

THE INFLUENCE OF GENDER ON SPANISH BOARDS OF DIRECTORS: AN EMPIRICAL ANALYSIS

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ABSTRACT

Many studies have examined the impact of various characteristics of the board of directors on firm value. However, little attention has been paid to the impact of female board membership on firm value, with the exception of a number of U.S. studies. The aim of this paper is to investigate this issue in a specific context - the Spanish market. We find that the stock market reacts positively to the announcement of a female board appointment, using a non-parametric test, though the result is inconclusive when a parametric test is used. We also find an insignificant relationship between the presence and percentage of women on the board, and firm value, and we find that the opposite causal relationship is also insignificant.

Keywords: women, board of directors, firm value, endogeneity.

JEL classification: G30, G34, G38

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1. INTRODUCTION

The term corporate governance encompasses a series of mechanisms aimed at aligning the interests of owners and managers. These mechanisms can be classified as either internal or external to the firm. Internal control mechanisms, which include the ownership structure of the firm, the composition of the board of directors and executive compensation systems, are particularly important in those countries – such as Spain – where stock markets, and hence external control mechanisms, are less well developed than in Anglo-Saxon countries.

A large number of studies have investigated the influence of internal mechanisms on the value of the firm. These have examined, among others, the percentage of insiders on the board, the tenure of directors and managers, the share ownership of insiders (managers and members of the board) and the size of the board of directors.

However, recent research using U.S. data suggests that the presence of women on the board also affects firm value: for example, Kesner (1988), Bilimoria and Piderit (1994), Daily et al. (1999), Carter et al. (2003), and Farrell and Hersch (2004). This raises the issue of how board diversity can affect firm value. Robinson and Dechant (1997) provide some reasons. First, they argue that diversity contributes to a better knowledge of the market. Second, that diversity increases creativity and innovation. Third, that diversity can enhance problem solving and, finally, that diversity involves a better understanding of the environment.

Farrell and Hersch (2004) argue that there are societal pressures to increase the proportion of women on the board. If women are scarce commodities, they may choose to serve on better performing firms. This suggests a positive relationship between the

presence of the women on the board and firm value. It is also possible that the two variables are endogenously defined.

Others authors, such as Nowell and Tinkler (1994), suggest that women are more cooperative than men, while Brown-Kruse and Hummels (1993) argue that the opposite is true. Andreoni and Vesterlund (2001) argue that men are more altruistic than women when the cost of altruism is low, and the opposite when this cost is high. Jianakoplos and Bernasek (1998) argue that women are more risk averse than men. Cox and Blake (1991) propose that women increase the costs of the firm as a result of higher turnover and absenteeism. Carter et al. (2003) argue that the presence of women can increase conflicts on the board but, that it can also increase board independence, which could reduce agency conflicts in the firm (Fama and Jensen, 1983). However, Adams and Ferreira (2002) and Brancato and Patterson (1999) argue that the gender of a board member does not imply any different behaviour in the management of the firm.

These different arguments encompass both positive and negative (and neutral) associations between the presence of women on the board of directors and firm value. The empirical evidence is also inconclusive. For example, Shrader et al. (1997) find a negative and significant relationship between the percentage of female board members and several accounting measures of financial value, while Carleton et al. (1998) obtain very similar results. Adams and Ferreira (2002) find that the presence of women on the board has a positive impact on Tobin's Q, while Carter et al. (2003) find a positive, reciprocal, relationship between Tobin's Q and two measures of womens' board presence. Erhardt et al. (2003) report that the percentage of women on the board is positively associated with the return on assets and the return on investment.

Catalyst (2004) finds that firms with more women on the board report better accounting performance than firms with a lower percentage of women. Farrell and

Hersch (2004) report a non-significant stock market reaction to the announcement of female additions to the board. They also report that women had a higher probability of serving on the boards of better performing firms. However, they are unable to conclude that more boards with greater gender diversity generate better performance. In contrast, Rosenstein and Wyatt (1990) and Block (1999) observe that announcements of female board appointments generate positive abnormal stock market returns.

The objective of this paper is to examine the impact of the presence of women on the board of directors. Our study consists of two parts. In the first part we study the relationship between female board presence and firm value. Two variables are used to measure the presence of women: a dummy variable that indicates the existence of one or more women on the board, and the percentage of women on the board. We measure firm value using an approximation of Tobin's Q. We also contemplate the possible endogeneity of the relationship between the presence of women on the board and firm value. In the second part of the study we use the event study methodology to examine the impact of adding a woman to the board on the stock market value of the firm.

In our view this work makes various contributions to the literature. First, it adds to the very scarce empirical evidence on the topic. As far as we know, only a few papers examine the effect of gender on firm value, and only for the U.S. market. This market, due to its legal system, is part of the so-called Anglo-Saxon (common law) system. There is no evidence from markets which operate the civil law system that is common in most European countries.¹

Second, part of our analysis makes use of panel data methodology, which is more powerful in controlling for unobservable heterogeneity, which is not taken into account by the majority of published studies. Finally, this is the first study to examine 'the gender effect' in the Spanish market.

Our results show that the presence of women on the board has an insignificant effect on firm value, as measured by our proxy for Tobin's Q. We also find that firm value does not influence the gender diversity of the board. Finally, we find that adding a woman to the board has a positive effect on the market value of the firm when we use a non-parametric test, although this relationship is inconclusive when a parametric test is employed.

The remainder of the paper is structured in four sections. In the following section we describe the data selection process and the characteristics of our sample. In the third section we describe the methodology employed and in section four we report our results. Finally, we present our main conclusions in the final section.

2. SAMPLE AND DATA

In this section we describe the two different samples used in our analysis: the first for the panel data analysis and the second for the event study analysis.

Panel data analysis

The sample is made up of non-financial firms listed on the continuous market in Madrid during the period January 1995 to December 2000. Due to some limitations in the availability of the data, the sample comprises 68 companies and 408 observations. The identity of the directors, and the dates on which they were appointed, were obtained from the register of directors of the Spanish Stock Exchange Commission (CNMV),ⁱⁱ which provides details of the date of appointment and termination and the posts of each member of the board of directors of listed companies. From the register of directors we also calculated the number of board members. The accounting data were obtained from

the SABIⁱⁱⁱ database. Finally, the number of shares and the share prices were obtained from the annual Madrid stock exchange list.

As measures of firm value we use an approximation of Tobin's Q (Q), defined as the sum of the market value of stock and the book value of debt divided by the book value of total assets. The measures of firm value adopted in other corporate governance studies vary considerably, but can generally be divided into two groups: those that use mainly accounting measures, and those that use Tobin's Q . The main difference is that accounting results are based on events that have already occurred, and thus offer a view of the past, while Tobin's Q focuses on future expectations. More recent research tends to use Tobin's Q .^{iv}

As proxies for the presence of women on the board, we first use the percentage of woman on the board, PWOMEN, calculated as the number of women on the board divided by the total number of directors. The second variable is a dummy, DWOMAN, that takes a value of 1 when there is one or more women present on the board.

We also include a number of control variables. Specifically, the logarithm of the total number directors, LNDIR; the debt level, LEVER (calculated as the ratio of total debt to total assets); the return on assets, ROA, and the size of the firm, SIZE (approximated by the natural logarithm of total assets).

In table 1 we report the descriptive statistics of all variables. The approximation to Tobin's Q (Q) has a mean value of 1.6, close to the values obtained by Demsetz and Villalonga (2001) for the American market (1.1), Hillier and McColgan (2001) in the United Kingdom (1.96), and López-Iturriaga and Rodríguez-Sanz (2001) in the Spanish market (1.01, 1.44 and 1.23, for different years).

INSERT TABLE 1 ABOUT HERE

The mean percentage of women on Spanish boards of directors, PWOMEN, is 3.2%. This is lower than the numbers reported for the U.S. market. For example, Carter et al. (2003) report a value of 9.6%, Farrell and Hersch (2004) a value of 6.9% and Catalyst (2004) a value of 10.2%. However, the greatest difference between Spain and the U.S. is apparent when we observe the percentage of firms with one or more women on the board, DWOMAN. Only 23.7% of Spanish quoted firms have one or more women on their board, while the comparative value for the U.S. (Farrell and Hersch, 2004) is 70%. The incorporation of women into the workplace has been slower in Spain than in other developed countries, a fact reflected in our results.

The mean value of the number of directors (NDIR) is 10.75, the same as that found by Fernández et al. (1998) in their study of the Spanish market. This board size is consistent with the recommendations of the Olivencia code for an ideal board size of between 5 and 15 members. The average board size in the U.S. is also similar to that reported in our study. For example, Carter et al. (2003) report a mean value of 10.9 while Farrell and Hersch (2004) report a value of 11.7. In the U.K., Beekes et al. (2004) report a mean board size of 8.2.

Finally, the means of our leverage variable, LEVER, the return on assets variable, ROA, and the firm size variable, SIZE, are 38%, 5.4% and 5.3, respectively. For comparison, Demsetz and Villalonga (2001) report a value of 19% for leverage and 9.46 for firm size in the U.S.

Event Study Analysis

To carry out this analysis we collected all announcements of board appointments to quoted Spanish firms from 1989 to 2001. The dates of the announcements were obtained from the “previous communications” section of CNMV. The numbers of appointments are reported in table 2 on a year-by-year basis. We can observe that the total number of appointments over this period was 4050, of which only 105 (2.59%) correspond to the appointment of women.

INSERT TABLE 2 ABOUT HERE

The relative stability of the number of female appointments each year is also evident from table 2. It is apparent that the appointment of women members by Spanish boards is not on the increase. In contrast, Farrell and Hersch (2004) demonstrate that the percentage of women appointed to U.S. boards has grown every year from 1990 to 1999.

We analysed all announcements in the event period to identify other announcements (such as dividends, capital issues, capital reductions, splits and mergers) occurring at the same time that might contaminate our sample. This process identified a total of 47 such announcements, affecting 29 different firms. Table 3 reports the distribution of female appointments by sector, based on the classification of the Madrid Stock Exchange. We can observe that the majority of firms appointing women belong to the consumption goods sector and the financial services and state agents sector.

INSERT TABLE 3 ABOUT HERE

Finally, we used daily price data to calculate stock returns. These prices, adjusted for dividend payments, were obtained from the Madrid Stock Exchange database.

3. METHODOLOGY

In order to carry out our study we use two different methods: panel data analysis and an event study.

Panel data methodology

This methodology allows us to eliminate any unobservable heterogeneity that may be present among the companies in our sample. If unobservable heterogeneity (highlighted by Himmelberg et al., 1999, among others) is correlated with the explanatory variables, thereby biasing the coefficients obtained, we undertake a conditional inference (estimation by fixed effects). However, if the effects are not correlated with the independent variables, we instead carry out unconditional inference using the random effects method (Arellano and Bover, 1990).

To test for the existence of any correlation between unobservable heterogeneity and the explanatory variables, we use the Hausman test. This test examines the equality of the coefficients of the fixed effects estimations and the random effects estimations. The null hypothesis is that the coefficients of both models are similar. If this hypothesis is rejected, the coefficients will differ markedly among themselves, with only the intragroup estimation (fixed effects) being consistent. In addition, in order to control for the possible endogeneity of the variables, which could bias the coefficients obtained, the estimation is carried out with panel data using two-stage least squares (2SLS).

To determine the nature of the relationship between female board membership and firm value we estimate two different models. In the first, Tobin's Q is the dependent variable and measures of female board representation are the independent variables. We estimate the following model:

$$Q_{it} = \mathbf{b}_0 + \sum \mathbf{b}_j PWOMEN (DWOMAN)_{jit} + \sum \mathbf{b}_j CV_{jit} + \mathbf{y}_t + \mathbf{h}_i + \mathbf{e}_{it} \quad (1)$$

where Q represents firm value (our proxy for Tobin's Q), PWOMEN is the percentage of women on the board of directors, and DWOMAN is a dummy variable that takes a value of one when one or more women are present on the board, and zero otherwise. CV represents the control variables (LEVER, ROA and SIZE).^v Finally, the expressions ψ_t and η_i refer to time effects and unobservable heterogeneity, respectively.

It is not clear, a priori, how female board membership (PWOMEN and DWOMAN) influence firm value (Q). On the one hand, greater gender diversity may be associated with more imaginative company policies (thus generating a positive sign). On the other hand, the presence of women may lead to greater conflict on the board, or women may be appointed due to social pressure rather than on the basis of merit (thus implying a negative sign). Finally, an insignificant relationship would be expected if gender, in fact, has no influence on firm value.

We expect the sign of the leverage variable, LEVER, to be positive if debt is an efficient mechanism for reducing the agency conflict in the firm. The expected sign for the firm size, SIZE, is negative, while that of ROA is positive.

In the second model we consider the possibility that the relationship between the variables representing female board membership and Tobin's Q may be endogenously determined. To account for this we specify firm value as an independent variable and PWOMEN and DWOMAN as dependent variables. We thus use the following model:

$$PWOMEN (DWOMAN)_{it} = b_0 + \sum b_j Q_{jit} + \sum b_j CV_{jit} + y_t + h_i + e_{it} \quad (2)$$

where CV represents the logarithm of the number of directors, LNCON and the size of the firm, SIZE. The other variables are the same as this specified in Model (1).^{vi}

The effect of firm value on female board representation will be positive if women choose to work in better performing firms. Finally, we postulate that larger firms, and firms with larger boards, will be more likely to employ female board members.

Event Study methodology

In the second part of the paper we examine the stock market reaction to the announcement of female board appointments using the event study methodology.

The valuation effect of firm i in day t is measured by the abnormal returns, $AR_{i,t}$, calculated as the actual returns, $R_{i,t}$ minus expected returns (Martín, 2003b):

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (3)$$

We use the Ordinary Least Square (OLS) Market Model to calculate expected returns. The estimation window used is (-120, -20) and the event window is (-10, 10), with -1 beginning on the event day.

The following expression is used to estimate the average abnormal return during day t , AAR_t :

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (4)$$

where N is the number of shares in the sample.

We sum the average abnormal returns across days to calculate the cumulative average abnormal returns, $CAAR_{(T_1, T_2)}$, where T_1 and T_2 are the actual days in the event period. The expression is the following:

$$CAAR_{(T_1, T_2)} = \frac{1}{N} \sum_{i=T_1}^{T_2} AAR_{i,t} \quad (5)$$

Two tests are used to analyze the abnormal returns' statistical significance. The first is a parametric test (Share Time Series method) and the second is a non-parametric test (Corrado, 1989).

The Share Time Series method standardises each share's abnormal return by its estimation period standard error. The test statistic for the average abnormal return in day t is the following:

$$\frac{ASE_t}{s(SE)/\sqrt{N}} = \frac{\sum_{i=1}^N SE_{it}}{\sqrt{N}} \quad (6)$$

where $SE_{i,t}$ is the standardised error, ASE_t represents the average standardised error for time t , $s(SE)$ is the standard deviation of the SEs. Finally, \sqrt{N} indicates the square root of the number of shares.

The Corrado (1989) non-parametric test does not rely on normality assumptions and also is more suitable in situations where variance increases (Seiler, 2000). Friederich et al. (2000) affirm that this test, in several simulations, proves to be more robust than others.

To implement this test, we need to sort and transform the series of abnormal returns into their respective ranks, for both the estimation period and event window. In this way, $k_{i,t} = rank(AR_{i,t})$ where $t = t_1, \dots, t_2$. If $AR_{i,t} > AR_{i,j}$ then, $k_{i,t} > k_{i,j}$. The median

rank of the share i is $\bar{k}_i = \frac{t_1 + t_2 + 1}{2}$. The rank statistic is calculated using the following

formula:

$$Z = \frac{\frac{1}{N} \sum_{i=1}^N (k_{i,t} - \bar{k}_i)}{\hat{\sigma}(k)} \quad (7)$$

where $\hat{\sigma}(k)$ is the estimated standard deviation of the portfolio mean abnormal return

rank over estimation and event windows. The expression used is the following:

$$\hat{\sigma}(k) = \sqrt{\frac{1}{t_1 + t_2} \sum_{t=1}^T \left(\frac{1}{N} \sum_{i=1}^N (k_{i,t} - \bar{k}_i) \right)^2} \quad (8)$$

Finally, the Corrado (1989) statistic (Z) is asymptotically unit normally distributed.

4. RESULTS

Panel data results

The results of our tests of models (1) and (2) are presented in tables 4 and 5. Thus, in table 4 we present the relationship between the percentage of women on the board and Tobin's Q while in Table 5 we report the effect on firm value of the presence of one or more women on the board, and *vice versa*. All of the estimations were carried out using fixed effects, since the Hausman test was significant.

In Table 4 we can observe that the percentage of women on the board (PWOMEN) is not significantly related to our approximation of Tobin's Q. Therefore, we do not find that board gender affects firm value, and our result is therefore consistent with the argument expressed by Adams and Ferreira (2003). This result is contrary to those reported in several U.S. studies, where the sign is positive and significant. As we

show below, the inclusion of women on Spanish boards is very low, in comparison to the U.S., and female board members are predominantly found among family-owned firms. However, female board appointments in the U.S. are more influenced by women's qualifications. These characteristics may explain the differences between the two markets.

INSERT TABLE 4 ABOUT HERE

As far as the control variables are concerned, we note that firm leverage (LEVER) does not have a significant effect on Tobin's Q. On the one hand, a high level of debt may imply more control over insiders by creditors, but it may also be associated with higher bankruptcy costs. The result reported here is indeterminate. Return on assets (ROA) has a positive influence on Tobin's Q, which is unsurprising as more profitable firms are more likely to have a higher value. Finally, we observe that firm size (SIZE) has a negative influence on Tobin's Q.

From the final column of table 4, we can observe that the impact of firm value (Q) on the percentage of women on the board (PWOMEN) is not significant. Therefore, it seems that women do not choose to serve on the boards of the more profitable Spanish firms. Female board appointments are more likely to be related to family links than to any external process.

However, the logarithm of the number of directors (LNDIR) has a positive and significant effect on the percentage of women on the board (PWOMEN). It is logical to surmise that in larger boards there is a greater probability that a woman will be employed. Finally, we can observe that firm size (SIZE) does not have a significant effect on the PWOMEN variable.

The results presented in table 5 are very similar. Thus, female board presence (DWOMAN) does not have a significant impact on Tobin's Q and *vice versa*. This confirms the evidence reported in table 4.

INSERT TABLE 5 ABOUT HERE

Concerning the control variables, we also find that return on assets (ROA) and firm size (SIZE) have, respectively, a positive and a negative impact on firm value. The logarithm of the number of directors (LNDIR) is also positively related to the variable measuring the presence of woman on the board (DWOMAN). Finally, firm size (SIZE) has a negative impact on DWOMAN. This result is contrary to our expectations, so it would seem that in the more family-owned firms and the smaller firms it is more likely that woman are appointed to the board.

Event study results

We report the results of the event study analysis in tables 6 and 7. The first table presents average abnormal returns and cumulative average abnormal returns for each day during the event window, while table 7 shows the same information for several time intervals.

From table 6 we can observe a positive abnormal return on day -2, which is significant using both the Share Time Series test (10% level) and the Corrado (1986) test (5% level). We can also observe a positive and significant abnormal return on day +1, but only using the Corrado (1986) test. Therefore, it seems that the announcement of female appointments to Spanish boards is positively viewed by investors. This evidence is similar to that reported by Rosenstein and Wyatt (1990) and Block (1999).

INSERT TABLE 6 ABOUT HERE

From table 7 we can observe that the sample companies earn positive abnormal returns in different windows surrounding the announcement date. Specifically, for the Corrado (1986) test we can observe that the abnormal returns are significant at the 1% level in the (-2, 2) window, and that they are also significant in the (-1, 1) and (3, 3) windows, but at the 5% level. Using the Share Time Series test, however, we find that abnormal returns are not significant in all cases, which is similar to the results reported by Farrell and Hersch (2004) for the U.S. market. As a result, we are unable to draw any firm conclusion about the impact of female board appointments. However, we believe that the Corrado (1986) test is a more appropriate test, owing the size of the sample (Martín, 2003a).

INSERT TABLE 7 ABOUT HERE

5. CONCLUSIONS

In this paper we study the impact of the gender composition of Spanish boards of directors. Spain can be characterised as a country that has a low proportion of women occupying highly responsible positions in business, a situation that does not seem to have improved over the last decade.

Two forms analyses are carried out: in the first, we examine the relationship between women's presence on the board, measured by several variables, and firm value (measure by a proxy for Tobin's Q) using a panel data methodology. In the second, we

examine the stock market reaction to the announcement of a woman's appointment to the board of directors using an event study.

One of the contributions of this study is that, to the best of our knowledge, it is the first to examine this issue in the context of the Spanish market, or indeed in any other market classified under the continental system. As far as we are aware, all existing studies have been undertaken in markets classified as Anglo-Saxon. A second contribution arises from the fact that existing studies do not use panel data to control for potential biases in the estimation procedure.

Our findings demonstrate that both the percentage, and the presence, of women on the board of directors do not affect firm value. We also show that firm value has no influence on these two variables.

With regards to the event study analysis, our evidence is inconclusive. We observe positive abnormal returns around the announcement of a woman's appointment to the board of directors when we use a non-parametric test. However, we do not find a significant stock market reaction when we use a parametric test. Nevertheless, we consider the non-parametric test to be more appropriate, given the characteristics of our sample.

ⁱ The differences between the systems revolve around three fundamental points. The countries in the Anglo-Saxon system tend to have more dispersed ownership structures, stronger investor protection, and a greater relative weight accorded to external control mechanisms. For a more detailed discussion of both systems, see Porta et al. (2002).

ⁱⁱ Comisión Nacional del Mercado de Valores.

ⁱⁱⁱ System of Analysis of Iberian Balance Sheets, provided by Bureau Van Dijk.

^{iv} For further detail on these measurements, see Demsetz and Villalonga (2001).

^v The selection of the control variables is based on the previous work of Morck et al. (1988), Yermack (1996), Carter et al. (2003), and others.

^{vi} For the control variables, we use those in Carter et al. (2003).

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Table 1: Descriptive Statistics

	Mean	Median	Standard Deviation	Minimum	Maximum
Q	1.642	1.287	1.220	0.3318	10.763
PWOMEN	3.283	0.000	7.157	0.000	40.000
DWOMAN	0.237	0.000	0.426	0.000	1.000
NCON	10.750	10.000	4.518	2.000	26.000
LNCON	0.9912	1.000	0.193	0.301	1.415
LEVER	0.384	0.383	0.214	0.000	0.9830
ROA	5.482	4.450	7.594	-19.420	38.120
SIZE	5.535	5.447	0.667	3.778	7.680

Variables: Q (approximation of Tobin's Q), PWOMEN (percentage of women on the board of directors, %) DWOMAN (binary variable that takes a value of 1 when there is at least one woman on the board of directors, and 0 otherwise), NCON (number of directors on the board), LNCON (logarithm of the number of directors on the board), LEVER (total debt over total assets), ROA (return on assets, %), SIZE (logarithm of the book value of the total assets of the firm).

Table 2: Appointment of Directors to Spanish Quoted Firms: 1989 to 2001

Year	Women		Men		Total	
	Number	%	Number	%	Number	Annual %
1989	15	1.87	786	98.13	801	19.78
1990	3	1.60	185	98.40	188	4.64
1991	4	2.26	173	97.74	177	4.37
1992	9	3.61	240	96.39	249	6.15
1993	7	3.04	223	96.96	230	5.68
1994	9	3.31	263	96.69	272	6.72
1995	9	4.48	192	95.52	201	4.96
1996	10	3.50	276	96.50	286	7.06
1997	6	1.83	322	98.17	328	8.10
1998	10	3.72	259	96.28	269	6.64
1999	7	1.97	349	98.03	356	8.79
2000	9	1.98	445	98.02	454	11.21
2001	7	2.93	232	97.07	239	5.90
Total	105	2.59	3945	97.41	4050	100.00

Table 3: Announcements of Women’s Appointments to Boards of Directors by Sectors (following the classification of the Madrid Stock Exchange)

Sector	Number of Announcements	Number of Firms
Consumption Goods	12	8
Basic Materials, Industry and Building	2	2
Technology and Telecommunications	3	2
Consumption Services	5	3
Petroleum and Energy	5	4
Financial Services and State Agents	20	10
Total	47	29

Table 4: 2SLS Panel Data Regression of the Percentage of Women on the Board of directors (PWOMEN) and Tobin’s Q (Q)

	Q	PWOMEN
Constant	4.118 (3.71***)	6.677 (0.64)
Q		-2.132 (-1.11)
PWOMEN	-0.010 (-0.13)	
LNDIR		6.436 (2.22**)
LEVER	-0.606 (-1.63)	
ROA	0.023 (2.27**)	
SIZE	-0.422 (-1.87*)	-1.132 (-0.74)
Wald Chi ²	2020.54***	249.80***
R ²	0.075	0.061
Hausman Test	28.61***	19.48***

Note:

***, **, * denote significance at 1%, 5%, and 10% levels, respectively.

Table 5: 2SLS Panel Data Regression of a Binary Variable that takes the value of 1 when there is at least one woman on the Board of Directors (DWOMAN) and Tobin's Q (Q)

	Q	DWOMAN
Constant	4.183 (3072***)	0.356 (0.54)
Q		0.028 (0.819)
DWOMAN	-0.071 (-0.13)	
LNDIR		0.941 (5.12***)
LEVER	-0.611 (-1.64)	
ROA	0.024 (2.58***)	
SIZE	-0.437 (-2.09**)	-0.198 (-2.03**)
Wald Chi ²	20.38.42***	344.69***
R ²	0.099	0.013
Hausman Test	25.47***	26.91***

Note:

***, ** denote significance at the 1% and 5% levels, respectively.

Table 6: Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CAARs) in the Event Period. Date of communication to the CNMV.

Day	AAR (%)	CAAR _(t,0) (%)	Statistical Tests	
			Share Time Series	Corrado
-10	-0.20	-0.81	-0.70	0.08
-9	0.24	-0.60	0.60	0.61
-8	-1.05	-0.85	-2.151**	-2.90**
-7	0.37	0.21	0.71	0.60
-6	0.34	-0.16	1.58	0.55
-5	0.00	-0.49	-0.01	-0.46
-4	-0.75	-0.49	-2.98***	-2.38**
-3	-0.51	0.26	-1.49	-0.86
-2	0.67	0.77	1.872*	2.21**
-1	0.13	0.10	0.581	0.56
0	-0.03	-0.03	-0.15	0.16
1	0.25	0.22	1.41	1.35*
2	-0.22	0.00	-0.87	-1.17
3	-0.38	-0.38	-1.18	-0.57
4	-0.13	-0.51	-0.48	-0.60
5	-0.22	-0.73	-0.81	0.08
6	-0.04	-0.77	-0.12	-0.39
7	0.13	-0.64	0.51	0.83
8	0.37	-0.27	1.979*	1.10
9	0.08	-0.19	0.46	0.77
10	-0.22	-0.42	-0.98	-1.63

Notes:

***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

The CNMV is a Spanish institution similar to the U.S. SEC.

Table 7: Cumulative Average Abnormal Returns (CAARs) for Different Periods

Period	CAAR _(t1,t2) (%)	Statistical Tests	
		Share Time Series	Corrado
(0,1)	0.219	0.769	1.499*
(-1,0)	0.102	0.325	0.712
(-1,1)	0.350	0.894	2.055**
(-2,2)	0.800	1.212	3.092***
(-3,3)	-0.089	-0.156	1.664**
(-7,7)	-0.403	-0.483	-0.098
(-9,9)	-0.767	-0.875	-0.520
(0,10)	-0.415	-0.668	-0.084
(4,10)	-0.039	-0.066	0.115

Note:

***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

APPENDIX

Appendix: Correlation Matrix

	PWOMEN	DWOMAN	LNCON	LEVER	ROA	SIZE
Q	0.281***	0.205***	-0.337***	-0.099**	0.466***	-0.101**
PWOMEN		0.822***	-0.040	-0.081	0.179***	0.015
DWOMAN			0.127***	-0.043	0.235***	0.079
LNCON				-0.073	-0.099***	0.381***
LEVER					-0.201***	0.115**
ROA						0.051

Note:

***, ** denote significance at 1% and 5% levels, respectively.