

REVISTA DE CONTABILIDAD
SPANISH ACCOUNTING REVIEW

Revista de Contabilidad

ISSN: 1138-4891

rccsar@elsevier.com

Asociación Española de Profesores
Universitarios de Contabilidad
España

GALLEGO-ÁLVAREZ, ISABEL; GARCÍA-SÁNCHEZ, ISABEL MARÍA; RODRÍGUEZ-DOMINGUEZ, LUIS

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Revista de Contabilidad, vol. 13, núm. 1, enero-junio, 2010, pp. 53-88

Asociación Española de Profesores Universitarios de Contabilidad
Barcelona, España

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THE INFLUENCE OF GENDER DIVERSITY ON CORPORATE PERFORMANCE

LA INFLUENCIA DE LA DIVERSIDAD DE GÉNERO EN EL RENDIMIENTO EMPRESARIAL

ISABEL GALLEGO-ÁLVAREZ, Universidad de Salamanca

ISABEL MARÍA GARCÍA-SÁNCHEZ, Universidad de Salamanca

LUIS RODRÍGUEZ-DOMÍNGUEZ, Universidad de Salamanca

ABSTRACT

This work focuses on the effect of gender diversity on corporate performance. The current work, an extension of previous studies, focuses on the presence and effect of female stockholders, directors and top managers by analysing their impact on various accounting ratios, market value and technical efficiency. With a view to testing these hypotheses, we selected Spanish corporations that were listed on the Madrid Stock Exchange over the period 2004-2006 as an objective population. Corporate governance information on these companies is available from the CNMV database. Our findings show that companies with higher levels of gender diversity do not obviously outperform other companies with lower levels, in terms of several market and accounting measures. Therefore, gender diversity may not influence corporate performance.

KEY WORDS: Corporate governance, gender diversity, corporate performance, panel data
JEL: M13

RESUMEN

Este trabajo se centra en analizar el efecto de la diversidad de género en el rendimiento empresarial. El trabajo que se presenta, como extensión de estudios anteriores, se centra en analizar la influencia que tiene la presencia de mujeres accionistas, directivas y altos cargos en los Consejos de Administración de las empresas, así como en analizar el impacto que tiene dicha presencia en el rendimiento empresarial, tomando como variables representativas de dicho rendimiento medidas contables, de valor de mercado y de eficiencia técnica.

Con la finalidad de testar las hipótesis planteadas, se han seleccionado las empresas españolas que cotizaban en la Bolsa de Madrid durante el período 2004-2006, constituyendo el período objeto de estudio. La información sobre gobierno corporativo se ha obtenido de la base de datos disponible en la Comisión Nacional del Mercado de Valores. Los resultados obtenidos muestran que las empresas con mayores niveles de diversidad de género no superan a otras empresas con niveles más bajos, en términos de medidas contables y de mercado y en definitiva, la diversidad de género parece no influir en el rendimiento empresarial.

PALABRAS CLAVE: Gobierno corporativo, diversidad de género, rendimiento empresarial, datos de panel

Enviado/Submitted: 28/1/2009

Primera revisión/First revision: 28/4/2009

Aceptado/Accepted: 4/1/2010

Revista de Contabilidad-Spanish Accounting Review Vol. 13 - Nº 1
Pag. 53-88 ISSN: 1138-4891 Dep. Legal: MA-1436/97

1 | INTRODUCTION

An important issue, which generates widespread interest and a degree of controversy in the debate over corporate governance, has to do with diversity, defined as the range of ethnic and gender representation on boards of directors (Erhardt, Werbel and Shrader, 2003, p. 103). However, ethnic groups are not generalized across all countries; which is the reason why women play a very important role in this sense: for example, the Higgs Report (2003) stresses the importance of incorporating women onto boards of directors, especially when there is little or no female representation.

This legal requirement to increase the presence of female directors is in response to their low average numbers on the boards of European corporations, even though it has increased over recent years (Heidrick and Struggles, 2007). Nevertheless, the level of diversity varies from country to country (Carrasco Gallego and Laffarga Briones, 2006; Campbell and Minguez-Vera, 2008a; De Luis *et al.*, 2008).

Spanish politicians have been especially active in this context, by issuing a Unified Code of Good Governance and undertaking a legislative review with the aim of promoting gender diversity in labour environments. This normative context has reawakened interest in the relationship between gender diversity and corporate performance, because of the controversial nature of the topic, among other things. Although it may be socially and ethically correct to achieve a balanced presence of both genders on boards and in top management, it is widely noted that gender diversity does not necessarily lead to greater returns. Previous research has actually produced mixed results, given that the link between gender diversity and financial performance in a firm is both theoretically and empirically complex (Carter *et al.*, 2007, p. 4).

Based on the timeliness and the current interest of the topic, we have analysed the real impact of gender diversity on corporate performance, in line with some of the main topics in the field such as independence, etc. Thus, this study focuses on the impact of the percentage of women on boards and in top management, and the percentage of female stockholders with significant shares in stock ownership, by using several measures of corporate returns, efficiency and market value.

Therefore, the current work enlarges on previous evidence regarding the influence of gender diversity on performance by analysing diversity at different levels of decision-making within the firm, and by studying its impact on a broader set of accounting and market variables, in the context of a political commitment to increasing the presence of female managers in companies. Hence, this work encompasses a wider perspective in the study of female representation, compared to previous studies, which have usually focused on one category of female presence (director, manager or entrepreneur). It also extends the previous literature,

by analysing the impact on a wide range of corporate variables, such as accounting measures (margins and returns), market values and efficiency. The study is undertaken in a normative and regulatory context of strong political pressure to increase the participation of women in companies. Formerly, a country with one of the lowest percentage rates of female presence on boards, Spain has increased the pressure to facilitate their incorporation into top managerial positions. By combining the special features of the Spanish context and the variables under analysis, we can gain insight into the study of gender diversity. This research describes and analyses the situation before the normative changes undertaken in 2007. It is foreseeable that this situation may change in the years ahead, following their enactment into law and after the progressive incorporation of women into the most relevant positions in corporate governance, which should be analysed in the future.

However, we should emphasize that the study over the period 2004-2006 attempts to determine –without bias– whether a link of some sort exists between higher gender diversity and better corporate performance, so that increased gender diversity in the business field may be justified from a strictly economic perspective.

The absence of bias is derived from the fact that women who occupied senior positions throughout 2004-2006 were selected as a consequence of their education, training and professional experience. These features cannot be individually observed with data from 2007 and subsequent years, because, in addition to the effectiveness of gender diversity, it will reflect the presence of females in these positions in order to comply with legal requirements.

After performing a broad descriptive analysis and testing for differences of means, we applied panel data methodologies to estimate different models, with and without instrumental variables, in order to correct endogeneity problems. The findings obtained for our Spanish sample -96 firms observed during the period 2004 to 2006- suggest a non-significant or even a rather negative effect for gender diversity on corporate performance, in line with several previous studies. Therefore, our findings show no evidence for differences in corporate performance as a function of gender diversity.

Our results are especially significant in the current normative context in Spain, where political intervention is active to increase female presence in companies and an attempt is being made to reach labour parity between the two genders. However, as our findings suggest that this kind of diversity does not necessarily lead to greater corporate performance, a balanced presence of both genders in top decision-making bodies may perhaps be more easily explained from a sociological , rather than a strictly economic perspective.

This study is organized as follows: section 2 describes current normative changes which are intended to increase the presence of women within companies; section 3 analyzes and

summarizes the main theories and previous empirical evidence on the impact of diversity on corporate performance; section 4 describes our research methodology; and in section 5 we report on the empirical results, which are discussed in section 6, prior to setting out our conclusions in section 7.

2 TOWARDS INCREASED GENDER DIVERSITY IN SPAIN: RECENT NORMATIVE CHANGES

Significant political interventionism is a recent outcome that may be motivated by the advantages that ensue from greater gender diversity, or by the aim of removing the barriers to promotion to top corporate positions that females have to face.

On the one hand, in relation to non-compulsory recommendations and guidance, each country has developed its own corporate governance code. Although these codes are structured in different ways, they encompass the set of relations between company management, the board of directors, the stockholders and other stakeholders (Carrasco Gallego and Laffarga Briones, 2006). Considered of vital importance, gender diversity is an issue in corporate governance codes across the world (Rose, 2007, p. 404). Along these lines, Robinson and Dechant (1997) believe that corporations in which top management is formed by people from both genders will promote creativity and corporate innovation, because they will draw on different skills, experience and knowledge.

As in other countries, in Spain, the Unified Code of Good Governance, drawn up by the CNMV (*Comisión Nacional del Mercado de Valores* or Securities Markets Commission) and approved in 2006, explicitly mentions the need for adequate gender diversity on boards. According to this code, diversity not only represents a challenge from an ethical, political and corporate social responsibility perspective, but it is tied to efficiency which public companies should pursue in the medium and long term. The Spanish Code of Good Governance encourages firms with a low female presence to make an extra effort to search for female candidates whenever a board position has to be renewed, so that women may occupy top managerial positions and sit on boards of directors in listed corporations.

Two of the recommendations suggested by this code stand out in particular: a) that the selection procedure contains no implicit bias that might hinder the selection of female board members; and b) that companies make a conscious effort to search for and to include women who meet the requisite professional profiles.

Additionally, the White Paper on Corporate Social Responsibility, passed in 2006, also mentions diversity management among its recommendations. This White Paper considers that the female presence is a way of enriching organisational culture and is a source of competitive advantages. Subsequently, the Spanish Government passed the Effective

Gender Equality Act in 2007, with the aim of promoting equal opportunities and equal treatment, which legislated against gender discrimination in the labour market.

For instance, this law requires companies with more than 250 employees to implement equality plans in selection, professional promotion, training, rewards and compensation. As regards the representation of women on boards of directors, this law stipulates that the largest companies must attempt to include some women on their boards with a view to reaching a balanced presence of males and females within eight years. This regulation sets the criteria for the incorporation of board members in terms of talent and professional performance, to ensure that gender will not be an adverse selection factor.

In previous studies, although Campbell and Mínguez-Vera (2008b) obtained a positive effect on Tobin's Q, the diversity of the Spanish board of directors does not appear to influence corporate performance (Mateos, Escot and Gimeno, 2006; Jimeno and Redondo, 2007, 2008; Córdor and Esteban, 2008; Campbell and Mínguez-Vera, 2008a). Unlike these previous works, the scope of our research encompasses the influence of gender diversity in top management positions, the impact of female stockholders with significant stock ownership and the effect of female directors. Moreover, it analyses the impact on many variables linked to corporate performance, such as accounting measures, market value and efficiency, while controlling for corporate-governance features and correcting simultaneous causality.

In summary, this topic requires a broader approach in order to examine the influence of gender diversity in greater depth.

3 GENDER DIVERSITY, CORPORATE GOVERNANCE AND PERFORMANCE. THEORIES AND PREVIOUS EVIDENCE

Among its objectives, corporate governance literature analyses different mechanisms to improve the monitoring of managerial activities, so that stockholders' interests can be protected. For instance, more diverse boards as regards the origin and background of its members can reduce earnings management practices and the probabilities of committing frauds in financial statements (Beasley, 1996; Klein, 2002; Peasnell, Pope and Young, 2005; García Osma and Gill-de-Albornoz, 2007).

Currently, gender diversity is one of the most important governance issues facing managers, directors, and stockholders and it is considered part of good corporate governance. In this sense, Rose (2007) argues that corporations, like other organisations, should reflect the disparity of society as a whole, and diversity on boards and in top management is therefore a logical consequence. However, although gender diversity in

corporate governance is desirable from the perspective of social cohesion and is an increasingly visible trend in modern companies, from an economic perspective this diversity should not be established *per se*, but should lead to an increase in corporate value. Therefore, demand for gender diversity remains quite controversial, as it involves important advantages and several drawbacks. Table 1 summarizes the main advantages and drawbacks associated with gender diversity. Overall, diversity may lead to an improvement in monitoring management, due to greater boardroom independence and more complex and exhaustive decision-making processes. However, at the same time as gender diversity increases creativity, more complexity in decision-making is generated, which will imply potential conflicts and a lower degree of cohesion.

TABLE 1.- ADVANTAGES AND DRAWBACKS DERIVED FROM GENDER DIVERSITY

ADVANTAGES	DRAWBACKS
<p>Promotes a better understanding of the marketplace, thereby increasing its ability to penetrate markets (Carter, Simkins and Simpson, 2003; Campbell and Mínguez-Vera, 2008a)</p> <p>Enhances creativity and innovation inside the corporation</p> <p>Leads to more effective problem-solving since a more diverse board provides a wider variety of perspectives and, consequently, a higher number of alternatives to evaluate (Rose, 2007)</p> <p>May improve the quality of the directors and managers if they are selected from both genders without prejudice (Campbell and Mínguez-Vera, 2008a)</p> <p>May issue positive signals to markets –labour, products and capital markets– by providing a greater degree of legitimacy to corporations and improving their reputations (Carter et al., 2007; Rose, 2007).</p>	<p>Implies heterogeneous teams, which tend to communicate less frequently (Cox and Blacke, 1991; Watson, Kumar and Michaelsen, 1993; Earley and Mosakowski, 2000), are usually less cooperative and experience more conflicts (Tajfel and Turner, 1985; Williams and O'Reilly, 1998).</p> <p>May lead to the generation of discrepancies and less speed in the decision-making process, because the leadership styles are different among males and females (Litz and Folker, 2002, pp. 343-344; Fenwick and Neal, 2001)</p> <p>Can generate more opinions and critical questions inside heterogeneous boards that can be more time-consuming (Erhardt, Werbel and Shrader, 2003; Smith, Smith and Verner, 2006)</p>

This table depicts the main advantages and drawbacks related to gender diversity in companies, according to the previous referenced studies.

Three well-established theories that refer to gender diversity and its implications should be taken into account in any study of the association between performance and gender diversity at different levels of decision-making in modern-day corporations: agency theory, the resource dependence theory and the resource-based view of the firm. Agency theory suggests that increased boardroom independence and better monitoring of managers will ensue as a consequence of higher gender diversity; therefore, diversity may strengthen

existing control mechanisms over executives and managers. This theory is more directly linked to the presence of diversity on boards and stock ownership.

Meanwhile, the second and third theories are more easily applied to diversity in top management. The resource dependence theory argues that diversity can be an instrument for accessing resources that are critical to the firm's success and can enhance its overall problem-solving capacity, whereas the resource-based view focuses on the synergies arising from the interaction of males and females and on diversity as a source of competitive advantage.

3.1. Gender diversity on board of directors

Agency theory suggests that a more diverse board may entail better monitoring of managers, because board diversity increases board independence (Randøy, Thomsen and Oxelheim, 2006; Carter *et al.*, 2007). For instance, directors of a different gender, ethnicity or cultural background might ask questions that would not come from directors with more conventional backgrounds (Campbell and Mínguez-Vera, 2008a; Jurkus, Park and Woodard, 2007). Nonetheless, these minority members can be marginalized by majority members and their suggestions may not be considered in the decision-making process (Carter, Simkins and Simpson, 2003).

Moreover, board members of diverse gender or ethnic origin may better avoid practices of earnings smoothing and management, thus providing shareholders with more reliable figures for corporate performance. Moreover, diversity can lead to an increase in its effectiveness, which can eventually lead to good performance, as a consequence of a wider variety of perspectives and a more exhaustive decision-making process.

In this line, previous literature has demonstrated the positive effects of gender diversity on boards and on corporate performance. For instance, within US corporations, Adler (2001), Carter, Simkins and Simpson (2003) and Adams and Ferreira (2004) find that the proportion of women on boards of directors has a positive influence on corporate value - measured by Tobin's Q-, concluding that diversity is associated with greater financial performance. Carter *et al.* (2007) stress this positive relationship, by underlining that gender diversity has a positive effect on financial performance mainly through the Audit function of the Board.

Other studies (Erhardt, Werbel and Shrader, 2003; Jurkus, Park and Woodard, 2007; Krishnan and Park, 2005) have also analysed this impact on accounting measures, such as margins and returns, showing the positive influence of diversity as a consequence of a more effective monitoring function on boards. Along these lines, for example, Jurkus, Park

and Woodard (2007) have shown that the positive relationship is especially significant in industries with few women.

In contrast, several studies in the US reported that gender diversity had no impact as a mechanism of corporate governance in terms of market and financial performance, given that the drawbacks of gender diversity on boards can outweigh its advantages. The lack of influence of gender diversity on performance is shown by using both measures of market value (Richard, 2000; Kochan *et al.*, 2003; Ellis and Keys, 2003; Farrell and Hersch, 2005), and accounting measures of performance (e.g. Shrader, Blackburn and Iles, 1997).

The scope of the analysis has also been extended beyond the US environment, reflecting the same disparity found in the results. The positive impact of gender diversity on financial performance has been shown, for instance, in Denmark (Smith, Smith and Verner, 2006). However, several studies carried out in Denmark (Randøy, Thomsen and Oxelheim, 2006; Rose, 2007), Sweden (Du Rietz and Henrekson, 2000; Randøy, Thomsen and Oxelheim, 2006), Norway (Randøy, Thomsen and Oxelheim, 2006) and Spain (Jimeno and Redondo, 2007; Campbell and Mínguez-Vera, 2008a) have found that the composition of the board does not influence corporate performance. Moreover, certain negative effects of diversity on performance have been reported in Norway (Böhren and Ström, 2005) and in Denmark (Rose, 2004), and it was found that greater diversity can lead to a decrease in boards' effectiveness, which can give rise to a reduction in corporate value.

Taking the theoretical arguments into consideration and the previous empirical evidence, we propose to test the following hypothesis:

H₁: The presence of a higher percentage of women on boards of directors exhibits a positive and significant association with financial performance and corporate value.

3.2. Gender diversity in top management

The second theory -Resource Dependence Theory- views board diversity as one of the instruments that management may use to facilitate access to resources that are critical to the firm's success (Johnson, Daily and Ellstrand, 1996). Owing to the great complexity and dynamism in the current business context, companies require an increasingly diverse work force that will fit into the new business culture. Stiles (2001) specifically suggests that board diversity might boost access to critical resources, which would suggest that diversity, insofar as it relates to age, gender, and nationality, can have a positive impact on performance. Group diversity could influence management tasks positively, if it were to increase overall problem-solving capacity; at the same time, it is more likely to establish interactions and external links with the environment and, as a result, to win crucial resources for companies (Siciliano, 1996; Dalton *et al.*, 1999). For example, a more diverse

board could benefit from a greater understanding of its customers (Carter, Simkins and Simpson, 2003) or other key stakeholders, and from a wider knowledge of the industry or the choices of access to finance. Increased diversity will tap more information sources, but at the expense of less decisiveness (Randøy, Thomsen and Oxelheim, 2006). Therefore, the best performing work teams are highly likely to be linked to members that represent variation in terms of experience, background and gender. Furthermore, a scarce presence of females in top management could be regarded as discrimination that is both unethical and suboptimal, because an unprejudiced selection enables companies to attract and retain talent from a wider pool of human capital (Jimeno and Redondo, 2008).

Related to the earlier theory, the resource-based view stresses that corporate performance is strongly influenced by the physical, organisational and human resources that are available to management which comply with several features (Barney, 1991); they must be valuable, rare, have imperfect imitability, and no strategically equivalent substitutes. Gender diversity and the balance between both genders can become a source of competitive advantage (Watson, Kumar and Michaelson, 1993; Shrader, Blackburn and Iles, 1997; Farrell and Hersch, 2001), given that each gender contributes to management in a different and complementary way. Social psychology has pointed out that while many males may be predisposed towards leading in ways that emphasize competition, hierarchy, rational problem-solving, high control, low emotionality, and a bias for analysis, many females may conversely be predisposed to facilitating cooperation, team-based accomplishment, intuitive problem-solving, lower levels of control and high levels of emotionality (Litz and Folker, 2002, pp. 343-344; Fenwick and Neal, 2001). A more diverse team in management and on boards is better equipped to observe opportunities and threats on multiple fronts, and possesses a broader repertoire of skills and capabilities for superior problem solving and decision making (Krishnan and Park, 2005). Hence, unique and socially complex synergies may arise from the interaction of males and females that would otherwise not be possible with only single-gender activity, so that it can be assumed that firm performance may be positively related to more balanced gender representation in firm management (Litz and Folker, 2002).

While most studies focus on the diversity of boards of directors, which has a stronger link with the Agency Theory's arguments, a smaller number of works have analysed the impact of diversity on top management and its influence on obtaining better corporate performance. Whereas Kochan *et al.* (2003) do not find significant direct effects of diversity on organisational performance, other studies (Krishnan and Park, 2005; Litz and Folker, 2002; Shrader, Blackburn and Iles, 1997; Smith, Smith and Verner, 2006) have found a positive influence on financial return.

Consequently, we propose the following hypothesis in relation to the presence of women in top management:

H₂: The presence of a higher percentage of women in top management exhibits a positive and significant association with financial performance and corporate value.

3.3. Gender diversity in stockholders with significant ownership

According to Agency Theory, whereas ownership dispersion creates free-riding problems and makes manager monitoring difficult, large shareholders have incentives to monitor management and act as an additional control mechanism (Shleifer and Vishny, 1986; Jensen, 1993), which has a positive repercussion on corporate performance.

However, stockholders may also lead to a decrease in monitoring quality, as the expropriation hypothesis suggests. Shleifer and Vishny (1997) argue that in some countries the agency problem stems from the conflict between controlling owners and minority shareholders, instead of between managers and dispersed shareholders. In these cases, large shareholdings are costly, because majority owners can redistribute wealth from other minority shareholders, whose interests need not coincide.

The question over whether female and male stockholders behave in the way has led to the finding that women usually show more ethical awareness (Bernardi and Gupta, 2008). Welch, Welch and Hewerdine (2008) demonstrated that female entrepreneurs showed a higher degree of risk aversion than their male counterparts. Similarly, women prefer longevity over fast company growth (Bird and Brusch, 2002), considering self-fulfilment rather than profits as the main measure of their success (Weiler and Bernasek, 2001).

On the other hand, female stockholders with significant ownership obviously have strong incentives to achieve the best corporate performances, in order to increase their own personal wealth. Initially, Watkins and Watkins (1984), Fischer (1992) and Rosa, Carter and Hamilton (1996) suggested that women entrepreneurs underperform in relation to men as measured by conventional economic performance measures, mainly because of less training and corporate experience, and supported the controversial hypothesis of 'female underperformance'. However, the findings of Carter and Shaw (2006) and Driga and Prior (2008) suggest that the initial conditions of female-controlled businesses in size and finance explain this underperformance. Consequently, it may not result from differences in the managerial ability of women and men, but it could be the result of different levels of start-up resources.

Other studies (Kalleberg and Leicht, 1991; Johnson and Storey, 1993; Du Rietz and Henrekson, 2000) have not found any differences between genders. For instance, in their analysis of 300 firms in three industrial sectors in the US, Kalleberg and Leicht (1991) show that small companies managed by women were more orientated towards quality strategies and reached success levels similar to those managed by men. Du Rietz and Henrekson (2000) found that, on aggregate, female entrepreneurs tend to underperform in

relation to men; however, their subsequent and disaggregated analysis revealed that there are no consistent differences in the returns they generate.

Consequently, our final hypothesis relates to the presence of women in stock ownership:

H₃: The presence of female stockholders with significant ownership exhibits a significant association with financial performance and corporate value.

4 METHODOLOGY

4.1. Analysis technique and variables

Several dependence models based on linear panel data regressions were selected as the analytical technique to test the proposed hypotheses. More specifically, the models were estimated through fixed and random effects, by checking the validity of both models using the Hausman test.

The fixed effects model allows us to ignore the information related to those latent fixed effects, which are highly correlated with the variables included in the model, and provides us with consistent estimators.

The random effects model is more appropriate when there is no correlation between the fixed effects and the model variables, and it enables us to obtain more efficient coefficients; furthermore, it assumes that the variables are non-random and are not correlated with the explanatory variables.

The Hausman test checks the null hypothesis of absence of correlation between the individual effects and the independent variables; when not rejected, the higher degree of efficiency in the estimation leads to the use of the random effects model.

More specifically, the models are expressed as follows:

$$CP_{it} = \beta_0 + \beta_1 ALLWOM_{it} + \sum \beta_2 Y_{it} + \epsilon_{it} \quad [1]$$

$$CP_{it} = \beta_0 + \beta_1 FEMST_{it} + \beta_2 FEMDIR_{it} + \beta_3 FEMMNG_{it} + \beta_4 Y_{it} + \epsilon_{it} \quad [2]$$

where,

i indicates the company and t refers to the time period,

CP reflects the different measures of corporate performance,

ALLWOM, FEMST, FEMDIR and FEMMNG are the independent variables, representing gender diversity in companies, β is, in each case, the parameter to be estimated

Y reflects a vector of other explanatory variables, defined as control variables, ϵ is a random error term.

In addition, in order to correct simultaneous causality between independent variables and corporate performance, the models were run again with instrumental variables, using as instruments the lagged variables employed to represent gender diversity.

The variables selected for our analysis are shown in Table 2. We proposed seven alternative measures concerning the dependent variable. The first six variables relate to corporate performance indicators, which have been widely used in previous studies, such as Tobin's Q (e.g. Carter, Simkins and Simpson., 2003; Rose, 2007) and several accounting ratios -ROA, ROE, ROS, net ROA and gross margin- (e.g. Smith, Smith and Verner, 2006; Erhardt, Werbel and Shrader, 2003). The last dependent variable proposed -efficiency- may be considered a novel development.

TABLE 2.- DEFINITION AND TYPOLOGY OF THE VARIABLES

Variables	Definition	Typology
Q	Ratio between market value and assets for a company, defined according to Carter et al. (2007)'s specifications	Numeric
ROA	Return on assets, ratio of operating income to net assets	Numeric
ROE	Return on equity, ratio of operating income to stockholders' equity	Numeric
ROS	Return on sales, ratio between operating income and net sales	Numeric
ROAN	Net return on assets, ratio between net income and net assets	Numeric
MUB	Ratio of gross margin to net sales	Numeric
EFFICIENCY	Obtained from estimating the parametric frontier function, proposed by Battese and Coelli (1992), by using sales as the output, and number of employees and depreciation of assets during the current year as the inputs.	Numeric
ALLWOM	Sum of the variables FEMST, FEMDIR and FEMMNG	Numeric
FEMST	Proportion of women with significant stock ownership (higher than 5 per cent)	Numeric
FEMDIR	Proportion of women on the board of directors	Numeric
FEMMNG	Proportion of top managers which are females	Numeric
CRPSIZE	Corporate size measured by the logarithm of total assets	Numeric

Variables	Definition	Typology
BRDSIZE	Number of members in the board of directors	Numeric
CEODUALITY	Dummy variable, which takes the value 1 if the CEO also holds the position of Chairman of the Board and the value 0 otherwise	Dichotomic
MEETING	Number of annual meetings of the board of directors	Numeric
OUTSDIRECT	Proportion of outside directors on the board of directors	Numeric
IBEX35	Dummy variable which takes the value of either 1 if the company is listed on the IBEX-35 index, or 0 if otherwise	Dichotomic
LEV	Leverage, ratio of total debt to total assets	Numeric
DBTCT	Debt costs: interests from external debt	Numeric
SLSGRW	Sales growth: variation of sales from the prior period	Numeric

Corporate efficiency is considered, because it is one of the most precise techniques for measuring company performance, according to Hill and Snell (1989). It decreases the problems associated with Tobin's Q and financial ratios, such as extreme sensitivity to the use of different accounting methods or earnings smoothing (Barth, Gulbrandsen and Schone, 2005).

Efficiency was calculated through the estimation of a stochastic frontier function for panel data, proposed by Battese and Coelli (1992):

$$Y_{it} = x_{it}\beta + (V_{it} - U_{it}), \quad i = 1, \dots, 96 \quad t=1, \dots, 3$$

where

Y is the logarithm of sales for company i in period t as a production output,
 x_{it} is a vector of inputs used to obtain the output; in our estimation, the inputs encompass the number of employees and the depreciation of assets during the current year, as variables representing workforce utilisation and fixed investments,

β is the vector of unknown parameters,

V_{it} are random variables, which are assumed to be independent and equally distributed $[N(0, \sigma_v^2)]$ and independent of U_{it} ,

U_{it} is a random non-negative variable which is adopted as the measure of technical efficiency and is independent and equally distributed $[N(0, \sigma_u^2)]$.

As for the independent variables, we have selected three variables representing the female

presence in stock ownership, on the board of directors and in top management, and another variable – a substitute for the other variables- which involves the overall consideration of gender diversity in each company.

Finally, as control variables, we included four indicators of the three most relevant features of the main monitoring body, whose impact has been evidenced in previous studies, which are size (e.g. Yermack, 1996; Andrés, Azofra and López, 2005), activity (e.g. Vafeas, 1999), independence of the board of directors (e.g. Pearce and Zahra, 1992; Bozec and Dia, 2007), and a corporate size-related variable. Furthermore, we incorporated sales growth in the model, in order to identify growth trends in the company under analysis, as well as two variables linked to mechanisms for reducing the agency costs of external funds –leverage and debt cost– given that debt usually plays a disciplinary role and that a higher debt cost increases the level of control exerted by external financing such as that carried out by banks (Grinstein, 2006; Saona and Vallelado, 2007). The dummy IBEX35 reflects the most important Spanish companies.

When Tobin's Q is used as the dependent variable, the control variable ROA is additionally introduced because of its potential impact on the dependent variable (e.g. Carter, Simkins and Simpson, 2003).

In addition, all the models include annual and industry dummies to control for temporal and activity effects.

4.2. Sample description

As our objective population we selected those Spanish corporations which are listed on the Madrid Stock Exchange and whose information on corporate governance is available on the CNMV (Securities Markets Commission) database, in order to test the hypotheses. The Spanish context is especially interesting and worthy of analysis, given the low female presence on boards and in management positions at present and the increasing political pressure to encourage the participation of women in corporations.

We removed those companies which operate in financial and insurance industries from the population; consequently, our final sample was made up of 117 firms from different activity sectors.

This sample was selected for several reasons. Firstly, we are dealing with a set of the largest Spanish companies, the most significant ones trading in the Spanish Stock Market, which is particularly active nowadays. The largest companies are under more political pressure to comply with the minimum requirements of gender parity, so that the incorporation of a higher or lower number of women is likely to reflect a conscious choice. They are the main focus of the recent Spanish legislation, which aims to increase the role played by females in public

corporations, especially large-sized companies. Therefore, a study of this sample allows us to reach conclusions on a set of the most visible Spanish corporations, which have special incentives to implement a gender strategy on the inclusion and promotion of women to top corporate positions, which may be a useful model for other companies.

After the sample selection, all available information on corporate governance was gathered from the annual reports that the companies are obliged to deposit in the CNMV. The time period under analysis was 2004-2006. The information on corporate governance is available in a format called *Modelo de información sobre la asunción del Código de buen gobierno*. This information meant that our initial sample was reduced to 96 companies, which involved the analysis of 288 observations using financial data obtained from the AMADEUS Database.

5 RESULTS

5.1. Descriptive statistics, correlations and tests of differences between means

Table 3 (Panel A) shows the descriptive statistics of the sample. In line with other studies, these statistics reflect the low female presence in the largest Spanish companies. The total number of women in mainstream corporate positions reaches an average of 1 woman per company (a median of 1.00 woman), ranging from 0 to 4. Women usually hold positions firstly in top management (0 on average, with a maximum of 5 women) and then on the Board of Directors (0 on average, with a maximum of 4 women). The presence of female stockholders with significant participation is even more limited. The proportion of female directors on boards is 4.12 percent, ranging from no presence to a third of the board.

Furthermore, by analysing Q1, the Median and Q3, it can be observed that the distribution of female presence shows a significant degree of inequality, since the last 25 per cent of the companies analysed contains most of the women. Therefore, this sample, which groups the most significant Spanish companies in the stock market, reflects a rather unequal and anecdotal female presence in the Spanish business context.

This degree of female presence on boards, in line with many European countries like Belgium (3%), Italy (2%) and Portugal (a mere 0.7%), remains low. It is especially striking when compared with female representation in other countries, such as the USA and Scandinavia: female representation is 22% in Norway, 21% in Sweden and 14% in Finland. Meanwhile, other countries in the European Union, such as the UK, Germany and France, fall into an intermediate range of between 5 and 10% (Campbell and Mínguez-Vera, 2008).

It is worth emphasizing that Norway is one of the most advanced countries with regard to gender equality; in fact, since 2006 the representation of each gender on boards of

directors must reach at least 40% in this country. In Finland, the age and proportionality of both genders must be taken into consideration in the composition of the board, and in Sweden, legislation ensures gender equality in the composition of the board (Carrasco Gallego and Laffarga Briones, 2006).

The percentage of women in top management is quite reduced in relation to the 7.3 per cent found by De Luis *et al.* (2008), based on 9,875 managerial positions in the largest 2,000 Spanish companies.

Concerning the remaining variables, there is wide dispersion in the size of the companies under study (from 15,929,000 to 23,060,000,000 Euros in total assets); they are mature companies with stability in sales growth. Tobin's Qs do not reach high values, whereas profitability figures are –on average– 16.97 per cent and 6.7 per cent for Return on Equity (ROE) and Return on Assets (ROA), respectively (medians: 11.47 per cent and 4.87 per cent). The margins show an average of 38.34 per cent.

Regarding the variables related to corporate governance, boards are composed of 11 members, ranging from 3 to 21 members, who meet 8-9 times a year. In 59 per cent of the boards, the CEO also holds the position of chair (CEO duality). And, finally, there is a majority of non-executive directors (75.12 per cent, on average, which includes institutional directors; i.e. not all of those 75% are independent directors).

Panel B of Table 3 reflects the female presence by different activity sectors. The highest global female presence is shown in the services and real estate sectors, in which their average presence reaches figures of 2 and 1 women per company, respectively. The interval of presence reaches a maximum of five women. In those sectors, the highest female presence is found on boards, where it reaches a fourth or a third of their members. Technology and telecommunication activities also report a high degree of female presence in our sample, both in the total number and in the number of female managers. The lowest presence is in the petroleum and energy sector, in which the proportion of female directors is just 1 per cent. Moreover, the basic materials sector contains the most visible overall fluctuation in women (from 0 to 8), in female directors (0-4), in the proportion of female directors (0.00-0.33), in female managers (0-5) and in female stockholders (0-4).

Table 4 shows the bivariate correlations among the variables used in the analysis. Firstly, the variables reflecting female presence strongly correlate between each other; for instance, the correlations reach a figure of 0.733 between the female presence on boards and the total number of women in mainstream corporate positions, 0.687 between female stockholders and the total number of women, 0.613 between female managers and the total number of women, and 0.603 between female stockholders and female directors. So the

TABLE 3.- DESCRIPTIVE STATISTICS

Panel A. Descriptive statistics, whole sample

Variable	Mean	Median Deviation	Standard	Q1	Q3	Minimum	Maximum
ROA	0.067	0.049	0.084	0.019	0.086	-0.100	0.421
ROAN	0.415	0.127	1.119	0.040	0.323	-3.193	11.105
ROE	0.170	0.115	0.282	0.029	0.225	-0.687	2.032
ROS	0.244	0.164	2.143	0.048	0.500	-3.409	27.064
Efficiency	0.385	0.435	0.384	0.179	0.684	-0.961	0.993
Tobin's Q	1.540	0.300	3.320	0.130	4.320	0.160	27.000
Gross Margin	0.383	0.537	1.746	0.384	0.761	-22.111	1.357
Sales Growth	0.001	3.0e-08	0.010	1.0e-06	2.3e-05	0.000	0.165
Leverage	0.538	0.545	0.221	0.396	0.705	0.068	1.529
Debt cost	0.119	0.034	0.738	0.024	0.056	0.004	1.103
IBEX35	0.310	0.000	0.462	0.000	1.000	0.000	1.000
Corporate Size	2047204.390	534868	4061363.890	130747	2135401	15929	23060000
Overall Women	1.150	1.000	1.452	0.000	2.000	0.000	8.000
Female directors	0.400	0.000	0.702	0.000	1.000	0.000	4.000
Female top managers	0.470	0.000	0.803	0.000	1.000	0.000	5.000
Female signif. Stockholders	0.280	0.000	0.586	0.000	0.000	0.000	4.000
Members	11.220	11.000	4.002	8.000	14.000	3.000	21.000
Duality	0.590	1.000	0.493	0.000	1.000	0.000	1.000
Meetings	8.990	8.000	3.554	6.000	12.000	0.000	26.000
% outside directors	0.751	0.765	0.163	0.667	0.875	0.000	1.000
% Female directors	0.041	0.000	0.071	0	0.083	0	0.330

Table 3 shows summary statistics for the whole sample. ROA: Return on assets; ROAN: Net return on assets; ROE: Return on equity; ROS: Return on Sales; EFFICIENCY: obtained from estimating the parametric frontier function, proposed by Battese and Coelli (1992), by using sales as the output, and number of employees and depreciation of assets during the current year as the inputs; TOBIN'S Q: Ratio between market value and assets for a company; MUB: Ratio of gross margin to net sales; SALES GROWTH: variation of sales from the prior period; CORPORATE SIZE: logarithm of total assets; OVERALL WOMEN: Sum of the females in relevant managing positions; FEMALE DIRECTORS: Number of women on the board of directors; FEMALE TOP MANAGERS: Number of females in top management positions; FEMALE SIGNF STOCKHOLDERS: Number of females who are significant stockholders (higher than 5 per cent); MEMBERS: number of members on the board of directors; DUALITY: Binary variable which takes the value 1 if the CEO also holds the position of Chairman of the Board and 0 otherwise; MEETINGS: Number of annual meetings of the board of directors; % OUTSIDE DIRECTORS: Proportion of outside directors on the board of directors; % FEMALE DIRECTORS: Proportion of women on the board of directors

Monetary figures in thousands of euros

TABLE 3.- DESCRIPTIVE STATISTICS

Panel B. Female presence, by activity sectors: Mean (Interval)

SECTOR	Overall women	Female directors	% Female directors on Boards	Female top managers	Female significant stockholders	Numbers of years observations
Petroleum and Energy	0.480 (0-2)	0.140 (0-1)	0.001 (0.00-0.09)	0.340 (0-1)	0	36 (constant)
Basic Materials	1.330 (0-8)	0.450 (0-4)	0.041 (0.00-0.33)	0.490 (0-5)	0.390 (0-4)	114
Industry	0.810 (0-2)	0.370 (0-1)	0.052 (0.00-0.17)	0.190 (0-2)	0.260 (0-1)	33
Services	1.840 (0-5)	0.680 (0-3)	0.069 (0.00-0.33)	0.580 (0-3)	0.580 (0-2)	24
Real States	1.330 (0-4)	0.530 (0-2)	0.058 (0.00-0.25)	0.400 (0-3)	0.400 (0-1)	27
Technology and Telecommunicat.	1.070 (0-3)	0.300 (0-1)	0.038 (0.00-0.25)	0.780 (0-3)	0 (constant)	54

This table describes, firstly, the average number of females in companies from different activity sectors. In order to rank them, the decimals are maintained. In brackets, the maximum and minimum number of females in each sector are displayed.

presence of women directors is more likely in firms that have more women entrepreneurs. On the contrary, there is no significant correlation between female stockholders and female managers (-0.010). Therefore, those companies that have females in any position of corporate governance are very likely to have women in other relevant positions.

The highest correlations between the dependent and the independent variables are observed for FEMMNG with IBEX35 (0.277), for FEMST and ROAN (-0.179) and for ALLWOM and EFFICIENC (0.178).

Finally, there appears to be a strong relationship between membership in the IBEX-35 index and BRDSIZE (0.540), and CRPSIZE (0.454). In addition, other large correlations are given between DBTCT and MEETINGS (0.493) and SLSGRW and ROS (0.426).

Table 5 displays the results obtained after performing some tests of differences between means in corporate performance and corporate governance. Thus, we broke up the sample into two subsamples, on the basis of whether there is female presence or female absence in corporations, the reference variable being 'overall women'. If the company did not report a positive figure in 'overall women' it was assigned to the subsample 'Absence', and conversely it was assigned to 'Presence' if it reported a positive figure¹. After allocating the companies to their respective subsamples, we applied some non-parametric tests (Mann-Whitney's U and Kolmogorov-Smirnov's Z), the results of which are presented in Table 5.

The tests showed that organizations with a female presence in their mainstream corporate positions tended to report the lowest figures for corporate performance, such as ROA (5.95 opposed to 7.30 per cent), ROE (12.28 opposed to 18.29 per cent) or Tobin's Q (0.50 as opposed to 0.55); on the contrary, sales growth and margins are larger in the subsample containing companies with a female presence. However, Mann-Whitney tests do not detect significant differences, whereas Kolmogorov-Smirnov's Z is marginally significant for ROA, sales growth and margin. Consequently, considered overall, from a univariate perspective, differences in corporate performance as a function of female presence / absence cannot be stated.

Furthermore, there do not seem to be differences in corporate governance variables between companies with female absence / presence; their boards present a similar number of directors and a similar proportion of non-executive members and are just as frequently convened.

(1) The results remain unchanged when the median of the variable 'overall women' is used, instead of the split described (not reported).

TABLE 4.- PEARSON'S CORRELATION MATRIX

	ROA	TOBIN'S Q	ROS	ROAN	GRMARG	EFFICIENC	ALLWOM	FEM	DIR	MNG	ST	BOARD	MEETINGS	DUALITY	OUTSDIREC	CRPSIZE	IBEX35	LEV	DBTCT	SLSGRW
ROA	1																			
Tobin's Q	-.129(*)	1																		
ROE	.812(**)	-0.099	1																	
ROS	0.062	-0.055	0.005	1																
ROAN	.242(**)	-0.017	.128(*)	.227(**)	1															
GRMARG	0.036	0.046	0.025	-.423(**)	0.022	1														
EFFICIENC	0.110	-0.085	.154(*)	0.013	-0.061	-0.054	1													
ALLWOM	0.002	0.092	-0.008	0.074	-0.002	0.086	.178(**)	1												
FEMDIR	-0.020	0.061	-0.025	0.018	0.037	0.063	.143(*)	.733(**)	1											
FEMMNG	0.022	0.038	0.038	0.080	0.084	0.047	.130(*)	.613(**)	0.015	1										
FEMST	-0.006	0.101	-0.049	0.042	-.179(**)	0.061	0.082	.687(**)	.603(**)	-0.010	1									
BRDSIZE	0.011	0.065	0.064	0.037	.171(**)	-.151(*)	.350(**)	-0.060	0.013	-0.046	-0.087	1								
MEETINGS	-0.105	0.116	-0.056	0.099	.154(*)	0.072	0.089	-0.052	-.142(*)	0.083	-0.087	.176(**)	1							
DUALITY	-.132(*)	-0.029	-0.112	0.004	0.062	-0.110	0.048	0.067	-0.016	.190(**)	-0.103	-0.004	-0.043	1						
OUTSDIREC	0.053	0.062	0.116	0.041	0.042	-0.026	0.068	-0.108	-0.006	-.140(*)	-0.050	.308(**)	.142(*)	-.174(**)	1					
CRPSIZE	-0.066	0.076	-0.029	-0.010	.211(**)	-0.056	.312(**)	-0.091	-0.084	-0.007	-0.114	.424(**)	.259(**)	0.072	0.064					
IBEX35	0.092	0.102	.137(*)	0.052	.250(**)	-0.122	.381(**)	0.112	-0.051	.277(**)	-0.081	.540(**)	.237(**)	0.023	.172(**)	.454(**)	1			
LEV	-.168(**)	0.096	.177(**)	-0.067	-0.102	-0.042	.230(*)	-0.053	-0.063	0.014	-0.044	.221(**)	.226(**)	0.041	-0.05	.151(*)	.168(**)	1		
DBTCT	-0.035	-0.029	0.051	-0.016	0.012	0.026	0.110	-0.058	-0.057	-0.021	-0.045	-0.059	.493(**)	0.046	0.072	-0.038	-0.064	.267(**)	1	
SLSGRW	.183(**)	.178(**)	-0.011	.428(**)	.231(**)	-0.021	0.090	-0.022	-0.046	0.018	-0.029	-0.095	0.102	-0.077	0.063	-0.034	-0.031	-0.099	-0.011	1.000

Variables as defined in Table 2
(**) significant at 0.05 per cent
(*) significant at 0.10 per cent

TABLE 5.- TESTS OF DIFFERENCES BETWEEN MEANS

Subsamples' means and non-parametric tests

	Subsample	Mean	Mann-Whitney's U	KS's Z
Corporate Size	Absence Presence	3153654.370 1734643.810	9239	0.943
ROA	Absence Presence	7.303 5.954	9531	1.391**
ROAN	Absence Presence	0.383 0.418	8688	0.801
Sales Growth	Absence Presence	6.39e-04 0.001	8466	1.540**
ROE	Absence Presence	18.297 12.287	8552	1.194
Tobin's Q	Absence Presence	0.560 0.509	7642	0.848
Gross Margin	Absence Presence	0.212 0.563	5969	1.232*
Efficiency	Absence Presence	0.315 0.445	6683	1.554**
ROS	Absence Presence	0.178 0.232	7745	1.080
Board members	Absence Presence	11.160 10.600	7997.500	0.603
Duality	Absence Presence	0.560 0.620	7901.500	0.507
Meetings	Absence Presence	9.510 8.460	7.423	1.188
% outside directors	Absence Presence	0.748 0.754	7989.500	0.922

The sample is broken up into two subsamples: Absence (there is female absence in the company analysed, i.e. overall women = 0) and Presence (there is female presence in the company analysed, i.e. overall women > 0).

Variables as defined in tables 2 and 3.

The third column reflects the mean of the variable for both subsamples.

The fourth and fifth columns contain the non-parametric Mann-Whitney's U and Kolmogorov-Smirnov's Z tests of differences in means. Significant tests are in bold.

(**) significant at 0.05 per cent

(*) significant at 0.10 per cent

5.2. Coefficients obtained for fixed and random effects models

Table 6 displays the estimations for the fixed effects and random effects model, as well as the Hausman test for the significance of random effects. This test does not allow us to reject the hypothesis of absence of correlation between individual effects and independent variables. Consequently, the estimation with the random effects model is the most efficient one for the variables Tobin's Q, ROA, ROE, Gross Margin and Efficiency. For the model which explains the dependent variables ROS and Net-ROA, the fixed effects models are more suitable than the random effects models. No multicollinearity problems were registered after measuring the variance inflation factors.

As regards the significance of the variables, the variable ALLWOM, reflecting the total proportion of women in the main corporate bodies involved in the decision-making process, shows a significant and negative effect on the dependent variables ROA, ROS and ROE at a confidence level ranging from 90% ($0.05 < p\text{-value} < 0.1$) to 99% ($p\text{-value} < 0.01$). There is no significant impact on the remaining variables.

The variable FEMDIR, which indicates the proportion of female directors on the board, shows a positive and significant impact on Tobin's Q (confidence level of 95%) and ROAN, at a confidence level of 99%. No significant effects on the other variables were detected. Regarding the variable FEMMNG –percentage of female managers in top management- the results evince little or no significant impact of gender diversity on the variables of corporate performance.

The variable FEMST, which represents the proportion of female stockholders with significant stock ownership, shows a negative association with ROAN (statistically significant at a confidence level of 99%). There are no significant effects on the remaining variables related to corporate performance.

Models estimated with instrumental variables were used in order to correct potential problems of simultaneous causality between dependent and independent variables. Table 7 summarizes the coefficients of the variables that reflect gender diversity.

The results confirm above-mentioned inverse relationship for the independent variable ALLWOM and the dependent variables ROA, ROE and ROS. When the variable ALLWOM was disaggregated into the variables defining the female presence in top management, boards and stock ownership, no significant relationship was detected between those variables and corporate performance, thereby suggesting that gender diversity does not significantly influence many of the corporate performance-related variables. Considered overall, the absence of any significant impact is stressed, given that most of the variables analysed do not appear to reflect a significant effect of female presence.

TABLE 6.- PANEL A. COEFFICIENTS FOR INDEPENDENT VARIABLES
(FIXED EFFECTS MODEL AND RANDOM EFFECTS MODEL), OVERALL WOMEN

Variable	ROA		Tobin Q		ROE		ROS		ROA-Net		Gross Margin		Efficiency	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
ROA														
ALLWOM	-0.622*	0.341	-0.000	2.9e-04	-1.501*	0.828	-0.140***	0.053	0.111	0.083	0.121	0.090	0.011	0.015
BRDSIZE	-0.091	0.198	-8.3e-05	0.001	0.054	0.529	-0.032	0.039	-0.135**	0.063	-0.005	0.045	0.005	0.008
MEETINGS	-0.321**	0.170	0.0013**	6.5e-04	-0.721*	0.425	-0.004	0.028	0.092**	0.045	0.034	0.041	0.003	0.005
DUALITY	-260.281**	1.154	-2.9e-04	0.004	-4.493	29.149	-0.166	0.197	-0.159	0.3117	-0.302	0.268	-0.045	0.046
OUTSDIRECT	-3.408	3.710	0.009	0.016	-368.611	1.021	1.252	0.758	-2.123*	1.199	0.685	0.856	-0.069	0.144
CRPSIZE	-3.60e-08	1.49e-07	0.006*	0.003	-2.72e-07	4.67e-07	-2.34e-08	9.68e-08	-1.10e-07	1.53e-07	-1.18e-08	5.24e-08	0.101***	0.019
IBEX35	5.847***	2.262	0.001	0.010	15.695**	7.139	0.000	1E-09	0.00000	1E-09	-0.854**	0.449		
LEV	-1.277***	3.266	0.041***	0.013	-6.611	9.326	-1.823***	0.706	-0.665	1.117	-0.184	0.711		
DBTCT	.0024***	0.001	-9.35e-07	2.93e-06	0.014***	0.006	1.3e-04	1.3e-04	-1.1e-04	1.9e-04	-5.9e-05	1.8e-04		
SLSGRW	-3.681	1.116	1.928***	0.684	-1.808	2.591	-9.939	1.570	3.080	2.485	-1.237***	1.780		
Intercept	1.744***	4.243	-0.055	0.035	1.942	1.291	2.259***	0.771	2.455**	1.220	0.906	0.869	-0.976***	0.211
	R² = 0.155		R² = 0.159		R² = 0.118		R² = 0.120		R² = 0.083		R² = 0.312		R² = 0.480	
	Wald Chi-squ = 38.090***		Wald Chi-squ = 32.770***		Wald Chi-squ = 23.320		F = 1.940**		F = 1.280		Wald Chi-squ = 58.810***		Wald Chi-squ = 75.920***	
	Hausman test -25.220		Hausman test 6.370		Hausman test 10.520		Hausman test 29.520***		Hausman test 15.140**		Hausman test 6.500		Hausman test 10.720	

Variables as defined in Table 2
 (**) significant at 0.05 per cent
 (*) significant at 0.10 per cent

TABLE 6.- PANEL B. COEFFICIENTS FOR INDEPENDENT VARIABLES (FIXED EFFECTS MODEL AND RANDOM EFFECTS MODEL) WOMEN IN TOP MANAGEMENT, ON BOARDS OF DIRECTORS AND SIGNIFICANT STOCKHOLDERS

Variable	ROA		Tobin Q		ROE		ROS		ROA-Net		Gross Margin		Efficiency	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
ROA														
FEMDIR	-0.267	0.850	-3.8e-04	2.9e-04	-0.328	203.012	0.080	0.115	0.501***	0.146	-0.091	0.307	-0.042	0.043
FEMMNG	-0.860	0.680	0.003	0.003	-2.808	1.705	-0.101	0.089	0.060	0.099	-0.026	0.270	0.006	0.026
FEMST	-0.899	1.105	-0.007	0.004	-2.023	2.663	-0.234	0.148	-0.640***	0.187	0.187	0.375	0.089	0.054
BRDSIZE	-0.107	0.202	-9.9e-05	8.2e-04	0.008	0.536	-0.016	0.026	-0.014	0.026	0.062	0.083	0.005	0.008
MEETINGS	-0.317*	0.171	1.3e-03**	6.5e-04	-0.700	0.427	-0.007	0.022	0.054**	0.025	-0.028	0.070	0.002	0.005
DUALITY	-2.606**	1.168	-0.001	0.004	-4.462	2.934	0.076	0.151	0.043	0.169	0.099	0.409	-0.038	0.046
OUTSDIRECT	-347.608	3.772	0.010	0.016	-3.553	1.039	-0.506	0.474	-0.904*	0.482	0.165	1.643	-0.054	0.143
CRPSIZE	-3.86e-08	1.51e-07	0.005	0.003	-2.99e-07	4.73e-07	-5.94e-09	1.77e-08	3.73e-08***	1.56e-08	4.47e-07**	2.22e-07	0.106***	0.019
IBEX35	6.057***	2.316	0.002	0.010	1.665**	7.253	0.018	0.273	0.633***	0.246	0.000	1E-09		
LEV	-1.275***	3.288	0.039***	0.013	-6.351	9.364	-0.185	0.409	-1.129***	0.402	-0.214	1.566		
DBTCT	0.002***	0.001	-8.10e-07	2.5e-06	0.014***	0.006	1.57e-06	9.9e-05	9.80e-06	1.2e-04	6.1e-05	2.9e-04		
SLSGRW	-3.779	1.119	2.006***	0.677	-1.868	2.595	-9.485	1.544	6.740***	2.189	-1.747***	2.317		
Intercept	175.363***	4.282	-0.045	0.036	3.253***	1.269	0.898***	0.510	0.105	0.522	-0.674	1.733	-1.035***	0.214
R² = 0.156 R² = 0.167 R² = 0.125 R² = 0.012 R² = 0.248 R² = 0.367 R² = 0.269 Wald Chi-squ. = 38.130*** Wald Chi-squ. = 37.710** Wald Chi-squ. = 24.210 Wald Chi-squ. = 1.150 Wald Chi-squ. = 57.130*** F = 5.360*** Wald Chi-squ. = 80.040*** Hausman test 1.070 Hausman test 6.960 Hausman test 8.880 Hausman test 1.000 Hausman test 11.050 Hausman test 30.110*** Hausman test 13.020														

These tables display the impact of overall women (Panel A) and different levels of gender diversity (female directors, managers and stockholders; Panel B) on ROA, Tobin's Q, ROE, ROS, ROA-Net, Gross Margin and Efficiency.

Variables as defined in Tables 2 and 3

Models with random or fixed effects are shown, depending on the value obtained for Hausman's test

Industry and temporal dummies are included in all models. Industry dummies are according to Madrid Stock Market criteria

In bold, significant coefficients.

N = 288

* p-value < 0.1 ** p-value < 0.05 *** p-value < 0.01

TABLE 6.- PANEL A. COEFFICIENTS FOR INDEPENDENT VARIABLES
(LINEAR MODELS ESTIMATED WITH INSTRUMENTAL VARIABLES)

Variable	ROA		Tobin Q		ROE		ROS		ROA-Net		Gross Margin		Efficiency	
	Random effects Coef.	Std. Err.	Random effects Coef.	Std. Err.	Random effects Coef.	Std. Err.	Fixed effects Coef.	Std. Err.	Fixed effects Coef.	Std. Err.	Random effects Coef.	Std. Err.	Random effects Coef.	Std. Err.
ROA														
ALLWOM	-2.737*	1.545	-3.8e-04	2.6e-04	-4.018**	2.137	-0.222**	0.089	-0.116	0.096	0.401	0.281	0.022	0.027
BRDSIZE	-0.240	0.262	-0.001	0.001	-1.155*	0.692	-0.148***	0.056	-0.160***	0.059	-0.017	0.058	2.6e-04	0.008
MEETINGS	-0.388*	0.234	-4.9e-04	6.1e-04	-0.409	0.561	1.9e-04	0.038	-0.004	0.040	0.076	0.053	0.002	0.006
DUALITY	-2.035	1.561	8.5e-04	0.004	-4.370	3.803	-0.386	0.269	0.249	0.288	-0.567	0.351	-0.044	0.041
OUTSDIRECT	2.761	4.901	0.009	0.016	7.290	132.573	2.459***	0.996	-0.671	1.063	0.998	1.095	0.078	0.127
CRPSIZE	-9.09e-08	1.70e-07	0.006**	0.003	-4.00e-07	4.95e-07	-5.53e-08	1.13e-07	1.30e-07	1.20e-07	-5.43e-08	6.38e-08	0.082***	0.017
IBEX35	654.489***	2.755	0.007	0.009	1.683**	7.739	0.000	1E-09	0.000	1E-09	-1.114*	0.593		
LEV	-116.246***	40.777	0.035**	0.013	6.439	1.107	-1.056	0.908	-0.453	0.969	-0.2897	0.856		
DBTCT	0.017***	0.004	9.13e-06	1.4e-05	0.049***	0.010	0.004***	6.9e-04	0.002***	0.001	-1.8e-04	0.001		
SLSGRW	2.209*	130.424	2.083***	0.530	2.216	2.858	-2.656	1.706	1.046***	1.821	-1295.83***	2.280		
Intercept	200.045***	5.871	-0.032	0.034	2.783*	1.624	2.931***	1.015	2.270**	1.084	1.213	1.189	-0.704***	0.181
	R² = 0.325		R² = 0.156		R² = 0.322		R² = 0.505		R² = 0.423		R² = 0.275		R² = 0.477	
	Wald Chi-squ. = 44.530***		Wald Chi-squ. = 32.000***		Wald Chi-squ. = 39.600***		Wald Chi-squ. = 888.400***		Wald Chi-squ. = 172.530***		Wald Chi-squ. = 45.740***		Wald Chi-squ. = 63.600***	

TABLE 7.- PANEL B. COEFFICIENTS FOR INDEPENDENT VARIABLES
(LINEAR MODELS ESTIMATED WITH INSTRUMENTAL VARIABLES)
WOMEN IN TOP MANAGEMENT, ON BOARDS OF DIRECTORS AND SIGNIFICANT STOCKHOLDERS

Variable	ROA			Tobin Q			ROE			ROS			ROA-Net			Gross Margin			Efficiency								
	Random effects Coef.	Std. Err.		Random effects Coef.	Std. Err.		Random effects Coef.	Std. Err.		Fixed effects Coef.	Std. Err.		Fixed effects Coef.	Std. Err.		Random effects Coef.	Std. Err.		Random effects Coef.	Std. Err.							
ROA				0.001	0.002																						
FEMDIR	-2.345	482.873		0.008	0.020		-6.756	5.455		0.119	0.788		-2.310	2.278		-0.118	0.908		0.014	0.116							
FEMMNG	5.835	6.094682		0.089	0.140		-2.085	9.607		1.217	0.911		0.765	0.598		-0.523	457.333		-0.008	0.030							
FEMST	-.986	4.890369		-0.003	0.024		9.718	7.969		-0.718	0.799		1.982	2.264		0.363	0.994		0.130	0.139							
BRDSIZE	-.147	.3960173		0.001	0.004		1.792	1.595		-0.051	0.063		0.082	0.106		0.197	0.339		-0.003	0.008							
MEETINGS	-.404	.2822186		-1.1e-04	0.002		0.510	5.489		-0.028	0.044		-0.008	0.055		-0.017	0.201		0.004	0.006							
DUALITY	-3.695	2.358598		-0.015	0.025		3.123	1.716		-0.446	0.369		0.519	0.531		0.017	1.052		-0.029	0.044							
OUTSDIRECT	2.103	6.306983		0.036	0.058		655.795	3.035		-0.230	0.998		1.151	1.524		0.701	373.118		0.081	0.132							
CRPSIZE	6.85e-08	2.30e-07		0.010	0.013		-4.93e-06	2.2e-05		2.37e-08	3.55e-08		3.14e-08	3.44e-08		7.22e-07	4.61e-07		0.091***	0.019							
IBEX35	.736	5.511416		-0.069	0.124		1.305	5.335		-0.696	0.847		-0.658	0.919		0.000	1E-09										
LEV	-1.165***	4.806529		4.9e-04	0.064		238.396	1.177		-0.068	0.755		-1.138	0.795		-0.800	3.670										
DBTCT	.020***	.0052798		-6.3e-05	1.2e-04		-0.062	0.540		0.004***	0.001		3.2e-04	0.001		-0.002	0.006										
SLSGRW	254.258*	1.540695		2.967	1.938		-1.400	2.369		-142.016	2.445		9.506***	3.056		-1.846***	396.708										
Intercept	1.960***	7.122353		-0.179	0.255		-4.653	3.737		2.131**	111.974		-0.024	121.252		-227.567	43.173		-0.831***	0.220							
																					R² = 0.051	R² = 0.042	R² = 0.129	R² = 0.076	R² = 0.0519	R² = 0.392	R² = 0.467
																					Wald Chi-squ. = 32.960***	Wald Chi-squ. = 3.740***	Wald Chi-squ. = 0.730	Wald Chi-squ. = 29.410**	Wald Chi-squ. = 19.94	F = 41.310***	Wald Chi-squ. = 60.470***

These tables display the impact of overall women (Panel A) and different levels of gender diversity (female directors, managers and stockholders; Panel B) on ROA, Tobin's Q, ROE, ROS, ROA-Net, Gross Margin and Efficiency.

Variables as defined in Tables 2 and 3

Models are run with instrumental variables. Random or fixed effects are shown, depending on the value obtained for Hausman's test.

Industry and temporal dummies are included in all models. Industry dummies are according to Madrid Stock Market criteria

In bold, significant coefficients.

N = 288

* p-value <0.1 ** p-value <0.05

Concerning the remaining variables, in the models without instrumental variables, MEETINGS displays an inverse relationship with ROA and ROE and a direct relationship with ROAN; the relationships with the other variables are not statistically significant. DUALITY evinces an inverse relationship with ROA, as does OUTSDIRECT with ROAN. CRPSIZE is directly linked to corporate efficiency. The IBEX-35 shows mixed findings, with a direct relationship with ROA and ROE, an inverse relationship with GRMARG, and a non-significant relationship with Tobin's Q, ROS and ROAN. LEV has a negative association with ROA and ROS (ROAN in the model developed in Panel B), and a positive association with Tobin's Q. The remaining variables are not significant. DBTCT exhibits a positive association with ROA and ROE. SLSGRW has a negative association with GRMARG; additionally, it displays a positive association with Tobin's Q in both panels and with ROAN in the model developed in Panel B.

On the other hand, when analysing the coefficients for independent variables in those linear models estimated with instrumental variables, many coefficients change to non-significant, especially in the model with disaggregated variables (Panel B), thus revealing the importance of the effects that arise from simultaneous causality among the variables under analysis.

6 DISCUSSION OF RESULTS

Table 8 depicts the findings obtained for each variable, showing the impact of a female presence and its nature.

TABLE 8.- SUMMARY OF FINDINGS.
NATURE OF THE IMPACT OF FEMALE PRESENCE ON PERFORMANCE

IMPACT	OVERALL WOMEN	Women on Board of Directors ^a	Women in Top Management ^a	Women with significant stock ownership ^a
+		Net ROA Tobin's Q		
-	ROA ROE ROS			Net ROA
N/S	Tobin's Q Net ROA Gross Margin Efficiency	ROA ROE ROS Gross Margin Efficiency	ROA Tobin's Q ROE ROS Net ROA Gross Margin Efficiency	ROA Tobin's Q ROE ROS Gross Margin Efficiency

^a Non significant results when instrumental variables are used

This table summarizes the findings obtained about the influence of gender diversity on corporate performance and market value, by differentiating the field of gender diversity analysed: overall women, women on boards of directors, women in top management and women with significant stock ownership.

The first / second / third rows reflect on which variables of corporate performance there is a positive / negative / non-significant influence, by different scopes of gender diversity.

Considered overall, the results show a non-significant or a rather negative influence of female presence on corporate performance. There is a prevalence of non-significant results, given that most variables display a non-significant influence. In addition, the negative influence on certain variables could be considered as anecdotal and erratic, given their scarce number and the fact that it may be difficult to assume a non-significant influence on some variables and a negative effect on other variables when they are closely related.

More specifically, we have verified that the overall presence of a higher number of women in the main corporate decision-making bodies leads to a non-significant effect on most variables related to corporate performance. Moreover, it does not affect the technical efficiency of the production process. We also see a decrease in corporate returns, mainly return on assets, return on equity and return on sales. These findings would be consistent with Core, Holthausen and Larcker (1999), who demonstrated that companies with weaker governance structures (for instance, due to a higher diversity that reduces effectiveness) show greater agency problems and worse performance.

The presence of female directors on boards has a mainly non-significant effect on corporate performance. It shows a positive direction in net return on assets and Tobin's Q , but this disappears after controlling for simultaneous causality. The female presence does not seem to influence the remaining variables significantly. Consequently, it is not possible to uphold hypothesis 1. This finding is in accordance with previous research. Although Smith, Smith and Verner (2006) and Erhardt, Werbel and Shrader (2003) obtain a positive influence on corporate return, Shrader, Blackburn and Iles (1997), Randøy, Thomsen and Oxelheim (2006) and Jimeno and Redondo (2007) conclude that there is an absence of effect. This lack of effect is also found in Rose (2007) -for Denmark-, Böhren and Ström (2005) -for Norway- and Campbell and Mínguez-Vera (2008) -for Spain-, who use Tobin's Q as a proxy of corporate performance.

Concerning the female presence in top management, we too obtained a predominant non-significant relationship with corporate performance, market value and efficiency, leading us to reject hypothesis 2. These findings add to the lack of consensus shown in previous empirical evidence. For instance, while Krishnan and Park (2005) and Jurkus, Park and Woodard (2007) conclude a positive relationship between the female presence in top management and return on assets for the USA, Shrader, Blackburn and Iles (1997) contend that this relationship is not significant for many indicators of corporate performance. In addition, Smith, Smith and Verner (2006) only showed a positive influence on net return on assets of those women holding mainstream managerial positions in Danish corporations. The presence of female stockholders with significant stock ownership is not related to most of the variables corresponding to corporate returns. It is just inversely associated with net return on assets in the overall model (Table 6, Panel A); these effects disappear when the simultaneous causality is controlled for, such that neither is hypothesis 3 upheld.

In this sense, previous studies, such as those by Fischer, Reuber and Dyke (1993) -for Canada-, Cooper, Gimeno-Gascón and Woo (1994) and Fasci and Valdez (1998) -for the USA-, Rosa, Carter and Hamilton (1996) and Chell and Baines (1998) -for the UK-, Du Rietz and Henrekson (2000) -for Sweden- and Watson and Robinson (2003) -for Australia- evidenced a negative or a null association between the presence of female entrepreneurs and corporate growth and performance and, even, the survival of companies owned by them (Kalleberg and Leicht, 1991; Carter *et al.*, 1997; Boden and Nucci, 2000). Furthermore, Spanish corporations are distinguished by the strong presence of majority stockholders with significant influence on management (LaPorta, López-de-Silanes and Shleifer, 1999), which indirectly could imply that the participation of females in stock ownership may be a consequence -in some cases- of their family links, rather than a personal interest in being entrepreneurs.

As for the remaining variables, some relationships stand out, such as the positive effect of leverage on Tobin's Q and the inverse association with ROA and ROS, and the positive association of the debt cost with many variables of corporate performance. The direct relationship between leverage and Tobin's Q is consistent with McConnell and Servaes (1995), who find that leverage is negatively related to Tobin's Q for high-growth firms and positively related to Tobin's Q for low-growth firms, as shown by the companies analysed in the variable 'sales growth'. In addition, leverage plays a significant disciplinary role (Grinstein, 2006), leading managers to operate more in favour of stockholders' interests, providing a positive relationship with variables of corporate performance. Furthermore, a higher debt cost increases the discipline related to external financing, given greater control exercised by the banking sector and other external financing entities

7 CONCLUSIONS

The composition of boards of directors is attracting greater attention, as a consequence of its impact on board independence and on the monitoring of managers. Among the different issues analysed in the composition of boards of directors, gender diversity particularly stands out because it can become a competitive advantage and a source of corporate value. Labour complementarities between men and women and the new perspectives which diversity can provide in the decision-making processes can lead to a broader knowledge base, creativity and innovation. Therefore, a more diverse work team will be better enabled to prepare for more appropriate decisions and problem solving.

Nevertheless, diversity also implies a potential source of conflicts, as well as a slow decision-making process, which could be especially negative in competitive environments where the speed in making decisions may be crucial.

Empirical evidence is not sufficiently conclusive as regards the impact of gender diversity in corporate governance on financial performance and corporate value, an absence of direct effect over several return measures often being obtained.

In an extension of previous studies, the present work has analysed the effect of the presence of female stockholders, directors and top managers on corporate performance, measured by several accounting ratios, market value and technical efficiency. Its scope is wider, both with regard to the female presence under analysis and the range of variables on which the effect of female presence is studied, in comparison with other studies. In addition, the geographic context of the study –Spain– provides an interesting context, given that this country has evolved from having one of the lowest rates of female presence in corporations in Europe to increasing political pressure to strengthen enhance that presence. Consequently, the findings are especially significant in the current normative context, in which an attempt is being made to reach labour parity between both genders. Our empirical analysis –based on tests of differences between means and some linear panel data regressions– has shown a non-significant effect and sometimes a negative influence of overall female presence on boards, in top management positions and in stock ownership. Most of the effects of female presence lead to non-significant relationships with corporate performance, market value and efficiency. Therefore, there do not appear to be any differences in corporate performance from the perspective of gender diversity. This kind of diversity in mainstream corporate positions does not necessarily lead to greater corporate performance, so that companies with higher levels of gender diversity will not clearly obtain better performance as defined by several market and accounting measures. Therefore, gender diversity may not influence corporate performance. Consequently, the requirements of increasing gender diversity may not necessarily be derived from performance drivers –since there does not seem to be a direct influence– but these requirements should rely more on factors of a sociological nature.

This study, as well as the research methodology within which it is framed, show several drawbacks which should be underscored. Firstly, there could be simultaneous effects of other variables –age, culture, education, training, directors' and managers' previous background and experience, corporate social responsibility, other relevant aspects of diversity, etc. – which are not explicitly considered in models, given that they are particularly difficult to measure. However, they can influence the relationship between diversity and performance. We should also bear in mind that a female presence is one aspect of diversity, but there are other factors that can be also relevant.

Secondly, this methodology should be complemented by other type of analyses, such as case studies or surveys, which can provide researchers with basic and primary information on the evolution of gender diversity in companies and its influence on them. Moreover, although the sample under analysis is a relevant one that contains the largest Spanish

companies, which show a growing concern and interest in gender diversity, its size is in itself a limitation, given the small number of companies available. Thirdly, there is a scarce presence of females in the largest Spanish companies, thus leading to a low number of women in our sample. Given that Spanish boards show low rates of female presence (although this will foreseeably change in the future, as companies meet the requirements of the recent legislation), it would appear appropriate to carry out further studies in some years time, when boards will presumably be more diverse.

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