



Women on corporate boards and firm's financial performance

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ABSTRACT

The European Commission has proposed that member countries develop their national self-regulation and governance initiatives to increase the number of women on corporate boards with the aim of promoting gender equality in the processes of decision-making. This has provoked some controversial opinions, which in turn has led to the search for factual data which may support the legal initiatives. In order to shed more light on this topic, this study investigates the influence of a higher percentage of women on the board of directors of companies (excluding financial companies) included in the index of the Spanish Stock Exchange IBEX35 for a fifteen-year period: 2003–2017. To do this, we use a two-stage instrumental variables (IV) regression to address endogeneity and reverse causality problems. Moreover, we study the influence of a mandatory law on female presence on company boards by using a panel data methodology. The findings of this study show that the increasing number of women on boards is positively related to higher financial performance. Moreover, as expected, the gender mandatory law boosts the female proportion on boards of directors. Consequently, there are valid business as well as ethical arguments to support mandatory gender legislation.

Introduction

Diversity among board members means heterogeneity, which can be measured with either visible characteristics (race, age, gender, etc.) or intangible items (education, occupational background, etc.) (Rao & Tilt, 2016). The scarce traditional representation of women in management positions is due to the so-called *glass ceiling*, namely, an invisible cultural barrier which prevents trained women from holding responsibility in organizational positions (Mateos del Cabo, Gimeno, & Nieto, 2012). Equal opportunities in both social and economic circles is a basic human right. Furthermore, the systematic exclusion of women, who constitute half of society, leads to sub-optimal boards of directors (Ben-Amar, Chang, & McIlkenny, 2017).

Gender diversity in the composition of company boards and its implications for the firm's financial performance is an important consideration and a prominent line of current research on the effect of related legal initiatives implemented in several countries (Velte, 2017). Some governments have enacted certain laws to promote gender equality, either mandatory or not, whilst others have only implemented some recommendations or disclosure requirements to companies. Table 1 shows the legislation governing gender diversity on the boards of directors and the proportion of women on these boards from 2007 to 2017 in the main European countries.

After an increase of 14.9% during the considered period, the

European Union has reached an average of 25.3% of women on company boards. However, this situation differs from country to country, both in 2007 and in 2017. For example, in 2007 Norway held the top position, with 34.2%, whilst Portugal and Italy were ranked in the lowest places, both with 3.2%, which represented a significant difference. At the present time, France and Norway have the greatest percentage of women on company boards with 43.4% and 42.1% respectively. At the other extreme, Greece and Portugal exhibit the lowest percentages: 11.3% and 16.2% respectively. It is worth mentioning that France is the country which has experienced the biggest growth, 34.6%, in the analyzed period, whilst Norway has increased only 7.9%, due to the fact that it is a country which has been sensitive to gender equality for many years. Summarizing, the countries with quotas established by mandatory laws, such as France, Norway, Italy or Germany, have more women on boards of directors. Moreover, those countries with a deep-rooted tradition of gender equality, such as Norway, Finland and Sweden, are in the second, third and fifth world positions respectively, according to the global index published by the World Economic Forum in The Global Gender Gap Report 2017. In Spain, however, the target quota of 40% has not been reached, even though the law is mandatory, which explains its 24th position. The reason is twofold. First, Spanish society maintains deep-rooted attitudes towards the role of women. Second, the non-observance of the law does not entail any sanction. Spain has opted for the so-called “soft quota”, like the Netherlands,

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Table 1

European legislation for gender diversity and proportion of women as members of boards of directors.

Source: [Isidro and Sobral \(2015\)](#), Database Gender Statistics of the European Institute for Gender Equality and The Global Gender Gap Report 2017.

Country	Legislation	Sanctions	Gender quota target and expected date	% of women on the boards					Increase
				2007	2010	2013	2016	2017	2007–2017
Austria	Mandatory	No	30% in 2018	5.0	8.7	12.6	18.1	20.0	15.0
Belgium	Mandatory	Yes	33% in 2017	6.4	10.5	16.7	28.6	30.7	24.3
Denmark	No	No	No	15.3	17.7	22.9	27.1	30.3	15.0
Finland	No	No	No	18.5	25.9	29.8	30.1	32.8	14.3
France	Mandatory	Yes	40% in 2017	8.8	12.3	29.7	41.2	43.4	34.6
Germany	Mandatory	No	30% in 2010	11.3	12.6	21.5	29.5	31.9	20.6
Greece	No	No	No	11.2	6.2	8.4	9.1	11.3	0.1
Ireland	No	No	No	6.7	8.4	11.1	16.5	17.6	10.9
Italy	Mandatory	Yes	33% in 2015	3.2	4.5	15	32.3	34.0	31.8
Netherlands	Mandatory	No	30% in 2015	13.9	14.9	25.1	27.5	29.5	15.6
Norway	Mandatory	Yes	40% in 2008	34.2	38.9	42.0	42.6	42.1	7.9
Poland	No	No	No	11.9	11.6	12.3	18.8	20.1	8.2
Portugal	Mandatory	No	33% in 2020	3.2	5.4	8.8	14.3	16.2	13.0
Spain	Mandatory	No	40% in 2015	6.2	9.5	14.8	20.3	22.0	15.8
Sweden	No	No	No	23.8	26.4	26.5	36.9	36.3	12.5
United Kingdom	Non-mandatory	No	25% in 2015	11.4	13.3	21.0	27.0	27.2	15.8
European Union	–	–	–	10.4	11.9	17.8	23.9	25.3	14.9
United States	No	No	No	–	–	–	–	16.4	–
Japan	No	No	No	–	–	–	–	3.4	–
China	No	No	No	–	–	–	–	9.4	–

since the law does not have negative consequences for those companies which do not reach the legally imposed target. Spanish law only provides the incentive that the government may show preference in awarding public contracts to companies which follow its guidelines. Nevertheless, the presence of women on boards has increased by 15.8%.

The arguments in favor of gender diversity on company boards can be classified into two main groups: ethical and economic ([Mateos del Cabo et al., 2012](#); [Pletzer, Nikolova, Kedzior, et al., 2015](#)). From an ethical perspective, gender equality is considered as a target itself, i.e., if the presence of women increases, the goal is achieved, independently of the company's profit. From an economic perspective, the gender quota based on law has been widely questioned, by arguing that women must be promoted on the basis of their education and professional experience, since otherwise a company might suffer a loss in its profitability. Therefore, this paper aims to investigate whether the increasing presence of women on company boards results in a higher financial performance. If this is so, a business case might be argued to enact gender laws, which will allow achieving gender equality more quickly and effectively.

However, empirical evidence is not conclusive. In effect, despite the fact that previous studies have found a positive correlation between gender diversity and financial performance ([Campbell & Mínguez-Vera, 2008](#); [Reguera-Alvarado, De Fuentes, & Laffarga, 2017](#)), other works reveal a negative link ([Adams & Ferreira, 2009](#); [He & Huang, 2011](#)) and some of them even show no relationship between the two analyzed variables ([Carter, D'Souza, Simkins, et al., 2010](#); [Rose, 2007](#)). Once the findings derived from previous research is considered, the main objective of this paper is to provide some evidence on the positive effect of the presence of women on boards on a firm's financial performance by analyzing the top Spanish companies during the period 2003 to 2017. In addition, the paper proves the effect of a mandatory gender law on the percentage of women on company boards, and more specifically the influence of the Spanish law enacted in 2007 on the considered sample. To do this, a two-stage instrumental variables (IV) regression and a panel data methodology have been employed.

This paper makes the following contributions to the existing literature. First, it provides empirical evidence on the Spanish market, which has been scarcely analyzed. Until now, most studies analyze the American and Anglo-Saxon markets. Moreover, this paper considers a wide and recent time interval (from 2003 to 2017), whilst previous

studies use shorter and older periods. Second, the mandatory gender laws have been questioned by arguing that ethical reasons are not enough to force companies to increase the number of women in management positions. In effect, Spain was, after Norway, the second European country to enact a law requiring companies to have a 40% quota of women on their boards. Therefore, it would be appropriate to ascertain the economic effectiveness of women on company boards. Third, the paper analyzes whether the percentage of women on boards affects the firm's financial performance, by considering endogeneity and reverse causality problems between the explanatory and explained variables.

The remainder of this paper is organized as follows. The next section presents some previous empirical evidence on this topic and provides the theoretical framework which supports the research hypothesis. The section which follows describes the database, the variables and the methodology used. Then we present the obtained results and, finally, we discuss the results and provide the main conclusions derived from this research.

Literature review and theoretical framework

Gender diversity on boardroom and company financial performance

The board of directors is the main committee of a company's management and representation, defines its goals, policies and strategies, and monitors senior management. Obviously, the characteristics of its company board members, such as education, background, age, gender, etc., could influence performance.

Gender diversity is a current and controversial topic in corporate governance, since it offers important advantages, but also imposes some drawbacks. In general, heterogeneous groups introduce different perspectives caused by different skills and experiences ([Farrell & Hersch, 2005](#); [Francoeur, Labelle, & Sinclair-Desgagné, 2008](#); [Rose, 2007](#)); this allows a more comprehensive analysis of situations, and thereby permits the consideration of alternative, creative and innovative solutions for complex problems ([Pletzer et al., 2015](#)), thus reducing premature decisions ([Carter et al., 2010](#)). Applied to the context of gender diversity, women are different from their male colleagues in several aspects. For example, women are more risk-averse and less radical in the process of decision-making than men ([Croson & Gneezy, 2009](#); [Jianokoplos & Bernasek, 1998](#)). However, this perception is considered

by some authors as a stereotype and as a major cause of the so-called “glass ceiling” on corporate promotion ladders (Johnson & Powell, 1994). In this way, in the context of financial decisions, the pre-conceptions concerning the risk attitudes of female investors and managers may be more prejudice than fact, and they would be a source of statistical discrimination against women in financial and labor markets (Schubert, Brown, Gysler, & Branchinger, 1999). Analogously, women are considered more sensitive to corporate social responsibility and environmental politics (Francoeur, Labelle, Balti, et al., 2017; Nielsen & Huse, 2010), and more participative and democratic (Eagly, Johannsen-Schmidt, & Van Engen, 2003). Additionally, women also have a higher ethical judgment (Akaah, 1989) and philanthropy (Bear, Rhaman, & Post, 2010), and better relations with suppliers, consumers and organizations, all of which leads to a major understanding of the market (Miller & Triana, 2009). A high percentage of women reinforces the independence of boards (Adams & Ferreira, 2009), the quality of the financial and corporate social responsibility reports, as well as internal and external audits (Velte, 2017), and is in favor of reducing earnings-management practices (Gill de Albornoz & García, 2007). Female presence is positively assessed by investors, who consider this as a sign of equality. Moreover, it increases the firm's market value and improves its external legitimacy and organizational reputation (Bear et al., 2010; Rose, 2007).

Obviously, homogeneous groups have a more fluid and frequent communication, less divergence in opinions and, therefore, conflicts are scarce and decision-making will usually be less time-consuming and, consequently, more effective (Earley & Mosalowski, 2000). It is also proved that women present a higher turnover and absenteeism, which increase the costs of the company (Cox & Blake, 1991). Additionally, if women were hired as “tokens”, and not because of their competence, company performance might be negatively affected. In fact, if men perceived women as “tokens”, it could be very possible that these would be marginalized on the board and their opinions not taken into account (Kanter, 1977). In this case, interpersonal conflicts might arise, which would result in a lack of cohesion between board members and a delay in decision-making. Thus, the effectiveness of the board as a whole would be diminished (Knigh, Pearce, Smith, et al., 1999).

Previous literature is not conclusive with respect to the relation between gender diversity on boards and a firm's financial performance. On the contrary, empirical evidence shows a variety of findings. A wide range of studies conclude that there exists a positive link between the percentage of women on boards and the firm's market value, by using Tobin's Q (Bonn, 2004; Campbell & Mínguez-Vera, 2008; Carter, Simkins, & Simpson, 2003; Nguyen & Faff, 2007; Reguera-Alvarado et al., 2017) or other accounting measures, such as the return on assets (ROA) or the return on equity (ROE) (Erhardt, Werbel, & Shrader, 2003; Francoeur et al., 2008; Krishnan & Park, 2005). In contrast, other analyses find that gender diversity on boards of directors is negatively related to the market value (Ahern & Dittmar, 2012), to the accounting returns (He & Huang, 2011; Shrader, Blackburn, & Iles, 1997) or to both parameters (Adams & Ferreira, 2009; Bhoren & Strom, 2010). In addition, several researchers have found that female representation on the boards is unrelated to the firm's financial performance (Carter et al., 2010; Haslam, Ryan, Kulisch, et al., 2010; Rose, 2007).

These different findings could be due to the fact that they refer to different countries and also consider diverse time periods. In addition, the particular characteristics of the environment may give rise to mixed results (Grosvold, Brammer, & Rayton, 2007). Moreover, another possible cause could be the low proportion of women on boards or the heterogeneity on the chosen variables and methods. Finally, it is very probable that there are influential and unobserved variables in the considered relationship (Campbell & Mínguez-Vera, 2008).

To conclude, the ambiguity of the effect of gender diversity on boards of directors on financial performance and the scarce studies about mandatory gender laws justify an empirical research to shed light in this topic.

Theoretical framework and development of hypothesis

The existing literature on this topic offers a number of well-established theories which support the view that gender diversity on company boards influences financial performance. The most common position is to consider several theories at the same time for comparative and integrative purposes (Nicholson & Kiel, 2007). Thus, we adopt a multi-theoretical approach in order to collect the contribution which each theory can offer to our research. These theories are discussed below.

Agency theory is the most frequently considered theory when the existence of gender diversity on a board of directors is related to financial or market measures (Terjensen, Sealy, & Singh, 2009). This theory maintains that shareholders (principal) have as priority aim the maximization of the company's value, but managers (agent), who really make the strategic decisions, could act on their own benefit and against the general interests of the owners (Fama, 1980; Fama & Jensen, 1983; Jensen & Meckling, 1976). Hence, managers should be dissuaded from carrying out those actions which pursue their own individualistic goals and economically harm the shareholders (Eisenhardt, 1989), thus generating agency costs. In this way, the role played by the boards is essential to control and monitor managerial decisions (Gillan, 2006; Hart, 1995). When the skills, background and knowledge of board members are broader, the control is more effective (Hillman & Dalziel, 2003), and therefore gender diversity on boards is linked to more independence and improves the monitoring tasks (Adams & Ferreira, 2009; Carter et al., 2003; Francoeur et al., 2008). Consequently, agency costs are reduced and profitability increases. In our sample, most women on boards are outside directors, and for this reason they bring more independence to the board and enable better monitoring, since outside directors are more independent than their insider counterparts, who have strong links with managers (Raheja, 2005).

Resource dependence theory provides the most accepted allegation for a business case based on gender diversity. The board is considered as an essential link between the company and the necessary resources to maximize its financial performance (Aldrich & Pfeffer, 1976; Johnson, Daily, & Ellstrand, 1996; Pfeffer, 1973). The board of directors is itself an important resource for the company due to its relation with the external environment (Palmer & Barber, 2001), providing information, creating channels of communication with preeminent stakeholders and legitimizing the entity (Luckerath-Rovers, 2013), and this could be a sustainable competitive advantage not imitable by competitors (Barney, 1991). Board diversity may bring more resources to the company, as wider knowledge about customers and the industry, diverse credit sources, etc., will lead to better company performance (Stiles, 2001). Accordingly, female directors bring on increase to the number of links, resources and views, in addition to external legitimacy, and show that the firm promotes gender equality, and all this increases the value of the company. Women have certain traits which make them more likely to be appointed to some committees, such as corporate governance, audit, human resources, etc. (Peterson & Philpot, 2007). In addition, companies trading in complex environments, where wider views and links are needed, usually have a higher percentage of women on their board of directors (Hillman, Shropshier, & Cannella, 2007). Moreover, an important resource for many firms is a strong link with government, which is a significant working relationship and earns a substantial percentage of income (Malatesta & Smith, 2014). Although Spanish law does not explicitly penalize firms which fail to comply with the quota, it introduces a promise of incentive in the way that non-compliant firms will not be prioritized when government contracts are awarded. As result, and according with the principles of the Resource Dependence Theory, firms recruiting women to their boards will also improve their probability of obtaining public contracts and, consequently, of improving their financial performance.

Stakeholder theory states that not only should the company consider the interests of shareholders, but that it should also pay attention to the

requirements of other stakeholders, namely, suppliers, customers, employees, banks and, in general, those linked in any way to the firm, because they all contribute the creation of value for the company (Hillman & Keim, 2001; Huse, 2003; Johnson & Greening, 1999; Pesqueux & Damak-Ayadi, 2005). In this way, the incorporation of women in higher administration is viewed as an integrative sign which enhances the propensity of the company to social responsibility, thus increasing its value (Kaufman & Englander, 2011; Oakley, 2000; Webb, 2004).

The *resource-based view* is a conceptual framework which stresses diversity as a source of competitive advantage (Grant, 1991), because a human team is not perfectly imitable, and is therefore not strategically replaceable. Hence, the relative percentages of men and women on the board imply a particular source of value for the company (Shrader et al., 1997; Watson et al., 1993). In fact, existing literature shows that gender-diverse teams obtain greater results than single-gender teams (Desvaux, Devillard-Hoellinger, & Meaney, 2008; Orlitzky & Benjamin, 2003; Stewart, 2006).

Based on the former arguments, we predict that a higher percentage of women present on the board of directors will lead an improvement in a company's financial performance. In order to test this theory, we formulate the following research hypothesis:

Hypothesis 1. The percentage of women on the board of a company is positively related to its financial performance.

Data and methodology

The dataset

Our sample is composed of Spanish firms listed on the Madrid Stock Exchange and included in the IBEX35 index. These firms are the most important in Spain and their information on corporate governance is available from the CNMV (Securities Markets Commission).

The IBEX35 index includes the 35 most liquid stock listed on the Stock Exchange Interconnection System of the four Spanish Stock Exchanges. We have analyzed the fifteen-year period 2003–2017 but have excluded financial firms because of their particular financial statements, which are not comparable with other companies (Gallego-Álvarez, García-Sánchez, & Rodríguez-Domínguez, 2010; Jackling & Johl, 2009; Reverte, 2009; Rodríguez Fernández, Fernández Alonso, & Rodríguez Rodríguez, 2013). Consequently, the 29 non-financial firms which in August 2018 are included in the IBEX35 have been studied during the stated period, and hence the final sample contains 340 observations. Table 2 provides an overview of the sample composition by sector and year.

This sample was selected for several reasons. Firstly, we are analyzing the largest, the most active and therefore the most significant companies in the current Spanish Stock Market. Secondly, these companies are especially under observation for gender-regulation compliance and, for this reason, the number of women on the boards is likely to be the result of awareness and not a mere coincidence. Thirdly, the chosen period allows us to observe the evolution of women on company boards as a consequence of a given “Law of Equality” and its influence on financial performance. Accordingly, our analysis will be useful to derive some conclusions based on the most visible Spanish companies, and such considerations could be useful for smaller or less significant firms.

The information on the corporate governance composition of the companies in the sample was extracted by the researchers from the annual reports, which are deposited in the CNMV, and the financial information was obtained from de SABI (System of Analysis of Iberian Balance Sheets provided by Bureau Van Dijk) database.

Table 3 provides a summary of the mean of board directors, the mean of women directors and the percentage of women over the total. We can observe that the average size of the board has remained

Table 2

Description of the sample by sector and year.

Year	Sector 1	Sector 2	Sector 3	Sector 4	Sector 5	Sector 6	Total
2003	2	5	1	5	0	1	14
2004	2	6	1	5	0	1	15
2005	3	6	1	5	1	1	16
2006	3	7	1	5	1	2	19
2007	3	7	1	6	2	2	21
2008	3	7	2	6	2	2	22
2009	3	7	2	6	2	2	22
2010	3	7	3	6	2	2	23
2011	5	7	3	6	2	2	25
2012	5	7	3	6	2	2	25
2013	5	7	3	6	2	2	25
2014	5	7	3	6	3	2	26
2015	6	7	4	6	3	2	28
2016	6	7	4	6	3	3	29
2017	6	7	4	6	3	3	29
Total	60	101	36	86	28	29	340

Sector 1: Consumer Services - Sector 2: Basic Materials, Industry and Construction - Sector 3: Technology and Telecommunications – Sector4: Petrol and Power – Sector 5: Financial Services and Real State – Sector 6: Consumer Goods.

Table 3

Composition of boards of directors.

Year	Mean directors	Mean women directors	% women directors
2003	13.789474	0.368421	0.034273
2004	13.476190	0.333333	0.030598
2005	13.333333	0.428571	0.040849
2006	13.043478	0.565217	0.047736
2007	13.260870	0.695652	0.056792
2008	13.347826	1.000000	0.081378
2009	13.608696	1.173913	0.091984
2010	13.375000	1.333333	0.107361
2011	13.384615	1.423077	0.115996
2012	13.230769	1.500000	0.121671
2013	13.153846	1.730770	0.133867
2014	12.814815	2.000000	0.163398
2015	12.724138	2.172414	0.172745
2016	12.827586	2.379310	0.182799
2017	12.793103	2.896551	0.224421

practically stable, with a small decrease of one member in the analyzed period. The enactment of the gender law in 2007 led to a gradual increase in the number of women: the average number of women on boards was below one in 2007 and now is almost three, which has meant an increase from 5.67% to 22.44% in the last ten years. Despite this increase due to the legislation on gender, the presence of women in boards remains low and is still far from 40%. That is to say, barely half of the proposed objective has been reached. In effect, Table 3 confirms that women are under-represented on boards, which is in line with the findings of other studies (Campbell & Mínguez-Vera, 2008; Isidro & Sobral, 2015; Joecks, Pull, & Vetter, 2013; Mateos del Cabo, Gimeno, & Escot, 2011; Reguera-Alvarado et al., 2017). Specifically, women hold < 12% of board seats in the considered period, but not all of these have the same influence, since only 0.46% of executive board members are women, the percentage of female owners in this area is 7.48% and, finally, the female independent board members represent 17.73%. That is, 76.03% of women board members are independent members and only 0.62% of women are executives within the firm. In addition, as shown in Table 1, Spain is the country whose mandatory law is furthest away from the proposed aim, since France, Germany, Italy, Netherlands and Poland have reached their respective quotas, whilst Belgium has almost reached 33%.

Table 4
Definition of variables.

Abbreviation	Variable	Definition
TobinQ	Tobin's Q	Stock price/replacement value
PWomen	Women board members	% board members who are women
Blau	Blau index	Blau index of diversity
Shannon	Shannon index	Shannon index of diversity
LnAssets	Company size	Logarithm of total assets
LnSales	Company sales	Logarithm of total sales
IBEX	IBEX35 index	Variation of the IBEX35 index
BSize	Board size	Number of board members
LnDir	Compensation	Logarithm of the board members' compensation
Law	Mandatory law	Dummy variable, 0 period 2003–2007 and 1 period 2008–2017
Sector	Sectors of activity	Dummy variable for each sector considered

Variable description

In the empirical analysis, the dependent variable is Tobin's Q, which is a well-known measure of financial performance. On the other hand, the independent variable is the gender diversity on company boards, which will be represented by three different proxy variables: the percentage of women on the board, the Blau index and the Shannon index. Finally, as control variable we consider company size, company sales, the volatility of the IBEX35 index and several proxies to the sector to which the firm belongs. Table 4 provides a summary of the employed variables and their definitions.

Tobin's Q

In previous studies, company performance has been quantified by using different measures, which can be classified into two groups: accounting returns and market performance. The first group (accounting measures), mainly ROA (Return On Assets) and ROE (Return On Equity), measure how a firm uses its assets and investments to yield profitability and, since they are based on past events, it represents short-term financial performance (Gentry & Shen, 2010). The second group reflects external perceptions and expectations of a firm's future or long-term value (Post & Byron, 2015). Tobin's Q (denoted by TobinQ), which is defined as market-to-book value ratio (Huselid, 1995; Wiggins & Ruefli, 2002), is a market-based company performance index. For this reason, it is a good proxy for reflecting the future potential of a firm's performance (Haslam et al., 2010; Montgomery & Wernerfelt, 1988). In contrast to accounting measures, neither tax regulations nor accounting conventions influence Tobin's Q and, moreover, it is an objective index, because it does not derive from self-reported data (Pletzer et al., 2015). In addition, Tobin's Q presents the advantage of being a standardized measure with an easy interpretation: if the ratio is greater than one, the investors consider that the firm is employing its resources efficiently, whilst if the ratio is less than one, the material and intellectual resources are considered underutilized. As a consequence, Tobin's Q is a measure widely used in numerous previous studies (Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Carter et al., 2003; García-Castro, Ariño, & Canela, 2010; Isidro & Sobral, 2015; López & Morros, 2014; Reguera-Alvarado et al., 2017; Rose, 2007).

Percentage of women

The percentage of women (denoted by PWomen) is the proportion of women on company boards with respect to the total number of board members. Since board decisions are the consequence of collective discussion involving all directors, an overall diversity measure can be a good indicator to identify the combined effect of diversity on performance (Rao & Tilt, 2016; Velte, 2017). The percentage of women on

boards is a measure commonly used in the existing literature on this topic (Adams & Ferreira, 2009; Ben-Amar et al., 2017; Campbell & Mínguez-Vera, 2008; Isidro & Sobral, 2015; Reguera-Alvarado et al., 2017; Ward & Forker, 2017).

Blau index

The Blau index of heterogeneity (denoted by Blau) is a suitable measure of diversity because it satisfies the four following criteria: complete homogeneity is represented by the value zero, greater diversity is indicated by larger numbers, the index does not take negative values and the index is bounded (Miller & Triana, 2009). Blau (1977) stated that the diversity of a group is given by $1 - \sum_{i=1}^n p_i^2$, where, in our case, the number n of categories (women and men) is equal to 2 and p_i is the percentage of board members in each category (ratios of women and men directors). In this way, the Blau index varies from 0 (when there is only one gender represented on the board) to 0.5 (when the number of men and women is the same). This index has been widely used in previous research (Bear et al., 2010; Ben-Amar et al., 2017; Campbell & Mínguez-Vera, 2008; Joecks et al., 2013; Miller & Triana, 2009; Reguera-Alvarado et al., 2017).

Shannon index

Shannon index (denoted by Shannon) is defined as $\sum_{i=1}^n p_i \cdot \ln p_i$, where i , n and p_i have the same meaning as in the Blau index and therefore varies from 0 (when the members are either all male or all female by considering that, in this case, $p_i \cdot \ln p_i = 0$, although $\ln 0$ is not defined) to 0.6931 (when both genders are represented in the same proportion). The properties of this index are similar to the Blau index, even though it will always be greater and more sensitive to small differences in the gender composition of boards (Campbell & Mínguez-Vera, 2008). Recent studies, such as Reguera-Alvarado et al., 2017, include this index in the analysis of gender diversity.

Company size

Following prior research (Campbell & Mínguez-Vera, 2008; Gallego-Álvarez et al., 2010), company size is measured as the natural logarithm of the total assets (represented by LnAssets) at the end of the period. Economies of scale are obtained in large companies, because they can hire more experienced managers (Ward & McKillop, 2005), which positively affects their financial performance (Ward & Forker, 2017); otherwise, a larger size involves more complexity and higher costs of monitoring, leading to a deterioration in company performance (Campbell & Mínguez-Vera, 2008; Adams & Ferreira, 2009; Carter et al., 2010; Böhm and Ström, 2010; Isidro & Sobral, 2015; Reguera-Alvarado et al., 2017).

Company sales

We include the logarithm of sales (denoted by LnSales), as indicated by previous research (Adams & Ferreira, 2009; Reguera-Alvarado et al., 2017).

Volatility of the IBEX35

In order to control the influence of the economic cycle on financial performance, we have considered an additional variable: the volatility of the IBEX35 index, which is measured as the percentage of variation of such index (IBEX). The evolution of this variable for the analyzed period (2003–2017) is shown in Table 5.

Sector

We have introduced the sector in which the company operates through dummy variables. According to the classification of the stock market, which was reorganized on 1st January 2005, six basic sectors

Table 5
Evolution of the IBEX35 index.

Year	IBEX35	% variation IBEX35
2017	10,043.90	7.40
2016	9352.10	-2.01
2015	9544.20	-7.15
2014	10,279.50	3.66
2013	9916.70	21.42
2012	8167.50	-4.66
2011	8566.30	-13.11
2010	9859.10	-17.43
2009	11,940.00	29.84
2008	9195.80	-39.43
2007	15,182.30	7.32
2006	14,146.50	31.79
2005	10,733.90	18.20
2004	9080.80	17.37
2003	7737.20	-28.17
2002	6036.90	

have been considered: two related with energy and basic industry (petrol and power, on the one hand, and basic materials, industry and construction, on the other hand), two linked to consumption (consumer goods and consumer services), one including financial activities (financial services and real estate) and another referring to the activities related to technology and telecommunications (technology and telecommunications).

Instrumental variables

Previous research has revealed that there are endogeneity and reverse causality problems affecting the relationship between gender diversity proxies and financial performance (Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Gul, Srinidhi, & Ng, 2011; Srinidhi, Gul, & Tsui, 2011), which may lead to biased and inconsistent estimates (Ben-Amar et al., 2017). In order to solve these problems, each diversity gender variable is estimated through instrumental variables before being incorporated into the main model. Now the concern is to find suitable exogenous instruments, since they have to be correlated with the endogenous variable (PWomen, Blau and Shannon), but not correlated with the error term in the main model, i.e., in the financial performance equation (Baum, Schaffer, & Stillman, 2007). In order to accomplish these restrictions, we hypothesize that gender diversity proxies can be instrumentalized by three variables: the board size (BSize), the board members' compensation (LnDir) and the existence of a mandatory law (Law).

Board size

The more members there are on the board, the higher the likelihood that more women will be appointed (Ben-Amar et al., 2017). Nevertheless, a larger board can have a greater number of female members, in absolute value, but a lower percentage of women. Since our gender diversity proxies are obtained as a relative measure, we expect a negative relation between the independent variables and the board size.

Board members' compensation

The sign of the correlation between the board members' compensation and the percentage of women on boards is not clearly established by the theory, since well-governed firms are not willing to pay high remunerations, when they should do the opposite and compensate their board members for the extra risk derived from limited-liability constraints (Adams & Ferreira, 2009). In fact, Reguera-Alvarado et al. (2017) find a negative and significant effect of compensation on gender diversity, whilst Adams and Ferreira's research detects evidence that higher compensation implies relatively more female directors. We consider the natural logarithm of board members' compensation (LnDir).

Mandatory law

As a consequence of the concern about gender diversity, some countries have passed laws to increase the presence of women in social, political and economic areas. As a result, in 2007 Spain passed the so-called "Law of Equality", which proposed that a gender quota of at least 40% of board members should be women. This is a mandatory law, but it does not impose any sanction in the case of non-compliance. The number of women on boards has increased as a result of this law, although not at the desired pace. For this reason, we have considered the instrumental variable Law as a dummy variable (Reguera-Alvarado et al., 2017), which divides the total analyzed period (2003–2017) into two sub-periods, assigning the value 0 before the enactment of the law (2003–2007) and the value 1 after this year (2008–2017).

Methodology

Following Reguera-Alvarado et al. (2017), we implemented two methodologies in order to study the effect of gender diversity on financial performance and the effect of the Spanish mandatory law on gender diversity on boards.

Firstly, in order to address endogeneity and reverse causality problems between each of the gender diversity variables (PWomen, Blau and Shannon) and the financial performance (TobinQ), we applied a two-stage instrumental variable (IV) regression. In the first stage of the instrumental variables (IV) regression, which is based on ordinary least-squares (OLS), we hypothesize that the board size (BSize), the board members' remuneration (LnDir) and the mandatory law (Law) could be an instigator for gender diversity (PWomen, Blau and Shannon). We test whether the endogenous regressors (gender diversity proxies) can really be treated as exogenous and whether these instruments are in fact valid tools, by using the test proposed by Baum et al. (2007) and the Sargan-Hansen test.

In a second stage, the generalized method of moments (GMM) is applied and we use the dependent variable lagged one period to manage the problem of omitted variables. Thus, company performance (TobinQ) is a function of gender diversity on their boards (measured as PWomen, Blau or Shannon), company size (LnAssets), company sales (LnSales), the variation of the IBEX35 index (IBEX), the sector in which the company operates (dummy variables) and the error term or random disturbance.

Secondly, a panel data methodology has been implemented to study the effect of the Spanish law of gender diversity, enacted in 2007, on the proportion of women on the boards of companies. The possible unobservable heterogeneity among those of the sample may be controlled by using panel data. If such unobservable heterogeneity were correlated with the independent variables, estimation by fixed effect would be appropriate; otherwise, the random effects model should be used instead (Arellano & Bover, 1990). In order to test the existence of this correlation, the Hausman test has been implemented, in which the null hypothesis is that the coefficients from fixed and random effects are not systematically different, and therefore the coefficients of the random effects model are consistent. Hence, if the null hypothesis is rejected, fixed effects would be the chosen option. Accordingly, we perform the Hausman test to select the appropriate method in our sample.

Results

Descriptive statistics and correlations

The descriptive statistics and correlations are presented in Tables 6 and 7 respectively. During the considered period, the average number of women on boards (PWomen) is 11.38%, a number higher than 3.28% (Campbell & Mínguez-Vera, 2008) and 6.93% (Reguera-Alvarado et al., 2017), obtained in previous periods in Spain, which demonstrates that the percentage of women is increasing, although women remain

Table 6
Descriptive statistics.

Variable	Mean	Standard deviation	Minimum	Maximum
TobinQ	0.8684868	0.9891741	0.027	5.886
PWomen	0.1138491	0.1041865	0	0.5
Blau	0.1828341	0.1505182	0	1
Shannon	0.2944209	0.2139336	0	0.6931472
LnAssets	21.87414	2.155491	7.602401	25.25714
LnSales	19.7563	2.138536	10.27505	23.12143
IBEX	3.023772	19.99186	-39.43078	31.79273
BSize	13.57446	3.421557	7	24
LnDir	12.57446	1.570089	0	15.26374
Law	0.6549296	0.4759502	0	1

This table shows the descriptive statistics (mean, standard deviation, minimum and maximum) of the variables during the period 2003–2017.

underrepresented in management positions. Meanwhile, in the United States during the period 1996–2003, women represented 8.5% of board composition (Adams & Ferreira, 2009) and in Canada during the period 2008–2014 the figure was 16% (Ben-Amar et al., 2017) and in the credit union sector in Northern Ireland 43% during the period 2002–2010 (Ward & Forker, 2017). The average board size (BSize) is 13.57 members, with a minimum of 7 and a maximum of 24; this figure is not very far from 11.86 in Canada (Ben-Amar et al., 2017) or 16.66 in Northern Ireland (Ward & Forker, 2017), but noticeably > 9.38 in United States (Adams & Ferreira, 2009). Regarding the average size of companies (LnAssets) and sales (LnSales), our sample presents average values, 21.87 and 19.76 respectively larger than those obtained by Reguera-Alvarado et al. (2017), which were 13.84 and 13.21 respectively; the reason for this is, without a doubt, that our sample represents the most relevant companies listed in the Spanish stock exchange market, namely, the companies included in the IBEX35 index.

With regard to the correlation analysis, the financial performance (TobinQ) is, as expected, positively correlated with the greater presence of women on boards, represented by the PWomen, Blau and Shannon variables. Moreover, the dependent variable is positively correlated with company sales (LnSales) and market volatility (IBEX), unlike company size (LnAssets), which shows a negative and significant correlation. A significant correlation between the three instrumental variables (BSize, LnDir and Law) and the endogenous variables (PWomen, Blau and Shannon) can also be observed. Finally, it is

Table 7
Pearson correlations.

	Tobin Q	PWomen	Blau	Shannon	LnAssets	LnSales	IBEX	BSize	LnDir
1. TobinQ	1.0000								
2. PWomen	0.0908 (0.1019)	1.0000							
3. Blau	0.0943* (0.0892)	0.9169*** (0.0000)	1.0000						
4. Shannon	0.1028* (0.0638)	0.9526*** (0.0000)	0.9204*** (0.0000)	1.0000					
5. LnAssets	-0.2602*** (0.0000)	0.0175 (0.7524)	0.0046 (0.9339)	0.0118 (0.8320)	1.0000				
6. LnSales	0.1847*** (0.0008)	0.0975* (0.0787)	0.0570 (0.3045)	0.1316** (0.0174)	0.4968*** (0.0000)	1.0000			
7. IBEX	0.0958* (0.0843)	-0.1529*** (0.0057)	-0.1504*** (0.0065)	-0.1840*** (0.0008)	-0.0758 (0.1721)	-0.1502*** (0.0066)	1.0000		
8. BSize	-0.2909*** (0.0000)	-0.2046*** (0.0002)	-0.1671*** (0.0025)	-0.1869*** (0.0007)	-0.5504*** (0.0000)	-0.2048*** (0.0002)	0.0378 (0.4961)	1.0000	
9. LnDir	0.0863 (0.1200)	0.1094** (0.0484)	0.1160** (0.0363)	0.1222** (0.0274)	0.4215*** (0.0000)	0.2766*** (0.0000)	-0.1273** (0.0215)	0.1271** (0.0217)	1.0000
10. Law	-0.0733 (0.1868)	0.4355*** (0.0000)	0.4146*** (0.0000)	0.4891*** (0.0000)	0.1672*** (0.0024)	0.2862*** (0.0000)	-0.5159*** (0.0000)	-0.0526 (0.3440)	0.2167*** (0.0001)

n = 326 observations.

*** Indicates a significance of < 1%.

** Indicates a significance of < 5%.

* Indicates a significance < 10%.

Table 8
Results of test of endogeneity.

		PWomen	Blau	Shannon
Baum et al. test*	Value test	5.438	5.236	4.520
	p Value	(0.0197)	(0.0221)	(0.0335)
Sargan-Hansen test**	Value test	0.574	0.376	0.516
	p Value	(0.7507)	(0.8287)	(0.7728)

* Null hypothesis: the specified endogenous regressor can actually be treated as exogenous. Therefore, p value < 0.05 denotes that the variable is endogenous.

** Null hypothesis: the instruments are valid instruments. Therefore, p value > 0.05 denotes that the instruments considered are valid instruments.

important to notice that the high correlations between the proxy variables for gender diversity do not imply a problem in our analysis, since a different model is applied for each of these variables.

Estimation of instrumental variables (IV)

As formerly indicated, endogeneity and reverse causality problems between the gender diversity proxies and financial performance have been revealed in previous research. In order to discover whether they exist in our sample, we applied the test proposed by Baum et al. (2007) and the Sargan-Hansen test (Hansen, 1982), the results of which are shown in Table 8. The null hypothesis in the first test considers that the specified endogenous regressors can actually be treated as exogenous; however, the acceptance of the alternative hypothesis means that the variable can be treated as endogenous. On the other hand, the null hypothesis considered in the second test is that the instruments are valid; hence, as the null hypothesis has not been rejected, we consider that the proposed instruments are valid. As a result, the three gender diversity proxies (PWoman, Blau and Shannon) are endogenous in the considered financial performance model and the three proposed instruments (Bsize, LnDir and Law) can be accepted in the estimation.

Following previous research (Adams & Ferreira, 2009; Ben-Amar et al., 2017; Reguera-Alvarado et al., 2017), a two-stage instrumental variables (IV) estimation is implemented to deal with endogeneity and reverse causality problems. Table 9 shows the results of the first-stage instrumental variables (IV) estimation (OLS), where we can observe that board size and the enactment of the gender law are significant to

Table 9
First-stage instrumental variables (IV) estimation (OLS).

	PWomen	Blau	Shannon
Intercept	0.252247** (0.029)	0.429552*** (0.010)	0.5815832** (0.008)
BSize	-0.0058671** (0.011)	-0.0049323 (0.140)	-0.0093575** (0.033)
LnDir	0.0015074 (0.682)	0.0040348 (0.448)	0.0038480 (0.582)
Law	0.1174093*** (0.000)	0.1596265*** (0.000)	0.2499895*** (0.000)
TobinQ (1 lag)	-0.0078041 (0.263)	-0.0115394 (0.252)	-0.0237897* (0.073)
LnAssets	0.0041301 (0.530)	0.0054790 (0.564)	0.0039166 (0.754)
LnSales	-0.0088082** (0.018)	-0.0166456*** (0.002)	-0.0139325** (0.049)
IBEX	0.0004475 (0.172)	0.0005715 (0.228)	0.0008319 (0.181)
Industry dummies	Yes	Yes	Yes
R ²	0.2633	0.2396	0.3240
F-statistics	9.97** (0.0000)	8.91*** (0.0000)	13.02*** (0.0000)
Number of observations	302	302	302

*** Indicates a significance of < 1%.
** Indicates a significance of < 5%.
* Indicates a significance < 10%.

determine the presence of women on the boards, but whilst board size (BSize) has a negative impact, the gender law (Law) shows a positive influence. Moreover, the control variable which represents company sales (LnSales) exhibits a significant negative impact on the gender variables (*p* value inferior to 0.05 in each case). The R² coefficient predicts the following proportion of the variance: 0.2633 in the PWomen model, 0.2396 in the Blau index and 0.3240 in the Shannon index.

The results of the second-stage instrumental variables (IV) estimation (GMM estimation) are shown in Table 10, which reflects the

Table 10
Second-stage instrumental variables (IV) estimation (GMM).

	TobinQ (PWomen)	TobinQ (Blau)	TobinQ (Shannon)
Intercept	0.3075512 (0.425)	0.2599742 (0.508)*	0.2980501 (0.435)**
PWomen	1.043169*** (0.010)		
Blau		0.8089711*** (0.009)	
Shannon			0.5084667*** (0.009)
TobinQ (1 lag)	0.8634996*** (0.000)	0.8654034*** (0.000)	0.8681245*** (0.000)
LnAssets	-0.0196706 (0.284)	-0.234,633 (0.205)	-0.0192604 (0.289)
LnSales	0.0140920 (0.240)	0.0179569 (0.141)	0.0116890 (0.325)
IBEX	0.0072584*** (0.000)	0.0073187*** (0.000)	0.0073357*** (0.000)
Industry dummies	Yes	Yes	Yes
R ²	0.9024	0.9025	0.9025
F-statistic	255.58** (0.0000)	253.03*** (0.0000)	261.97*** (0.0000)
Number of observations	302	302	302

Pwomen, Blau and Shannon have been instrumented using the instrumental variables included in the first-stage OLS regression shown in Table 9: Board Size, LnDir and Law..

*** Indicates a significance of < 1%.
** Indicates a significance of < 5%.
* Indicates a significance < 10%.

Table 11
Second-stage instrumental variables (IV) non-linear specification.

	TobinQ (PWomen)	TobinQ (Blau)	TobinQ (Shannon)
Intercept	0.2426696 (0.529)	0.2182039 (0.577)*	0.2273658 (0.554)**
PWomen	0.252926 (0.817)		
PWomen ²	4.048624 (0.437)		
Blau		0.4060593 (0.642)	
Blau ²		1.26697 (0.623)	
Shannon			-0.0461441 (0.940)
Shannon ²			1.09228 (0.342)
TobinQ (1 lag)	0.8652221*** (0.000)	0.8674801*** (0.000)	0.8724306 (0.000)
LnAssets	-0.0173931 (0.339)	-0.0219124 (0.230)	-0.0166538 (0.359)
LnSales	0.0140441 (0.231)	0.0179456 (0.130)	0.0118757 (0.311)
IBEX	0.0071047*** (0.000)	0.0072358*** (0.000)	0.0071585*** (0.000)
Industry dummies	Yes	Yes	Yes
R ²	0.9023	0.9023	0.9024
F-statistic	253.74*** (0.0000)	253.59*** (0.0000)	254.10*** (0.0000)
Number of observations	302	302	302

Pwomen, Blau and Shannon have been instrumented using the instrumental variables included in the first-stage OLS regression: Board Size, LnDir and Law.

*** Indicates a significance of < 1%.
** Indicates a significance of < 5%.
* Indicates a significance < 10%.

influence of board gender diversity (represented by the variables PWomen, Blau and Shannon respectively) on financial performance (TobinQ), after each gender diversity proxy has been instrumentalized by BSize, LnDir and Law. The results obtained indicate that a greater presence of women on boards has a positive influence, at a 1% significance level, on financial performance, for each gender diversity proxy: PWomen, 1.043169 (*p* value 0.010), Blau, 0.08089711 (*p* value 0.009) and Shannon, 0.5084667 (*p* value 0.009). Furthermore, the previous year's performance (lagged TobinQ) and the volatility of the IBEX35 index (IBEX) have a positive impact on financial performance (TobinQ), also at a 1% significance level. For each considered proxy, the model adjustment is slightly above 90%.

Additionally, in line with previous literature, we tested whether the relationship between gender diversity on boardroom and financial performance is non-linear, by including a quadratic term for the gender diversity proxies (squared values of Pwomen, Blau and Shannon) (Ben-Amar et al., 2017; Joecks et al., 2013; Ward & Forker, 2017). Table 11 shows the results obtained in the second-stage instrumental variables (IV) estimation (GMM estimation) where, as can be observed, we have obtained no evidence of a non-linear relationship, since the coefficients of gender diversity proxies are not significant in this case; the rest of the variables show coefficients and significance levels similar to those previously obtained.

As a consequence, our findings confirm the hypothesis, since they reveal that a higher percentage of women on boards has a positive influence on financial performance, in line with previous studies (Campbell & Mínguez-Vera, 2008; Post & Byron, 2015; Reguera-Alvarado et al., 2017). However, there is no evidence about the existence of a critical percentage of women on boards to obtain the advantages of a more diverse composition, since the non-linear relationship is not significant.

Table 12
Effect of the mandatory law on gender diversity.

		PWomen	Blau	Shannon
t-Test	Mean 2007–2007	0.0425767	0.0836017*	0.1312166**
	Mean 2008–2017	0.1429565	0.2233603	0.3610730
	Mean difference	0.1003797***	0.1397587***	0.2298565***
Anova	Adj. R ²	0.1894	0.1757	0.2362
	F-test	87.00***	79.47***	114.83***
		(0.0000)	(0.0000)	(0.0000)
Panel	Law	0.1008111***	0.1403727***	0.2308269***
		(0.0000)	(0.0000)	(0.0000)
	Adj. R ²	0.1916	0.1780	0.2383
Hausman Test	F-Test	151.72***	125.29***	202.62***
		(0.0000)	(0.0000)	(0.0000)
	chi2	0.12	0.12	0.08
	Prob chi2	0.7241	0.7302	0.7755

*** Indicates a significance of < 1%.

** Indicates a significance of < 5%.

* Indicates a significance < 10%.

Effects of the law on board gender diversity

The results obtained from the method designed to test if the mandatory gender law enacted in 2007 has influenced the number of women on boards of directors of Spanish companies are shown in Table 12.

First, in order to check if the “Law of equality” has significantly increased the percentage of women on company boards, we have divided the total period (2003–2017) into two subperiods: from 2003 to 2007, and from 2008 to 2017. Taking into account that the law did not exist in the first subperiod and was enacted for the second subperiod, we have introduced a dummy variable, which takes the value 0 in the first period and 1 in the second. The *t*-test of difference of means, applied to each of the three gender proxies, supports that, in effect, at a 1% significance level, the law has had a positive impact, leading to a higher presence of women on company boards (PWomen is 10.04% higher after 2007, Blau 13.98 and Shannon 22.99).

Secondly, an analysis of variance (ANOVA) was performed and, as a result, we found that there exists a significant relationship between the validity of the gender law and the proportion of women in management positions, since the null hypothesis of equality of means between the two subsamples can be rejected and, therefore, the two means are different. Moreover, the *R*²-adjust is 18.94% for PWomen, 17.57% for Blau and 23.62% for Shannon.

Finally, and most important, the three gender proxies were estimated with fixed and random effects, and the validity of both models was subjected to the Hausman test. Since this showed a *p* value > 0.05 for PWomen, Blau and Shannon, the random effects model was applied to all three cases, and in all of them the effect of the compulsory law has resulted positive and significant, at a 1% significance level, to the increase of the proportion of women on company boards. The analyzed sample exhibited a *R*²-adjust equal to 19.16%, 17.80% and 23.83% for Pwomen, Blau and Shannon variables respectively. These findings are in line with Reguera-Alvarado et al. (2017).

Summarizing, the Spanish “Law of Equality” enacted in 2007 is, in effect, reducing the gender gap on the boards of top Spanish companies. The mandatory law is therefore a useful and efficient tool to promote gender equality, despite the criticisms which compulsory tokenism regulation has engendered.

Discussion and conclusions

Gender equality is a worldwide concern in all fields, including the economic. In fact, the ratio of women on boards is a central topic of corporate governance reforms. Gender diversity can involve a

competitive advantage and an important source of corporate value, due to the fact that it brings broader knowledge, abilities, perspectives and experiences. But it can also have some negative effects, such as a higher probability of conflicts in the decision-making process. Specifically, from a theoretical point of view, there are several arguments to support or oppose the existence of gender diversity on company boards. However, the empirical evidence is not conclusive in this respect, since research on this topic has not shown a clear link between gender diversity and company performance. The objective of this paper is to shed light on this topic, focusing on the analysis of important companies in Spain.

In the 21st century, there still remains an underestimation of women's skills as well as prejudices which question their competency and capability to hold management positions (Mateos del Cabo et al. 2012). This is why, with the aim of increasing the female presence on company boards, well-governance corporate guidelines and legislation on female quotas are appearing both nationally and internationally, as is the case in Europe. In order to explain the influence of gender diversity on financial performance, this research is based on four well-established theories: agency theory, resource dependence theory, stakeholder theory and the resource-based view.

The present analysis has a special value because the sample and the considered period present three prominent features. First, we contribute to the existing literature on board gender diversity and financial performance in Spanish firms. The findings obtained in a specific country should not be extrapolated to another, since the relationship between female board representation and financial performance is moderated by the particular context and how diversity is managed. Specifically, it is influenced by the level of shareholder protection, so that in countries with stronger shareholder protection, the correlation will be more positive (Post & Byron, 2015). Previous literature has been mainly focused on USA, and Spanish companies have been subjected to little research. Second, our study considers the principal Spanish listed firms, namely, those included in the IBEX35 index, which are the most representative of the Spanish economy. Third, our study considers a longer period: from 2003 to 2017, and considers the four years before and the ten years after the “Law of equality”. Consequently, our research allows us to check the effect which this law has had on the female representation on boards. Spain has traditionally had a low number of women in company management positions and, to tackle this problem, some public measures have been implemented: since 2003 listed companies have had to present a corporate governance report to the CNMV, and have to satisfy certain recommendations about gender equality; and, in 2007 the mandatory “Law of equality”, which requires a 40% quota, was enacted. However, as there are no sanctions in the case of non-compliance, companies in general have not paid attention to this requirement. The older firms and those belonging to more competitive sectors have a greater ratio of women in management positions (Pletzer et al., 2015). Spain is especially interesting to study the effect of law on gender diversity on boards, since previously it had one of the lowest rates of female representation and has promoted a law with a relatively high quota; in this way, it is possible to observe whether legal regulations can have positive general effects on companies. Moreover, our wide longitudinal study can capture how changes in gender diversity on boards influence performance over time.

Previous literature on Spanish firms is scarce and the findings are not conclusive. Gallego-Álvarez et al. (2010) find no relation between gender and profitability, but this work only considers the years from 2004 to 2006 and in this period the presence of women on boards was extremely low; in fact, these authors consider it necessary to carry out further studies in later years, when the female presence is greater. On the other hand, Campbell and Mínguez-Vera (2008) find a positive relationship between the percentage of women in management positions and their companies' financial performance, but the sample includes data from 1995 to 2000 and therefore it is not possible to test the effect of the gender law, which was enacted in 2007. Analogously,

Reguera-Alvarado et al. (2017) find the aforementioned positive correlation and they also find a positive influence of the gender law on gender diversity on boards; in this case, the sample refers to the period from 2005 to 2009, a short period after the enactment of the law and far from the present. Our paper contributes to the literature in terms of empirical and up-to-date evidence to support the positive influence of gender diversity on financial performance and, likewise, the positive influence of gender law on a higher presence of women in boards.

The main contributions of this paper are the following. First, the analyzed data show the existence of endogeneity between gender diversity on boards and financial performance, when this parameter is measured by Tobin's Q. Second, we find that gender diversity on boards of directors, measured by the percentage of women and by the Blau and Shannon indices, has a positive effect on their company's value; accordingly, an increasing quota of women in management positions does not go against shareholder's interests, and Spanish investors should therefore value every initiative enhancing the female presence in firms. These findings also support previous empirical studies which considered as positive the influence of an increasing number of women board members on financial performance (Adams & Ferreira, 2009; Campbell & Mínguez-Vera, 2008; Reguera-Alvarado et al., 2017; Ward & Forker, 2017). Third, the "Law of equality" is a mandatory law, but non-compliance does not incur any sanction and, as a consequence, the law is not observed by companies, and consequently the percentage of 40% is not being respected. Thus, the observance of the law is being seen more slowly than initially expected due to its non-sanctioning nature. Fourth, this evidence provides some support for quota-based policy initiatives. The current existing discrimination, not legal but real, can be reduced and removed by several active gender equality policies. The results of this study are a strong "business case" for promoting gender diversity on company boards.

In summary, we strongly believe that regulators should promote the female presence in top positions of companies, since this serves both financial and non-financial interests. Even if the higher percentage of women in management positions were not to influence financial performance, as long as the increasing number of women does not induce a detrimental effect on company performance, legislation should demand an increase in the presence of women for ethical reasons. It would be advantageous for a quota-based policy to be complemented with education policies to improve the training of women and with initiatives to balance work and family life.

For policymakers, the implementation of actions of positive discrimination in favor of women not only offers solutions to some problems of the past, but also implies environmental and social benefits through the improvement of a company's CSR performance. The failure to show Spanish companies the advantages of having more women as board members is usually argued as an important reason for explaining the lack of interest in achieving a more balanced representation on their boards of directors, and this study provides clear evidence which should motivate the business community to see the advantages of appointing women as board members. Our results provide a reason for a firmer quota-based policy in Spain, and this discussion is especially timely given that the newly-elected left-wing government has promised to revise Spanish legislation on board gender quotas to include a hard regulatory approach, or at least the threat of a hard quota.

We recognize that our study has several limitations, which can be addressed in future research. First, the cultural and institutional context may influence the relationship between gender diversity on boards and company performance (Grosvold et al., 2007). Therefore, in order to overcome the limitation of considering only Spanish companies, it is desirable to incorporate some cross-country analyses. Second, we have considered the most relevant Spanish companies, but they represent only a part of the total number of listed firms; consequently, it would be desirable to expand the sample and consider even unlisted companies. Third, there are some variables not included in the model due to their difficulty of measurement, such as age, education, experience, etc.,

which could influence or moderate the studied relation. It is also important to analyze those psychological factors derived from the perception that women are taken into account only to cover the legal quotas. It would be interesting to complement this analysis with other more specific studies, such as case studies or surveys in order to go in depth into the causes derived from non-public information. Summarizing, additional research is necessary to reveal the mechanisms by which gender diversity influences company performance.

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