

# The Demographic Characteristics of the Boards of Directors and Effects on Bank Robustness

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## Abstract

*The demographic characteristics of the directors have previously been considered in the literature with reference to different aspects of corporate life, such as firms' performance, market price volatility and, generally, their risk appetite. The mandatory introduction of a minimum level of leverage ratio within the banking system with Basel III opens up a new field of investigation that is addressed for the first time by our research. Using a database of 13 significant Italian banks, we found that the robustness of the banking system is positively related to the percentage of directors on the board holding degrees in economics, their age and the board size. We highlight the finding that the percentage of holders of degrees in law has no impact on banks' leverage ratios. The obtained results confirm and sustain that the board composition of banks is very important for achieving a more robust banking system.*

**Keywords:** bank robustness; corporate governance; board diversity; banks' leverage ratio.

**JEL:** G38, G28, M120, M140

## 1. Introduction

The macroeconomic changes and the credit crunches that have characterized recent years have contributed to the fact that the value creation process can more appropriately be interpreted in a broad perspective which includes on-financial variables, in order to better appreciate management performance. The pressures exerted on companies by the main stakeholders, *in primis* the regulators, have translated into a progressive adherence to corporate governance, moving towards a greater accountability of firms. The regulators' goal is to ensure conditions of 'going concern' through the development of reputational capital, the construction of a better legitimacy on the market, diversification when facing competitors and the definition of long-term strategies.

Corporate governance literature (Allegrini and Greco, 2013; Ananth *et al.* 2011; Boeasso and Kumar 2009; Capasso *et al.* 2014; Charreaux and Desbrières 2001; Courteau *et al.* 2017; Di Pietra *et al.*, 2008; Eccles and Guatri 2000; Habisch *et al.* 2011; Hillman *et al.* 2007; Ho and Wong 2001; Kaczmarek *et al.*, 2014; Kumar and Zattoni, 2017b; Matacena 2010; O'Sullivan *et al.* 2015; Nguyen *et al.*, 2017; Pizzo, 2012; Thomasine *al.*, 2014, among others) recognizes the role played by an effective governance system in introducing a virtuous circle in terms of business efficiency and integrity, while also having positive repercussions on other stakeholders, such as customers, creditors, consumers, suppliers, employees, communities and the environment. This paper takes as its starting point the increase in regulation regarding corporate governance as the answer to the decrease in ethical behaviour in financial markets. The proliferation of laws and code on corporate governance items<sup>1</sup> has been the concrete response to a crisis in business ethics which has led to numerous financial scandals over recent decades. The set of rules and mechanisms that determine the management and control framework of entities represents an instrument intended to disclose management strategies aimed at satisfying the different interests involved and realizing *value* in a broader sense (Ferrando *et al.*, 2015).

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<sup>1</sup>Delivered by the European Commission, the Global Reporting Initiative, Commissione Nazionale per la Società e la Borsa (CONSOB), Borsa Italiana, Banca d'Italia, Codice di Autodisciplina (Italian Preca Code) and so on.

In which both economic-financial (e.g. level of leverage ratio) and non-financial dimensions are conceived as a whole (Frias-Aceituno *et al.*, 2014). Among the priority directives is self-assessment of the BoD and evaluation of the internal control system, with an approach to governance that is increasingly oriented to risk management. In this perspective, as a response to the global financial crisis the Basel Committee on Banking Supervision (BCBS) decided to undertake a major reform of the regulatory framework of the banking system. In particular, the BCBS envisages the leverage ratio as playing a key role in avoiding adverse developments in the future. Under the Basel III banking regulations, a non-risk-based leverage ratio requirement is introduced alongside the risk-based capital framework, in order to “restrict the build-up of excessive leverage in the banking sector, to avoid destabilizing deleveraging processes that can damage the broader financial system and the economy and reinforce the risk-based requirements with a simple, non-risk based “backstop” measure”<sup>2</sup>. The Basel Committee is of the view that a simple leverage ratio framework and a credible leverage ratio are able to ensure the broad and adequate capture of both on- and off-balance sheet sources of banks’ leverage. The Basel III leverage ratio (LR), expressed as a percentage, is defined as the capital measure (the numerator) divided by the exposure measure (the denominator):

$$LR = \text{Capital measure} / \text{Exposure measure} \quad (1)$$

The capital measure used for the leverage ratio is the Tier 1<sup>3</sup> applying at that time under the risk-based framework. A bank’s total exposure measure is the sum of the following: (a) on-balance sheet exposures; (b) derivative exposures; (c) securities financing transaction (SFT) exposures; and (d) off-balance sheet (OBS) items<sup>4</sup>. Banks must not use physical or financial collateral, guarantees or other credit risk mitigation techniques to reduce the exposure measure.

An LR requirement may be beneficial for the banking sector. In fact, the potential increase in risk-taking is more than compensated for by the substantial increase in capital positions for highly leveraged banks, resulting in significantly lower estimated distress probabilities for banks bound by the LR. Thus, theoretically, obliging banks to hold greater capital via an LR requirement is beneficial for bank stability.

Implementation of the leverage ratio requirements has begun with bank-level reporting of the leverage ratio and its components to national supervisors from 1 January 2013, with public disclosure starting from 1 January 2015. The final calibration, and any further adjustments to the definition, is scheduled to be completed by 2017, with a view to migrating to a Pillar 1 (minimum capital requirement) treatment on 1 January 2018.

The adjustment process of the LR to (at least) 3% requires a prompt reaction by banks’ governing bodies. The board of directors is called upon to work with targeted goals to achieve this purpose, and the control body has to monitor and oversee the choices made and the operational consequences. A compliant adjustment is particularly important in the case of significant banks. According to the European Central Bank, to be considered significant a bank must fulfil at least one of these criteria: i) the total value of its assets exceeds €30 billion; ii) economic importance, for the specific country or the EU economy as a whole; iii) the total value of its assets exceeds €5 billion and the ratio of its cross-border assets/liabilities in more than one other participating Member State to its total assets/liabilities is above 20%; iv) it has requested or received funding from the European Stability Mechanism or the European Financial Stability Facility.

In the literature *board diversity* is defined in terms of heterogeneity of the ethnicity, nationality, age and gender of the members of the board of directors (hence forth BoD). Several studies have shown that there is a positive relationship between the heterogeneity of the BoD and companies’ financial performance (Erhardt *et al.*, 2003, Hillman *et al.*, 2007), social performance (Siciliano, 1996), and reputation (Miller, 2009).

The reasons that justify this positive relationship are various: for instance, heterogeneity leads to better understanding and market knowledge, better problem solving skills, better global relationships and so on. The intention of this paper is to answer the question: is there a relationship between the board composition and the level of bank risk taking? In recent years a vast body of literature discusses the board composition (see Adams *et al.*, 2010 for an exhaustive literature review on the topic).

<sup>2</sup> Basel Committee on Banking Supervision, “Basel III Leverage ratio framework and disclosure requirements”, January 2014.

<sup>3</sup> TIER 1 is the bank’s core capital, and includes equity capital and disclosed reserves.

For more details see Basel Committee Supervision, “Basel III: A global regulatory framework for more resilient banks and banking system”, June 2011

<sup>4</sup> For more details see Basel Committee on Banking Supervision, “Basel III Leverage ratio framework and disclosure requirements”, January 2014

These studies focus on board independence (e.g. Hermalin and Weisbach, 1988), the determinants of board size (e.g. Boone *et al.*, 2007), the relationship between ownership structure and board composition (e.g. Denis and Sarin, 1999), the effect of outside directors on performance (e.g. Dahya *et al.*, 2002; Dahya and McConnell, 2007; Hermalin and Weisbach, 1991), the influence of gender to firm performance, firm's organizational structure, and acquisition strategies (e.g. Farrell and Hersch, 2005; Adams and Ferreira, 2009; Faccio *et al.*, 2011; Ahern and Dittmar, 2012; Adams and Funk, 2012; Liv *et al.*, 2014; Levi *et al.*, 2014). Despite this large literature, little is known about the link between demographic characteristics of directors and the bank risk taking (Berger *et al.*, 2014) in particular when measured by the leverage ratio. Thus, this paper increases and expands the literature on this field of analysis with a specific contribution considering the significant Italian banks. The analysis we carried out considers the role played by the demographic characteristics of directors in LR decision-making, so as to identify the composition of a board of directors more fitted to achieving the robustness of the banking system. Bearing in mind the recent introduction of the LR and the short period of public observation by the European authorities, this paper is the first to deal with the leverage ratio for significant Italian banks. Moreover it represents an original point of view of a technical aspect, imposed by the law, with important consequences for the banking sector.

The results obtained may prove to be interesting from different perspectives of analysis. For regulators they inform better understanding of which types of board, in terms of demographic characteristics, are more compliant to regulatory changes and to ethical purpose in terms of risk-taking. At the same time this information can be instrumental in the forming of the boards themselves, including within the self-disciplinary code. They should also prove useful to the market, highlighting how much the corporate governance component can affect a company's dynamics in the process of adjusting to what is required by the standards. The paper is organized as follows. Section 2 summarizes the main literature on the topic and shows the hypothesis developed; Section 3 describes the data and the methodology used in the analysis; Section 4 highlights the main results obtained and Section 5 concludes the paper.

## **2. Literature review and hypothesis development**

Fama and Jensen (1983) and Williamson (1983) suggest that the board of directors is an important part of the governance structure of corporations; Jensen (1993) argues that board size could influence the behavior and the decision-making process of the board. The social psychology literature on group decision-making presents experimental evidence that larger groups have to make compromises to reach a consensus and, therefore, are likely to make more moderate decisions (Moscovici and Zavalloni, 1969). Sah and Stiglitz (1991) argue that a larger group corresponds to a better quality of decision-making.

The literature includes studies of the number of directors in relation to several firm outcomes such as business complexity and performance. Baker and Gompers (2003) and Coles *et al.* (2008) demonstrate that firms with complex businesses need larger boards because of the difficulties involved in monitoring and advising such corporations. Kocher and Sutter (2005) highlight the fact that firms with complex business models require a lot of linkages to the external environment, which only a large board can provide. In these firms, the benefits of a large board are greater than the cost of social loafing and free riding (Boone *et al.*, 2007).

Many authors consider the relationship between board size and firm performance, but the results obtained are mixed. According to Chiang (2005), Williams *et al.* (2005) and Haniffa and Hudaib (2006) there is a positive relationship between the number of directors and company performance. Lipton and Lorsch (1992) point out that limiting board size improves firm performance, and they suggest that the board size should be limited to a maximum of ten directors. A negative relationship between board size and company performance is suggested by Yermach (1996) and Eisenberg *et al.* (1998). Agyemang *et al.* (2014) do not find any significant relationship between the two dimensions presented.

Kogan and Wallach (1964) argue that an increase in the size of the decision-making group decreases its propensity to risk. In the context of corporate boards, Cheng (2008) suggests that larger boards reduce firm risk. In fact, according to the author, firms with larger boards appear to select less risky investments. In the case of financial institutions, Pathan (2009) shows that board size is associated with lower return volatility.

These conditions suggest our H1: Bank risk propensity decreases in larger board of directors.

To achieve the minimum leverage ratio required by Basel III, the board of directors is called upon to make some strategic decisions with reference to the entity of the capital and/or to the amount of total exposure. Hambrick and Mason (1984) highlight the fact that the strategies and effectiveness of an organization are substantially shaped by demographic characteristics such as the educational level, age, tenure, and gender of top executives. Generally, women are more risk-averse (e.g. Croson & Gneezy, 2009; Eckel & Grossman, 2008; Jianakoplos & Bernasek, 1998), whether they act individually or in making a team decision, while men are more overconfident than women (e.g. Barber & Odean, 2000; Croson & Gneezy, 2009; Eckel & Grossman, 2008; Lundberg *et al.*, 1994).

Many studies examine gender risk aversion taking into consideration nationality, and the results obtained converge. According to Palsson's study (1996), Swedish women tend to be more risk-averse than men; the same conclusion is confirmed by Donkerset *al.* (2001) and Hartog *et al.* (2002) for the Dutch. Israeli women are more risk-averse than men (Cohen & Einay, 2007) and the same behavior is observed in Germany (Dohmen *et al.*, 2011) and in Taiwan (Lin, 2009). In two countries, Switzerland and Denmark, respectively examined by Schubert *et al.* (1999) and Harrison *et al.* (2007), there is no difference between men's and women's risk attitudes.

These conditions suggest our H2: A higher representation of female in the board of directors reduces bank risk taking.

Botwinick (1977) and Burke and Light (1981) show that cognitive abilities including learning ability, memory and reasoning decrease as people age. Moreover, Carlson and Karlsson (1970) and Vroom and Pahl (1971) demonstrate that older executives tend to avoid risky decisions. However, in recent years, it has been shown that the relationship between age and risk-propensity is not clear. Campbell (1987) highlights the fact that younger managers seem to handle new and creative ideas better than older managers; according to Guthrie and Olian (1991), they tend to implement more risky and innovative growth strategies. According to Morin & Suarez (1983), Brown (1990), Bakshi & Chen (1994) and Palsson (1996) there is a positive correlation between age and risk-propensity. Riley & Chow (1992), Halek & Eisenhauer (2001) and Harrison *et al.* (2007) show that risk-aversion decreases with age up until 65 years of age and then increases significantly. Cohen and Einay (2007) find a U-shape in the relationship between age and risk-seeking.

These conditions suggest our H3: Bank risk taking decreases in board age.

In many studies (e.g. Datta & Rajagopalan, 1998; Hambrick & Mason, 1984; Wailderdsak & Suehiro, 2004; Wiersema & Bantel, 1992), educational level is considered a good proxy for human capital, knowledge, or intellectual competence. In the literature not only is the educational level taken into consideration, but also the subject studied is considered. Christy *et al.* (2010) show that the proportion of board members holding a financial degree is negatively associated with the market risk of equity in Australia. In a recent study, Litov *et al.* (2013) find that lawyer directors reduce corporate risk-taking and increase firm value. Audretsch and Lehmann (2006) argue that directors with academic backgrounds can enhance the competitive advantage of firms by facilitating access to and the absorption of external knowledge spillover. Many studies indicate that board diversity is an important factor influencing board efficacy and firm performance (Adams & Ferreira, 2009; Anderson *et al.*, 2011; Carter *et al.*, 2003; Gul *et al.*, 2011). Milliken and Martins (1996) note that diversity increases the aggregate level of resources at the group's disposal but it is also associated with high levels of conflict, interactional difficulties and lower levels of integration. Moreover, board members have few opportunities to diminish or smooth over the differences that separate them because they only interact periodically. Thus board diversity can lead to higher levels of cognitive conflict (Williams & O'Reilly, 1998), so boards whose members have diverse backgrounds are also likely to be less cohesive. Considering the complex and sensitive decisions that a board of directors is called upon to make, we believe that having a degree in economics or in law can impact positively on the decisions taken in the company's interests and consequently on its risk level. These conditions suggest our H4: A higher representation of degree in economics or in law in the board of directors decreases bank risk taking.

### **3. Data and Methodology**

#### **3.1 The sample**

This paper considers the Basel III leverage ratio framework, along with the public disclosure requirements applicable as from 1 January 2015. The BCBS is currently testing a minimum LR of 3% until 1 January 2017.

The database used in the analysis comprises the 13 significant Italian banks<sup>5</sup>. For each bank we consider the size and the composition of its board of directors at the end of 2014, 2015 and 2016, the years of interest for the Basel reform. In particular, for each director we gather information about gender, age, and educational level. From 2015 (the first year of LR publication) we collected the year-end leverage ratio calculated by each bank and the amount of total assets. Table 1 summarizes and describes the variables used in the model while Table 2 shows the descriptive statistics of the sample. Table 3 presents the matrix correlation between the variables considered in the analysis.

**Table 1 – The variables used in the analysis**

Variable: Dependent	Description	General expectation
LR	Is the bank leverage ratio calculated at the year-end	
<i>Independent variables</i>		
%men	Is the percentage of men on each board for each bank.	Positive/negative
age	Is the average age of board members for each bank.	Positive/negative
%eco_graduates	Is the percentage of degrees in economics for each board for each bank.	Positive
%law_graduates	Is the percentage of degrees in law for each board for each bank.	Positive
ndirectors	Is the number of directors per board for each bank.	Positive/negative
tot_asset	Is the logarithm of the total assets at the year-end.	Negative

As Table 1 shows, with reference to the level of education, we consider the percentage of degrees in economics and in law because they are suggested by Christy *et al.* (2010) and Litovet *et al.* (2013) to be more influential in the decision-making process in the field of risk.

**Table 2 – Descriptive statistics (N=39; n=13; year 2014-2015-2016)**

This table presents the main descriptive statistics of the variables considered in the survey: LR is the bank leverage ratio; %men is the percentage of men on each board for each bank; age is the average age of board members for each bank; %eco graduates is the percentage of degrees in economics for each board for each bank; %law\_graduates is the percentage of degrees in law for each board for each bank; ndirectors is the number of directors on each board; tot\_asset is the logarithm of the total assets at the year-end.

Variable	Mean	Std. Dv.	Min	Max
<i>Dependent Variable: LR</i>				
Overall	0.0616	0.0172	0.0317	0.109
Between		0.0164		
Within		0.0057		
<i>Independent Variables</i>				
%men	0.7609	0.0800	0.5625	0.8947
Between		0.0613		
Within		0.0609		
age	60.27	2.8387	55.50	67.50
Between		2.6550		
Within		1.1749		
%eco_graduates	0.5402	0.1697	0.1052	0.8889
Between		0.1524		
Within		0.0826		
%law_graduates	0.2092	0.1252	0	0.61
Between		0.1185		
Within		0.0486		
ndirectors	17.89	6.9992	5	32
Between		5.7693		
Within		4.1780		
tot_asset	18.2760	1.0880	17.0778	20.5898
Between		1.1166		
Within		0.0499		

**Table 3 – Matrix correlation**

<sup>5</sup> Banca Carige, Banca MPS, Banco Popolare, Banca Popolare dell'Emilia Romagna, Banca Popolare di Milano, Banca Popolare di Sondrio, Banca Popolare di Vicenza, Credito Emiliano, Banca IntesaSanPaolo, Mediobanca, Unicredit, UBI Banca, Veneto Banca.

This table presents the correlation between the variables considered in the survey: LR is the bank leverage ratio; %men is the percentage of men on each board for each bank; age is the average age of board members per each bank; %eco\_graduates is the percentage of degrees in economics for each board for each bank; %law\_graduates is the percentage of degrees in law for each board for each bank; ndirectors is the number of directors on each board; tot\_asset is the logarithm of the total assets at the year-end.

	%men	age	%eco_graduates	%law_graduates	ndirectors	tot_asset
%men	1					
age	-0.0066	1				
%eco_graduates	-0.1421	-0.5231	1			
%law_graduates	-0.1378	0.0513	-0.3340	1		
ndirectors	0.0213	0.1119	-0.2472	-0.2398	1	
tot_asset	-0.0629	-0.1300	0.2820	-0.0135	0.3944	1

### 3.2 Methodology

To test the board of directors' attitude to being compliant with the leverage ratio established by Basel III, a regression was used as follows:

$$LR = \beta_1\%men + \beta_2age + \beta_3\%eco\_graduates + \beta_4\%law\_graduates + \beta_5ndirectors + \beta_6tot\_asset + \sum_{t=2014}^{2016} t + \varepsilon \quad (2)$$

where LR is the leverage ratio calculated by each significant bank at the end of each examined year (2014, 2015, 2016); %men is the percentage of men on each board per year; age is the average age of the directors calculated per year; %eco\_graduates is the percentage of degrees in economics and %law\_graduates is the percentage of degrees in law held by each board per year; ndirectors is the number of directors on each board per year and the tot\_asset is the logarithm of the total assets for each bank per year.

### 4. Results

In a first round of analysis we consider all the variables presented above (Model 1). The regression results (2) are shown in Table 4. The results obtained are to some degree in line with those expected, while others are very interesting. The presence of men on the board has a positive impact on achieving bank robustness, thus our H2 is rejected; however this result is due to the fact that there are few female son the boards of directors of the examined banks (on average 25%, as indicated in Table 2). Thus, the majority of directors are men and so it is unsurprising that the impact on LR is due to men's decisions. The level of total assets is negative on the LR calculation and this is an expected result due to formula (1) as suggested by Basel III for calculating the LR. Table 4 highlights the fact that the older the board, the higher the tendency to increase the LR. This result confirms our H3 and it is consistent with findings reported in the literature, for example by Carlson and Karlson (1970) but also by Halek and Eisenhauer (2001) and Harrison et al. (2007).

This table presents the regression results of the two models. In Model n. 1 we consider all the variables examined in this paper (%men is the percentage of men on each board for each bank; age is the average age of board members for each bank; %eco\_graduates is the percentage of degrees in economics for each board for each bank; %law\_graduates is the percentage of degrees in law for each board for each bank; ndirectors is the number of directors on each board; tot\_asset is the logarithm of the total assets at the year-end) while in Model n. 2 we do not consider %law\_graduates.

**Table 4 – Regression results**

Variables	Model n. 1	Model. 2
Men	2.897*	3.155*
	(1.694)	(1.710)
Age	0.137**	0.140**
	(0.0687)	(0.070)
eco_graduates	3.665***	3.646***
	(1.148)	(1.171)
law_graduates	1.425	
	(1.606)	
ndirectors	0.0595***	0.0528***
	(0.0207)	(0.0199)
tot_asset	-0.664*	-0.669**
	(0.350)	(0.339)
t2	-0.314*	-0.319
	(0.190)	(0.196)
t3	-0.972***	-0.996***
	(0.217)	(0.223)
Constant	4.962	5.060
	(7.977)	(7.892)
No. of observation	39	39
Prob>Chi2	0.0000	0.0000
* p<0.10; ** p<0.05; *** p<0.01		

The more interesting results concern the board size and the level of education. With reference to the former, the results obtained confirm our H1 that a larger board reduces a bank's exposure to risk, i.e. Cheng's conclusion (2008) is confirmed. This result is also important from another perspective: banks run a complex business (and this complexity is increasing over time), and a larger board may lead the bank to more efficient and effective links with the economic context as indicated by the studies by Baker and Gompers (2003) and Coles *et al.* (2008).

With reference to the second item, educational level, our results suggest that the more degrees in economics are held by members of the board, the higher the LR. We recall that the higher the LR is (as calculated by Basel III), the greater the robustness of the bank, so our result confirms a negative relationship between financial degrees and the level of risk taking (Christy *et al.*, 2010). However, the percentage of degrees in law is not statistically significant and this result does not confirm the conclusions of Litovet *et al.* (2013). Faced with these findings, we repeated the regression analysis (2) without the percentage of degrees in law (Model 2) and the results obtained, shown in Table 4, confirm the results obtained through Model 1. This robustness check is very important for corroborating our analysis. Our H4 is partially confirmed.

## 5. Conclusions

Since the recent financial crisis, the banking system's robustness has become more and more important in considerations of how to avoid similar negative situations in the future. In this perspective, Basel III introduced a specific framework regarding banks' leverage ratios, considered one of the principal causes of the crisis. The board of directors of each bank is responsible for implementing the framework issued by Basel III through the adoption of some specific strategic decisions aimed at improving the bank's robustness. A board of directors may aim to achieve a higher leverage ratio with respect to that imposed by Basel III, thus expressing greater commitment to ensuring the bank's robustness. In our research we have analyzed the demographic characteristics of each member of the boards of directors of the significant Italian banks, finding that the boards' propensity towards their bank's robustness is not the same.

The results obtained on the one hand confirm some results previously described in the corporate governance literature, while on the other they contribute to and expand the literature on bank risk taking measured by the leverage ratio; in particular three results seem particularly significant. The first is that the older the board members, the higher the leverage ratio.

The second is that our results confirm that a larger board reduces risk. This result is also important from another perspective: the banking business is complex, and a larger board may enable the bank to ensure more efficient and effective links with the economic context. The third is that our results suggest that the higher the percentage of degrees in economics held by members of the board, the higher the *LR* is. The percentage of degrees held in law is not statistically significant. Our results should be taken into consideration by regulators, by banks and by investors when facing the concept of board diversity and risk-aversion tendency; this aspect has to be considered when evaluating banks' robustness because they are one of the most important intermediaries on the market and act as the counterparts to different kinds of investors: corporate, public and retail investors.

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