks limited heterogeneity is associated with a lower level of quality in boards. In this case, instead, a lower diversity because of the presence of low skilled directors seems to arise.

The third diversity index, the THS substantially confirms previous results, although differences among groups are more remarkable than those obtained with Blau and Jaccard indexes. The average value is quite high (21.7), but diversity appears lower for mutual and smaller banks. The relationship between size and diversity provides the same results as those mentioned earlier. Unlisted banks show lower diversity than listed ones. The evidence provided by Anderson et al. (2011) seems therefore confirmed: as companies operating in more complex environments (such as banking and finance and different sizes in banks) demand higher quality profiles with different skills, visions and problem solving capacity, finally contributing to boards' heterogeneity.

Overall, descriptive statistics show a consistency among the three measures of diversity employed. Summarizing, mutual banks and smaller banks show a lower diversity and lower quality compared to other groups.

A first analysis of the averages of quality and diversity measures shows some relationship between the two variables. When size increases (according to both regulatory and quartile categories), diversity and quality increase as well, but for major banks that present slightly lower diversity scores, together with the highest quality score. This confirms our earlier assumption with reference to better and more qualified profiles among directors of major banks, which might lower diversity, probably thanks to their attractiveness for better educated and more experienced directors, compared to other banks. In other words, evidence provided by table 5 suggests that although diversity seems linked to a higher quality score in general, a

more homogeneous board with skilled and qualified directors (hence with low diversity) might be the result of specific choices of the bank and of the possibility to attract better directors, although with similar background. This might not be negative per se. The case for small banks with homogeneous boards, instead, is different and might highlight difficulties in attracting skilled directors and, in this case, a low level of diversity can be detrimental to board performance.

Correlations between quality and heterogeneity measures and some demographic characteristics are reported in Table 6. The sign between quality and most of the diversity measures also suggest that when the one increases, the other increases as well (more diversity), and the correlation coefficients appear significant especially for Blau-m, THS and Jaccard measures. For the latter measure, the sign is negative according to the fact that a Jaccard index equal to 1 means less diversity.

As a remark, diversity also appears negatively, although weakly (–0.14), correlated with board size. This might suggest that diversity is not necessarily achieved by increasing the number of directors and confirms the appropriateness of regulatory provisions cited in the third paragraph that prescribe a maximum number of directors.

TABLE 6. Correlation matrix

		Diversity							
	Quality	**Demographic profiles**			**Blau**			**Jaccard**	**THS**
	score	cvage	gender	internat.	Blau-e	Blau-b	Blau-m		
quality score	**1.0000**								
cvage	0.1120	**1.0000**							
Gender	**0.3112**	**0.2724**	**1.0000**						
internat.	**0.4140**	0.0060	0.0352	**1.0000**					
Blau-e	**0.3069**	0.0502	0.1390	0.1112	**1.0000**				
Blau-b	-0.0526	0.2085	0.1364	0.0433	**0.2906**	**1.0000**			
Blau-m	**0.7532**	0.0947	**0.3124**	**0.4113**	0.2533	0.1339	**1.0000**		
Jaccard	**-0.2971**	**-0.3155**	**-0.3631**	**-0.4311**	**-0.6962**	**-0.4549**	**-0.3979**	**1.0000**	
THS	0.2029	**0.4230**	**0.4660**	0.2335	**0.5092**	**0.3275**	0.2566	**-0.6261**	**1.0000**

Note: significant coefficients at 5% are reported in bold.

4.3. The relationship between quality and diversity of banking boards

Directors quality and diversity determine different scores for each board in the sample. After having measured board overall quality and diversity, we try to find out if there is a relationship between them and, more in detail, if the latter is able to influence the overall quality of the board, after controlling for bank and board size. As shown in paragraph 2, this is among the first studies to search for a relation between these two board characteristics. At

the same time, this is a possible way to test the consistency with regulatory constraints. Moreover, we tested the hypothesis that boards heterogeneity and quality are positively related. When highest quality scores are reached, diversity can be upper limited. As we have already shown, as far as we know, this is the first time in which such an hypothesis is tested in literature.

The model we test is the following:

$$quality_j = \alpha + \beta_1 X_j + \beta_2 DIV_j + \beta_3 Bdsize_j + \beta_4 Bksize_j + \varepsilon_j \qquad \text{Eq. 1}$$

Where

- $Quality_j$ is the quality score of the board j
- X_j is a set of demographic characteristics of board j, such as the coefficient of variation of age, gender and international
- DIV_j is the set of diversity measures presented in the previous paragraph (i.e. Blau Indexes, Jaccard Index and THS)
- $Bdsize_j$ is the natural logarithm of the board size, in terms of number of directors
- $Bksize_j$ is the natural logarithm of the bank size, in terms of total assets as at end-2014
- α and βs are the coefficients and ε is the error term.

Regression are performed starting from Eq. 1 and results are reported in Table 7.

TABLE 7. Regression analysis: quality and diversity

	reg1	reg2	reg3	reg4
Dependent variable:				
quality score				
Independent variables:				
cv age	6.664	1.090		
gender	2.438	0.223		
international	**4.847**†	2.471		
blau-e	**6.472***	**3.607***		
blau-b	-1.948	-3.265		
blau-m	**6.654*****	**6.114*****		
Jaccard	13.290		**-11.487***	
THS				0.073
Control variables				
Bdsize	**- 0.203****	**-0.980***	**-0.228***	**-0.213***
Bksize	**0.980****	**1.153*****	**1.953*****	**1.977****
Constant	**-17.170***	**-9.973**†	**-14.182****	**-20.807****
N	58	58	58	58
Adjusted R^2	0.711	0.701	0.567	0.521
F	16.550	17.731	26.06	21.69

Note: (†) significant at 10%; (*)significant at 5%; (**) significant at 1%; (***) significant at 0.1%.

The quality score is set as the dependent variable and is explained by different diversity measures (both demographic and for the education and experience) and control variables.
For the sake of synthesis, only the most relevant specifications of the model are reported.
We specified different regression models: specifications of the model described in Eq. 1 show that different measures of diversity (on a single variable, i.e. gender, or "synthetic", i.e. Blau indexes) have different signs and impacts on quality score. However, all variables except *cvage*, are significant for at least one regression model.
The first regression shows that the percentage of directors with international experience contributes positively to quality score, supporting the need to have some directors with specific knowledge of international markets, despite the significance is relatively weak. Among the diversity measures, blau-e (education) and blau-m (managerial experience) show strong statistical significance and positive sign, suggesting that the higher is the degree of diversity in these two profiles, the higher is the quality. This suggests hence, that diversity contributes to quality and that uniform boards, instead are on average less qualified. Diversity could be hence awarding also for very qualified boards that are made of highly skilled directors.
Control variables (size and board size) are both significant. The first is positive, suggesting that larger banks might have more attractive power towards more qualified directors. The second (board size) is negative, and highlights again that increasing board size is not a suitable strategy to increase quality.
The Jaccard score is not significant. As, by construction, it is built on the basis of the other regressors, the variable Jaccard might be highly correlated with the demographic and experience measures, and hence we drop the variable for *reg2*. Results remain similar, but the *international* coefficient becomes not statistically significant.
Jaccard and THS have also been tested alone, as they already incorporate the various different profiles of diversity. The coefficient for the Jaccard index in *reg3* is negative and significant, suggesting that the higher is the diversity (i.e. the lower the Jaccard index), the higher is the quality score for the board. THS instead, in *reg4* appears not statistically significant. In both regressions, the control variables keep their sign and significance.

Post estimation analyses controlling for heteroscedasticity and omitted variables confirm the goodness of estimations[6].

In order to focus on the role of financial skills in conditioning the quality level of banks' board, we tested a new version of the previous model, explained by the following Eq. 2:

$$quality_j = \alpha + \beta_1 FE_j + \beta_2 DIV_j + \beta_3 Bdsize_j + \beta_4 Bksize_j + \varepsilon_j \qquad \text{Eq. 2}$$

Where

- $Quality_j$ is the quality score of the board j
- FE_j is the percentage of board members with financial expertise
- DIV_j is the set of synthetic diversity measures discussed in the previous paragraph (i.e. Jaccard Index and THS)
- $Bdsize_j$ is the natural logarithm of the board size, in terms of number of directors
- $Bksize_j$ is the natural logarithm of the bank size, in terms of total assets as at end-2014
- α and βs are the coefficients and ε is the error term.

We test two further regressions, which results are shown in Table 8.

TABLE 8. Regression analysis: quality, financial expertise and diversity

	reg1	reg2
Dependent variable:		
quality score		
Independent variables:		
Jaccard	**–8.556***	
THS		–0.020
Financial expertise	**7.735*****	**8.122*****
Control variables		
Bdsize	**–0.1503***	**–0.131**†
Bksize	**1.012*****	**1.019*****
Constant	–5.373	**–8.733***
N	58	58
Adjusted R^2	0.7812	0.7529
F	51.88	44.43

Note: (†) significant at 10%; (*)significant at 5%; (**) significant at 1%; (***) significant at 0.1%.

According to our expectations, a more diffused financial expertise and education within banking boards has a positive impact on boards' quality score. Moreover, Jaccard index remains significant and with a positive sign. Control variables remain both significant: in

[6] More in detail, we run Breusch-Pagan / Cook-Weisberg test for heteroscedasticity that always take a p-value well higher than 10% and Ramsey RESET test for omitted variables that always takes a p-value higher than 26% but for the last estimation when it takes 6.29% (in any case higher than the significance level of 5%).

particular, board size has a negative sign, suggesting that the board dimension is negatively related with quality score. Our results seem to confirm the more recent regulatory approach, that stresses the relevance of financial culture of banks' board members. Furtherly, we find consistency with data reported in Table 4, where it was shown that financial skills are more diffused in bigger banks, which also show higher quality scores.

5. CONCLUSIONS AND FORWARD PROPOSALS

This paper fits in the wide literature on the functioning of board of directors in banks and provides an original contribution by analyzing the relationship between quality and different measures of diversity. In our view, according the regulatory approach, quality and diversity in boards are perquisites of good governance and can be treated as an objective per se. A qualified and diversified board can run a bank with a prudential view and pursue objectives that cannot necessarily be short term profitability.

Our focus is on a series of measures of diversity which might fit the regulatory provisions on the topic.

The analysis is performed on a wide representative sample of Italian banks of different nature (limited company, cooperative and mutual banks; listed and unlisted; banks of different size) that represent more than 86% of total assets of the Italian banking system as at end 2014.

Results show in general a positive relationship between each of three measures of diversity (Blau index, Jaccard index and THS) and quality (measured as education level and degree of experience of directors). Evidence and discussion of results highlight that comprehensive measures (such as Jaccard and THS) would be more suitable to explain diversity according to the general notion of the regulators, but more traditional measures (such as Blau index) are able to provide a more detailed insight on the elements that contribute to diversity. In our opinion, it is important to point out this result, since the same quality level for the board as a whole can be determined by a different composition of board members, with a higher or lower degree of diversity.

Diversity seems to increase as the size of the banks increases (both as regulatory categories and as total assets quantiles), except for very large banks. These might have a more attractive power towards the better educated and more experienced directors. On the one hand, this power contributes to quality, but, on the other, it may somehow uniform the type of directors included in the board, without implying a negative effect on the board performance and efficiency. On the other hand, boards of directors of mutual banks appear the least diversified and also the ones with the lowest quality score, meaning that they are constituted by low

skilled and similar directors. This calls for a review of the composition of these boards of directors in the light of the upcoming regulatory provisions. Hence evidence shows an adequate level of compliance to the forthcoming regulatory framework, although at the moment smallest banks show some weaknesses.

This study provides interesting hints for further research. One path to deepen the analysis might be to trace over time the evolution of the composition of boards of directors as regulation evolves and comes into force. Additionally, it would be interesting to extend our research in an international comparison, with a special focus to European Banking Union, where regulation on bank corporate governance is growing in homogeneity.

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Appendix 1: Scores of board members' competences

TABLE A1. Details of scores for "theoretical" and "practical" competences of board members

EDUCATION		**Score**
No degree		0
Degree		3
- economics/business		1
- law		1
Master		2
- economics/business		1
- law		1
Doctorate/Ph.D.		2
- economics/business		1
- law		1
Maximum score		**10**
BOARD EXPERIENCE		
1 or 2 positions	low	3
3 to 5 positions	medium	5
over 5 positions	high	7
financial experience premium		1
recent (last 5 years) experience premium		1
international experience premium		1
Maximum score		**10**
MANAGERIAL EXPERIENCE		
1 or 2 positions	low	3
3 to 5 positions	medium	5
over 5 positions	high	7
financial experience premium		1
recent (last 5 years) experience premium		1
international experience premium		1
Maximum score		**10**

Appendix 2: Results of Principal Component Analysis

Due to the high level of heterogeneity showed by descriptive analysis, we applied principal component analysis (PCA) in order to detect, on the one hand, which profiles most contribute to the overall score (quality) of each board, and, on the other, which the main characteristics that contribute significantly to differentiate boards among them.

Variables and individual scores used in PCA are referred to education ("theoretical competence"), board experience and managerial experience ("practical competence"). They represent the three components of our analysis. Results are summarized in fig. A1 and in tab. A3.

Results confirm that all identified profiles contribute, almost equally, to the overall score and to the understanding of differences among boards (tab. A2). So, we may conclude that all these profiles are important and must be consistent together in order to appreciate qualities and skills of board members, as required by regulation.

Comp1 and comp2 – as linear combination of the original variables – help to explain more than 89% of sample variability (tab. A3). Therefore, they are highly significant in the analysis of the phenomenon. In other words, boards differ among them mainly on the basis of two out of three components. The sign of each coefficient suggests, in comparative terms, the impact of each component in boards differentiation.

TABLE A2. The results of principal component analysis (PCA) on directors' level of education and skills

Principal components/correlation *Number of obs* *58*
Number of components *3*

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.0723	1.4521	0.6908	0.6908
Comp2	0.6202	0.3128	0.2067	**0.8975**
Comp3	0.3075	0.0000	0.1025	1.0000

Variable	Comp1	Comp2
Education	0.6187	-0.2329
Board experience	0.5172	0.8397
Managerial experience	0.5914	-0.4906

Fig. A1 summarizes differences among boards, clustered by legal form, bank size class and listing. Each pair represented in the graph is a board, located in the area according to comp1 and comp2.

Boards placed to the right of zero by comp1 (X-axis) have, on average, directors with a higher education score, as well as greater board and managerial experience. Vice versa, with reference to comp2 (Y-axis), the boards placed on the top (i.e., above 0) are characterized on average by directors with a higher level of board experience, but a lower education score and a lower score for managerial experience. The weights of these variables have a negative sign.

Moreover, the comparison between two boards with the same score of comp1 (X-axis) is mainly determined by directors' board experience, i.e., the variable with the highest coefficient – in absolute value – for comp2).

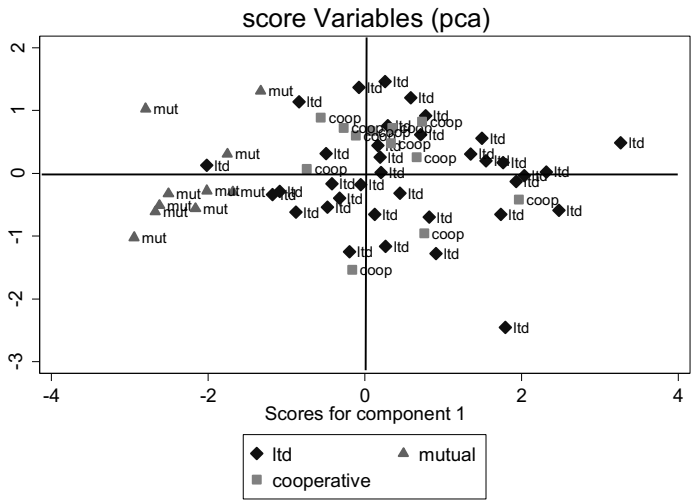
With regard to comp1, all mutual banks are placed at the left of zero. Within their boardrooms, only in a few cases directors have significant board experience in other boards (III quadrant, positive coefficient for comp2) and have a lower level of education and also of managerial experience (IV quadrant, negative coefficient for

comp2). Vice versa, the majority of limited company banks and a relevant share of cooperative banks have positive coefficients for comp1. Their boardrooms are not significantly different in terms of boards' qualification.

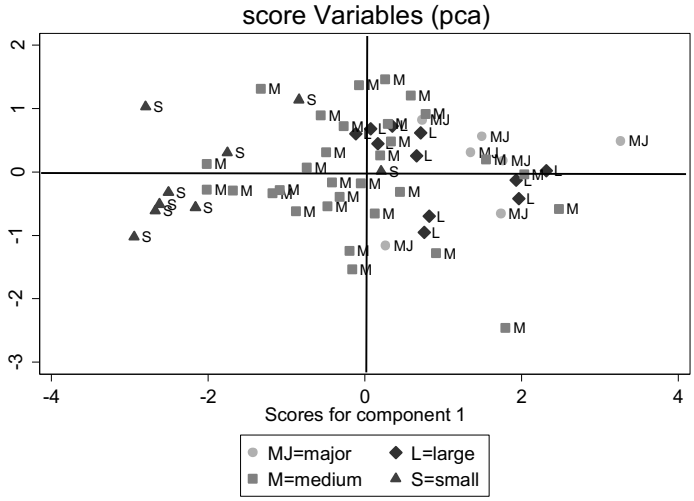
With reference to bank size, all small banks (except one) are on the left by comp1, while major banks are placed to the right (Figure A1, panel b). The distribution of the other banks is quite widespread. This seems to suggest that board qualification is higher for larger and more complex banks. A possible explanation can be related to the greater attractiveness of such banks to best and highest skilled directors. Moreover, the smallest banks have to invest into a further qualification of their board members, in order to be fully compliant to regulation.

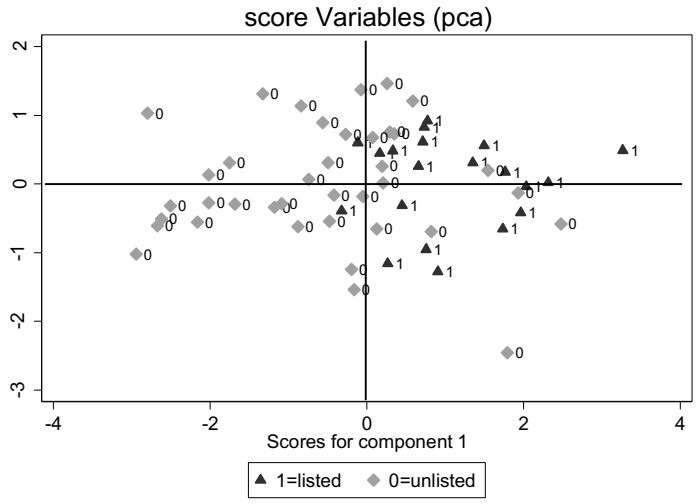
FIGURE A1. The representation of PCA by banks' clusters

Legal form (a)



By size (b)



Listed and unlisted (c)	

The boards of listed banks are almost all (but two exceptions) on the right side by comp1: board members have a higher level (and corresponding score) in education, as well as in board and managerial experience. We may probably conclude that listed banks have a greater attractiveness for more qualified profiles. Moreover, it is worth mentioning that Italian companies listed on Italian Stock Exchange apply a self-regulation Code and regulation specifically aimed at listed companies, which resulted in a board qualification process board that anticipated banking regulation. Finally, it has to be considered that there are also some non-listed banks whose board members are highly qualified and skilled.

The framework depicted with PCA does not show any strong aggregation of clusters of banks in a precise point or area. As a consequence, we may conclude that bank size and legal form do not uniquely define the board qualification. Nevertheless, the majority of boards of the largest banks and listed ones are, on average, more skilled and qualified: board members have a higher level of education and experience, both for attractiveness and regulatory constraints.

TABLE A3. Total assets and number of board members of banks by legal form

Legal form	Total Assets (€ million)			N. of Board members (average)
	Average	Min.	Max.	
Limited co. Banks	86,847	2,081	844,217	11.4
Coop. Banks	39,816	6,526	123,082	14.3
Mutual Banks	4,392	2,505	10,528	11.6
Total sample	**52,015**	**2,081**	**844,217**	**12.1**