
EXECUTIVE DIRECTORS' COMPENSATION AND MONITORING: THE INFLUENCE OF GENDER DIVERSITY ON SPANISH BOARDS

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Abstract. This study presents evidence of the influence of gender diversity on the pay system and the monitoring of executives in Spain. In this country/context, characterized by a few male dominant shareholders acting simultaneously as executives, there is an ongoing discussion regarding the enactment of laws to promote gender equality on the boards of directors of large listed companies. This paper presents several contributions. On the one hand, the scarce previous evidence on this topic is focused on US firms. On the other hand, this study includes the role of ownership structure as a factor that indirectly moderates the relationships between gender diversity on board and monitoring effectiveness in terms of executive directors' compensation. Furthermore, this paper makes an important effort to control endogeneity. The sample examined includes 120 companies listed on the Spanish stock market during the period 2004–2011. The results show a positive and highly significant effect of the presence of women independent directors on the proportion of variable pay in the compensation of executive directors. Our findings also point out the negative moderating effect of ownership concentration: the more concentrated is ownership in the hands of internal majority shareholder, the less is the link between board diversity and pay-for-performance systems.

Keywords: executive compensation, gender diversity, board of directors, ownership structure, agency theory, institutional context, Spanish listed firms.

JEL Classification: G34, J16, J31.

Introduction

In developed countries, the increasing presence of women in the labour market is leading to changes in corporate structures and the functioning of businesses. However, a similar change has not occurred in all of them and, nowadays, Spain is one of the countries with the lowest proportion of women directors in the European Union (Heidrick, Struggles 2011; Mateos de Cabo *et al.* 2011). To correct this situation, the Spanish

Government has made a series of legislative changes in recent years. In 2006 the Comisión Nacional del Mercado de Valores, CNMV (the Spanish equivalent to the American SEC) introduced the Código Unificado de Buen Gobierno [Unified Good Governance Code], that recommends that boards reflect gender diversity. Ley Organica (2007) Igualdad Efectiva de Mujeres y Hombres [Gender Equality Act], imitating 2003 Norwegian norms, suggests – just as a recommendation – that at least 40% of directors be women by 2015. Recently, Ley Organica (2011) Economía Sostenible [Sustainable Economy Act] promote gender equality in boards of public administration, public services and public universities.

Several studies have analysed the direct effect of gender diversity on boards in terms of corporate performance (Krishnan, Park 2005; Dezso, Ross 2012; Mahadeo *et al.* 2012) but little attention has been paid to the influence of women directors through the process of monitoring and compensation of executives (Adams, Ferreira 2009). From an agency theory viewpoint, diversity in a board of directors may favour the alignment of interests between owners and executives (Hillman, Dalziel 2003; Bear *et al.* 2010), promoting greater monitoring through the design of executives' compensation linked to firm performance, which would encourage executives to maximise the company's value (Devers *et al.* 2007).

However, the particular context of corporate governance may alter the general assumptions of agency theory. In the case of Spanish listed firms, representative of Continental European countries, the ownership structure is highly concentrated in the hands of a few majority shareholders and the differentiation between directors and executives is much more reduced. Directors are, in most cases, direct representatives of the controlling shareholders which used to act as executives as well (La Porta *et al.* 1999; Leech, Manjon 2002). Thus, this corporate governance context represents from an agency view a principal-principal conflict (Johnson *et al.* 2000; Young *et al.* 2008; Van Buren III 2010), where the internal majority shareholders may have both the incentives and power to connive with executives, “tunneling” wealth of minority shareholders through compensation – fixed salaries not linked to company performance – or related party transactions (Morck *et al.* 2005).

This situation may affect the influence of gender diversity on the supervisory effectiveness of the boards of Spanish listed firms. Considering the characteristics of the ownership structure and the type of control in Spanish listed firms, the presence of independent women directors could significantly improve the effectiveness of board that, at the end, determine the design of executive directors' compensation. Since gender diversity on boards is positively associated with better monitoring and decision-making (Daily, Dalton 2003; Terjesen *et al.* 2009; Nielsen, Huse 2010; Jurkus *et al.* 2011), in a context of poor corporate governance, and increasing presence of independent women directors encourage the implementation of pay-for-performance systems for executive directors that contribute to the alignment of interests and minimization of agency cost (Conyon, He 2011).

Thus, the main objective of this paper is, considering ownership structure as a moderating factor of corporate governance, to examine the extent to which gender diversity

on boards of directors may influence the effectiveness of their supervision in terms of executive directors' compensation design as a mechanism favouring the alignment of interests, analysing a Spanish panel data for the period 2004–2011. Several specific contributions are produced by this research. First, previous evidence on this topic is scarce and mostly focused on US firms. This study makes it possible to understand these relationships in a very different context of corporate governance, contributing to the growing number of country-specific studies by providing original empirical evidence from the Spanish case (Adams, Ferreira 2009). Second, considering the specific context of corporate governance, this study includes the role of ownership structure as a factor that indirectly moderate the relationships between gender diversity on board and monitoring effectiveness in terms of executive directors' compensation. It is important to consider ownership as a moderator especially in non-Anglo-Saxon countries, where the level of concentration in a few majority shareholders may change the nature of potential conflicts inside the companies, highlighting the role of executive directors to the detriment of non-directors' executives (Baixauli-Soler, Sanchez-Marin 2011, 2015). Furthermore, in the empirical side, this paper has an important effort in order to effectively control the endogeneity problems using System GMM since causality between board gender diversity and executive director's variable compensation runs in both directions.

In order to carry out this research, a thorough review of the theory of principal-principal conflict was conducted, with specific reference to gender diversity, board effectiveness, and executive directors' compensation. This review is reported in the first section. After that, the sample, variables and methodology used are described in the second section. The main results are set out in the third section, and, finally, the main conclusions and the discussion are showed.

1. Theoretical framework and hypotheses

Agency theory argues that, given the information available and the preferences of principals and agents, the optimal compensation contract that governs the rewards of executives is one that links compensation to the economic value of company (Jensen, Murphy 1990; Devers *et al.* 2007)¹. But the literature goes beyond the strict boundaries of the contract, examining supervisory relationships between owners and executives, and their

¹ Agency theory does not provide a clear prediction for the correlation of executives' compensation and firm performance (Gomez-Mejia, Wiseman 1997; Devers *et al.* 2007). On one hand, there is a "dark side" of incentives, under normative predictions of agency theory when variable compensation reached a high proportion in terms of total compensation affect negatively executives' behaviors and, ultimately, firm performance (Mayer 2013). On the other hand, we can also assume the arguments of agency theory in its positive stream, which predict that starting from low levels of variable pay – as it is the most usual in the compensation package of listed firms- pay-for-performance systems contribute positively to firm performance. This interesting and complex debate is unresolved to date – see, for example, excellent review of Devers *et al.* (2007), surpassing the scope and the objective of this paper. Nevertheless, considering that in our study approximately the variable pay of executive directors only reached 24.4% of total pay, we assume that an increase of proportion of variable pay improves the monitoring of executives, aligning the principals-agents interests, and reporting positive effects in terms of firm performance.

social interactions within the corporate governance of organizations (Gomez-Mejia, Wiseman 1997). The characteristics of the ownership structure and the board of directors of the company have been the two basic mechanisms related to the ability to monitor executives and, therefore, related to the design of adequate compensation packages (Khan *et al.* 2005; Kumar, Sivaramakrishnan 2008; Dalton, D. R., Dalton, C. M. 2011).

Studies have attempted to determine how the specific context of corporate governance – in the presence of certain conditions of both the board of directors and the ownership structure – influence the optimal compensation schemes that maximize the value of the company. For instance, Spanish listed companies represent a system of corporate governance typical of continental European countries, characterized by a highly concentrated ownership in the hands of a few controlling shareholders, widespread property conflicts between dominant shareholders, slow change in the ownership of blocks of shares that confer control, and a reduced market for corporate control due to the low level of development of capital markets (La Porta *et al.* 1999). To this must be added the lack of protection the law gives minority shareholders who have no ability to control and the presence of non-dual organic structures, in which a single board simultaneously performs supervision and direction (La Porta *et al.* 1999; Leech, Manjon 2002).

Thus, the main problem affecting the design of the executives' compensation is not the principal-agent conflict that has developed in Anglo-Saxon firms from the perspective of the hypothesis of managerial power, which analyses the possible expropriation of rents by executives through their influence on the design of their own compensation (Bebchuk *et al.* 2002). In Spain arises a potential principal-principal conflict in which dominant shareholders control the board of directors (Johnson *et al.* 2000; Morck *et al.* 2005; Young *et al.* 2008). Although these majority shareholders have the incentive and the power to supervise and influence executives through a proper design of their compensation, they also have the moral hazard of entering into collusion with the executives even appoint themselves as executive directors, setting high pay levels not linked to company performance, producing a potential expropriation of minority shareholders (Conyon, He 2011). Therefore, the following arguments for our hypotheses consider these assumptions as a way of analysing the position and role of women on Spanish boards in setting executive directors' compensation.

1.1. Gender diversity and board of directors

The board of directors is responsible for supervising and validating most important corporate decisions, among which it is the design of executives' pay packages. Board of directors links compensation to company performance to encourage executives to achieve corporate goals. Achieving effective supervision depend basically on the independence of the board of directors regarding the balance between internal and external board members (Higgs 2003; Hillman, Dalziel 2003; Dalton D. R., Dalton C. M. 2011; Kulich *et al.* 2011). There is a general consensus in the literature that a higher percentage of independent directors – both in boards and in compensation committees – favour more effective supervision and a greater ability to design compensation packages that aligns the interests of executives with those of the owners (Conyon, He 2004; Brick *et al.* 2006; Sapp 2008).

There has also been a great interest in investigating the way in which the presence of women as independent directors may favour the monitoring of executives directors. Globally, literature shows that women professionalism and additional qualities can provide the necessary independence to the board of directors and compensation committees (Hillman, Dalziel 2003; Adams, Ferreira 2009) to rightly monitor, evaluate and compensate executives, guiding their efforts to achieve the company's objectives (Daily, Dalton 2003; Bear *et al.* 2010). Several reasons are behind this affirmation. First, women tend to show a greater willingness to work together and collaborate on conflict resolution, promoting effective communication between boards of directors and interest groups (Kramer *et al.* 2006; Konrad *et al.* 2008). Second, they also tend to participate actively in meetings through comprehensive and effective planning concerning the issues to be dealt with (Israeli 2000). And third, they raise complex issues regarding the future of the company that require more detailed, concise and planned answers, correcting information biases both in the formulation of strategies for companies and in the resolution of important problems (Westphal, Milton 2000). In addition, literature also demonstrate that gender diversity incorporates demographic differences on the boards that are crucial to exercise a more global and independent monitoring of executives, helping to reduce agency costs and increasing the company value (Adams, Ferreira 2009; Nielsen, Huse 2010).

Although these relationships have been confirmed for US firms (Adams, Ferreira 2009), in the case of Spanish listed firms the situation concerning women on boards is quite distinct because of the institutional context of corporate governance. In general, Mateos de Cabo *et al.* (2011) find evidence of several source of discrimination behind the scarce presence and proportion of independent women on Spanish boards of directors. Additionally to this masculinity of the Spanish boards, Sanchez-Marin *et al.* (2010) find that the executives' compensation is more strongly influenced by the social interactions between directors and executives than by economic and market factors, as a consequence of the high number of directors with strong relationships with the management of the firm, and the weak influence of independent directors on compensation committees. As Baixauli-Soler and Sanchez-Marin (2011, 2015) state, boards tend to be more interested in improving their legitimacy than in relating executives' compensation to firm performance, encouraging rent extraction through executives' pay at the expense of minority shareholders. Spanish executives will be more likely to secure increases in their pay levels through the boards of directors, as a consequence of the great importance of social comparison and legitimacy factors for business relations.

In this situation, gender diversity, in the form of independent women in boards or compensation committees, may compensate for the low effective monitoring of Spanish boards. Since gender diversity is associated with a greater diversity of knowledge and skills, as well as a variety of appropriate criteria for making decisions (Terjesen *et al.* 2009; Nielsen, Huse 2010; Jurkus *et al.* 2011), one might expect gender diversity to produce better information and supervision of executive directors (Daily, Dalton 2003; Bear *et al.* 2010), and an increased tendency to establish a compensation design

more closely linked to firm performance. Thus, starting from these basis, a board will be more effective in its monitoring if the number of independent women, either in the boardroom or on the compensation committee, is greater.

H1: Gender diversity in the composition of the board of directors (in the role of independents) leads to a greater proportion of executive directors' compensation linked to firm performance.

1.2. The moderating role of ownership structure

The expected relationship in Hypothesis 1 may have different pathways in Spanish context depending on the ownership structure of firms. Empirical evidence generally supports the view that, when ownership is concentrated, executives are better monitored and the compensation they receive are more closely linked to company performance (Werner *et al.* 2005), as it can also allow for the specialization necessary to develop complex organizational structures and distribute the risk appropriately among executives and owners. However, the alleged positive relationship between concentration of ownership and executives' monitoring is not always synonymous with an alignment of interests: the owners' ability and incentive to supervise will determine the effectiveness of monitoring and rewarding executives (Shleifer, Vishny 1997).

Unlike the US context, where more dispersed ownership structures have been reported (La Porta *et al.* 1999; Leech, Manjon 2002), studies in Spanish listed companies reflect a highly concentrated ownership structure, with a few internal dominant shareholders. For instance, these studies show that the largest shareholder holds around 36% of the stock, and the top three shareholders hold around 50%, highlighting that firms are mainly dominated by (internal) individuals, companies and families, while (external) institutional investors control only 15% of firms, which is typical of countries with weak legal protection for minority shareholder interests. Thus, in Spanish listed companies we can find companies mainly controlled by internal majority shareholders (individuals, firms and families), who usually combine the roles of executives with those of directors on the board (Sanchez-Marin *et al.* 2010). That scenario, on which these controlling shareholders serve as "entrenched" executives with enough power to control the board, results in increases of expropriation of minority shareholders' wealth – or tunnelling – through related party transactions and/or compensation. The effectiveness of monitoring, whether through the board or directly through controlling shareholders, is most unlikely and therefore executives directors' compensation tends to be higher, fixed and barely linked to company performance (Baixauli-Soler, Sanchez-Marin 2011, 2015).

In this framework, the presence of independent women directors, that may balance the low monitoring effectiveness of firms controlled by internal majority shareholders as reported above, may be difficult by the internal majority shareholder. Women acting as professional experts as well as a factor of demographic diversity to provide the necessary quality and independence to the board of directors to monitor, evaluate and compensate executives (Daily, Dalton 2003; Hillman, Dalziel 2003; Bear *et al.* 2010)

might be a threaten for dominant shareholders and executives. If literature's findings specifically indicate that their presence on the board's decision-making can guide the efforts of executives to achieve the objectives of the company through the establishment of compensation related to firm performance, gender diversity may diminish the probability of tunnelling (Adams, Ferreira 2009). Therefore, in the context of Spanish listed firms, it is to be expected a negative moderating role of ownership concentration in the hands of internal majority shareholders: the more is the concentration of ownership, the less is the relationships between gender diversity – in form of independent women either in the board or in the compensation committee – and the design of compensation linked to company performance.

H2: Ownership concentration negatively moderates the relationship between gender diversity and executive directors' compensation: a higher ownership concentration reduces the positive links between independent women on the board and executive directors' compensation linked to firm performance.

2. Sample, data and methodology

The sample includes 120 companies listed on the Spanish stock market during the period 2004–2011 which do not belong to the financial sector. The total number of observations was 826. Governance reports of listed firms were obtained from the Comisión Nacional del Mercado de Valores (CNMV). From those reports, the information about the compensation of executive directors and board characteristics were collected. The information about economic-financial variables was obtained from the SABI database (System of Analysis of Iberian Balance Sheets, provided by Bureau Van Dijk).

Definition and descriptive statistics of the variables are shown in Table 1. The dependent variable, compensation linked to performance, has been measured by the variable pay obtained from governance reports. The variable pay of executive directors reported is the component of the compensation package that consists on annual bonus which is considered short-term compensation. The variable pay included in the governance reports does not contain long-term compensation (stock options, stocks or pension benefits). Following Adams and Ferreira (2009), the variable (VAR_PAY) is calculated as the logarithmic transformation of the proportion of variable pay to total compensation received by board members:

$$VAR_PAY = \log \left(\frac{PER_VAR_PAY}{1 - PER_VAR_PAY} + \mu \right),$$

where μ is a very small number. The firms' reports of corporate governance do not provide the details of the compensation received by each manager. Thus, it is logical to assume that the fixed and variable pay applies primarily to executive directors, given that external directors usually receive only benefits and perks.

Gender diversity has been measured by three measures at firm level (PER_WOM_BOA , $BLAU$, $SHANNON$) and two at board composition level (PER_IND_WOM , NUM_WOM_MEE).

Table 1. Descriptive statistics

Variable	Description	Mean	Median	Standard deviation	Minimum	Maximum
Dependent variable						
PER_VAR_PAY	Percentage of variable pay, calculated as amount of the variable as a proportion of total compensation, expressed on a per unit basis. The logarithmic transformation of this variable is included as dependent variable, according with this equation: $VAR_PAY = \log\left(\frac{PER_VAR_PAY}{1 - PER_VAR_PAY} + \mu\right)$	0.244	0.179	0.256	0.000	0.910
Gender variables						
PER_WOM_BOA	Percentage of women on the board of directors, calculated as total number of female directors divided by total number of directors, expressed on a per unit basis.	0.057	0.000	0.082	0.000	0.444
BLAU	Blau diversity index, calculated as $1 - \sum_{i=1}^n P_i^2$, where P_i refers to the percentage of female board members, expressed on a per unit basis.	0.095	0.000	0.125	0.000	0.493
SHANNON	Blau diversity index, calculated as $-\sum_{i=1}^n P_i \ln P_i$, where P_i refers to the percentage of female board members, expressed on a per unit basis.	0.159	0.000	0.200h	0.000	0.686
PER_IND_WOM	Percentage of female independent board members, calculated as the total number of independent women on the board divided by the total number of female directors, expressed on a per unit basis.	0.024	0.000	0.055	0.000	0.444
Board of Directors characteristics						
PER_EXT_DIR	Percentage of external directors on the board, calculated as total number of external directors divided by the total number of directors, expressed on a per unit basis.	0.794	0.806	0.131	0.250	1.000
DUAL	Duality, calculated as a binary variable that takes a value of 1 when the same person occupies the roles of CEO and Chairman of the board and 0 otherwise.	0.583	1.000	0.493	0.000	1.000
NUM_DIR	Number of directors on the board.	11.008	10.000	3.717	5.000	24.000
NUM_MEE	Number of meetings held annually by the compensation committee.	4.264	4.000	2.919	0.000	20.000

End of Table 1

Variable	Description	Mean	Median	Standard deviation	Minimum	Maximum
Ownership and type of control						
OWN_FIV_SHA	The sum of ownership for the top five shareholders, expressed on a per unit basis.	0.454	0.430	0.263	0.010	0.997
FAM_DUM	Binary variable that takes a value of 1 when the main shareholder is an individual or family member and zero otherwise.	0.279	0.000	0.324	0.000	1.000
COR_DUM	Binary variable that takes a value of 1 when the main shareholder is a corporation and zero otherwise.	0.367	0.000	0.476	0.000	1.000
INS_DUM	Binary variable that takes a value of 1 when the main shareholder is an institution and zero otherwise.	0.350	0.000	0.480	0.000	1.000
Firm characteristics						
TOBIN_Q	Approximation of Tobin's Q, calculated as total debt plus market value of equity divided by total assets, in Euros.	2.275	2.392	1.004	0.117	5.951
ROA	Return on assets, calculated as earnings before interest and taxes divided by total assets, expressed on a per unit basis.	0.032	0.035	0.171	-1.879	1.141
STAN_DES	Standard deviation of market return, calculated as the annual volatility of returns.	0.076	0.023	0.560	0.000	11.280
DIVER	Firm business diversification, calculated and the number of different secondary SIC codes.	2.567	2.000	1.930	1.000	10.000
DEBT	Debt ratio, calculated as total debt divided by total assets, in so much per one.	0.535	0.564	0.244	0.004	1.000
SIZE	Firm size, measured as the logarithm of total assets, in Euros.	13.340	13.185	1.878	6.737	18.349

First at firm level, gender diversity was measured by the percentage of women on the board of directors, (PER_WOM_BOA), calculated as the number of women board members divided by the total number of directors. Given the characteristics of our sample, where the minimum and maximum value for the percentage of women directors is at the level of 0% and 44%, the larger values of the variable the larger heterogeneity on the board. Two other variables have been employed to measure diversity at firm level. The Blau diversity index, (BLAU), vary between 0 and 0.5, at which there is the same percentage of male and female board members and thus the diversity is maximised. The Shannon diversity index, (SHANNON), vary between 0 and 0.69, the latter figure cor-

responding to the greatest possible degree of diversity. These two indexes are frequently used as proxies for gender diversity (Stirling 1998; Harrison, Klein 2007).

Second at board level, we measure gender diversity in the role of independent by the percentage of independent women on the board of directors, (PER_IND_WOM), and the presence in the compensation committee by the number of women, (NUM_WOM_MEE).

As control variables related to compensation design we considered three dimensions: board characteristics, ownership structure and firm characteristics. To measure board characteristics, which include the effectiveness and independence of the board of directors, several variables have been employed: (1) size of the board, (NUM_DIR), measured by the number of board members; (2) composition, which considers the proportion of external directors, (PER_EXT_DIR), computed as the external board members divided by the size of the board; and (3) structure, which considers the duality in management through the dummy variable (DUAL), which takes the value 1 when the same person occupies the roles of CEO and chairman of the board and 0 otherwise. We also consider the number of meetings held annually by the compensation committee, as a measure of board effectiveness, (NUM_MEE).

Focusing on the ownership concentration in the hands of a few dominant shareholders we included the stock held by the five largest shareholders, (OWN_FIV_SHA), measured by the percentage of shares owned. We also control the identity of the controlling shareholder with two binary dummies that takes a value of 1 when the main shareholder is an individual/families (FAM_DUM) and when is other company (COR_DUM).

Finally, six variables describing firm characteristics were included which could significantly influence compensation design. These covered matters relating to the size, performance, growth opportunities and leverage of the firm as well as the level of diversification and risk of its business activities. Specifically, these variables were firm size, (SIZE), measured by the logarithm of total corporate assets; firm performance, (ROA), measured by dividing net income by total assets; growth opportunities, (TOBIN_Q), measured by the Tobin's Q, calculated as the market value of equity plus the book value of debt divided by book value of assets; firm leverage, (DEBT), measured as total debt divided by total assets; business diversification, (DIVER), defined as the number of four-digit SIC (Standard Industrial Classification) codes; and firm volatility, (STAN_DES), measured as the annual volatility of returns.

According to the sample characteristics, we have to highlight that the percentage of women on boards of directors is very low, an average of 5.7%. However, there has been a significant change since 2004, the starting year of our sample, when the number of female board members stood at just over 2% moving to almost an 8.2% in 2011.

Regarding independent board members, the percentage of independent female directors is 2.4%. With regard to compensation, only 24.4% is variable, and thus tied to results. It is also noteworthy that more than 79% of board members are external, complying with the Código Unificado de Buen Gobierno (2006) recommendation. Finally, in 58%

of the companies, the position of CEO and chairman of the board are occupied by the same person and 87% of boards comply with the recommendation of the Código Unificado de Buen Gobierno (2006) on the number of board members being between 5 and 15. The percentage of companies with compensation committees increases from 75% in 2004 to 97% in 2011.

We have specified two econometric models for estimation. Equation (1) summarise the first panel data model:

$$\begin{aligned} VAR_PAY_{i,t} = & \alpha + \beta_0 \cdot GENDER_{i,t} + \beta_1 \cdot PER_EXT_DIR_{i,t} + \beta_2 \cdot DUAL_{i,t} + \\ & \beta_3 \cdot NUM_DIR_{i,t} + \beta_4 \cdot NUM_MEE_{i,t} + \beta_5 \cdot OWN_FIV_SHA_{i,t} + \\ & \beta_6 \cdot FAM_DUM_{i,t} + \beta_7 \cdot COR_DUM_{i,t} + \beta_8 \cdot TOBIN_Q_{i,t} + \beta_9 \cdot ROA_{i,t} + \\ & \beta_{10} \cdot STAN_DES_{i,t} + \beta_{11} \cdot DIVER_{i,t} + \beta_{12} \cdot DEBT_{i,t} + \beta_{13} SIZE_{i,t} + \psi_t + \eta_i + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

where ψ_t , η_i and ε_{it} represent the temporal effects by mean of dummy variables, individual effects and the random disturbance, respectively. GENDER represents the percentage of women on the board, the Shannon and Blau diversity indexes. As gender diversity measures show high correlation they have been included in the regressions alternatively. Finally, we include all measures of ownership, board and firm characteristics considered.

Equation (1) allows the estimation of the main effects of gender diversity, similar to Adams and Ferreira (2009), but in a different institutional context. According to Hypothesis 1, we expect that β_0 is positive in Equation (1). To examine the two proposed hypotheses, that is the influence of gender diversity as independent or as compensation committee member as well as obtaining a marginal effect of gender diversity related to ownership concentration, we estimate Equation 2, which includes GENDER which represents the percentage of independent board members and the number of female board members on the compensation committee. According to Hypothesis 2, we expect that β_1 is negative in Equation (2):

$$\begin{aligned} VAR_PAY_{i,t} = & \alpha + (\beta_0 + \beta_1 \cdot OWN_FIV_SHA_{i,t} + \beta_2 \cdot DUM_FAM_{i,t} + \beta_3 \cdot DUM_COR_{i,t}) \\ & GENDER_{i,t} + \beta_4 \cdot PER_EXT_DIR_{i,t} + \beta_5 \cdot DUAL_{i,t} + \beta_6 \cdot NUM_DIR_{i,t} + \\ & \beta_7 \cdot NUM_MEE_{i,t} + \beta_8 \cdot OWN_FIV_SHA_{i,t} + \beta_9 \cdot FAM_DUM_{i,t} + \beta_{10} \cdot COR_DUM_{i,t} \\ & \beta_{11} \cdot TOBIN_Q_{i,t} + \beta_{12} \cdot ROA_{i,t} + \beta_{13} \cdot STAN_DES_{i,t} + \beta_{14} \cdot DIVER_{i,t} + \beta_{15} \cdot DEBT_{i,t} + \\ & \beta_{16} SIZE_{i,t} + \psi_t + \eta_i + \varepsilon_{i,t}. \end{aligned} \quad (2)$$

Equations are estimated using a panel data methodology, applying the System GMM technique (Arellano, Bover 1995; Blundell, Bond 1998). This methodology makes it possible to control, first, for individual heterogeneity, introducing an individual effect, η_i (Himmelberg *et al.* 1999) and, second, for macroeconomic effect on the dependent variable using time dummy variables. In addition, System GMM estimation solves the endogeneity problem with the estimation of a system of two simultaneous equations,

one equation in levels (with lagged first differences instruments) and the other in first differences (with lagged level instruments). We used lagged variables from three years (in levels or first differences, as appropriate) as instruments to control for the persistence over time of the variables relating to the board of directors and ownership.

3. Results

Table 2 shows the effect of gender within the board of directors on the compensation design, independently of the role that the women play in the board. First, we analyse the influence of the female presence on the board on the variable pay of the executive director (Model 1). As predicts Hypothesis 1, the results show a positive and significant effect of the percentage of women on the board of directors on the variable pay of the executive directors. Focusing on economical significance, an increase of 5.7% in the percentage of women on the board of directors implies an estimated increase of 67.8% in the percentage of variable pay.

Table 2. System GMM Estimation of the influence of female directors on the logarithm transformation of fraction of variable based pay

Variable	Model 1	Model 2	Model 3
Constant	-45.418*** (4.1660)	-45.540*** (4.374)	-43.078*** (4.089)
PER_WOM_BOA	13.079*** (2.311)		
BLAU		7.900*** (1.347)	
SHANNON			5.352*** (0.907)
PER_EXT_DIR	-8.433*** (2.263)	-8.000*** (2.601)	-9.170*** (2.107)
DUAL	1.274** (0.536)	1.072* (0.565)	1.266** (0.552)
NUM_DIR	0.329** (0.136)	0.313** (0.130)	0.342*** (0.118)
NUM_MEE	-0.149*** (0.047)	-0.131*** (0.049)	-0.137*** (0.050)
OWN_FIV_SHA	0.018** (0.008)	0.015* (0.008)	0.017* (0.009)
FAM_DUM	3.599*** (0.530)	3.220*** (0.557)	2.934*** (0.634)
COR_DUM	-1.157*** (0.409)	-1.150*** (0.374)	-1.156** (0.459)
TOBIN_Q	5.573 (8.083)	6.506 (8.254)	5.369 (7.718)

End of Table 2

Variable	Model 1	Model 2	Model 3
ROA	0.068*** (0.002)	0.068*** (0.002)	0.071*** (0.004)
STAN_DES	-1.051*** (0.189)	-1.109*** (0.240)	-0.935*** (0.187)
DIVER	-0.249 (0.227)	-0.241 (0.253)	-0.124 (0.237)
DEBT	-0.331 (0.344)	-0.368 (0.341)	-0.316 (0.320)
SIZE	3.112*** (0.332)	3.101*** (0.302)	2.884*** (0.309)
Year dummies	Yes	Yes	Yes
F	1598.58***	1430.81***	1121.12***
z_1	0.000	0.000	0.000
z_2	0.000	0.000	0.000
m_2	-0.70	-0.72	-0.72
Sargan	68.55(307)	69.28(307)	72.27(307)

Notes: *, **, *** Significant at 10%, 5% and 1%, respectively; VARIABLES: PER_WOM_BOA (percentage of women on the board of directors), BLAU (Blau diversity index), SHANNON (Shannon diversity index), PER_EXT_DIR (percentage of external directors on the board), DUAL (binary variable that takes a value of 1 when the same person occupies the roles of CEO and Chairman of the board and 0 otherwise), NUM_DIR (number of directors on the board), NUM_MEE (number of meetings held annually by the compensation committee), OWN_FIV_SHA (the sum of ownership for the top five shareholders), FAM_DUM (binary variable that takes a value of 1 when the main shareholder is an individual/family member and zero otherwise), COR_DUM (binary variable that takes a value of 1 when the main shareholder is a corporation and zero otherwise), TOBIN_Q (approximation of Tobin's Q calculated as total debt plus market value of equity divided by total assets), ROA (return on equity), STAN_DES (standard deviation of market return), DIVER (firm diversification, calculated and the number of different secondary SIC codes). DEBT (debt ratio calculated as total debt divided by total assets), SIZE (firm size, measured as the logarithm of total assets), F statistic (test of combined significance); Hausman (Hausman specification test), z_1 and z_2 are two Wald tests of the joint significance of the reported coefficients and the joint significance of the time dummy variables, respectively (asymptotically distributed as λ^2 under the null hypothesis of no relationship, probability is shown); m_2 is a second-order serial correlation test using residuals in first differences, asymptotically distributed as $N(0,1)$ under the null hypothesis of no serial correlation; Sargan is a test of the over-identifying restrictions, asymptotically distributed as λ^2 under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Models 2 and 3 include the Shannon and Blau diversity indexes. As discussed above, these variables show their maximum value when there are equal numbers of men and women on the board. The figures obtained confirm the positive effect of gender diversity on the variable pay. An increase of 0.095 in the Blau diversity index, which is equal to its mean value, implies an estimated increase of 67.9% of the percentage of variable pay and an increase of 0.159 in the Shannon diversity index, which is equal to its mean value, implies an estimated increase of 70.1% in the percentage of variable pay.

Therefore the diversity of gender in the board leads to a more appropriate compensation design, with a greater percentage of the compensation linked to firm results as predicts Hypothesis 1. Similar results were previously obtained by Adams and Ferreira, but in a different institutional context. This may reduce agency conflicts, as Adams and Ferreira (2009) and Bear *et al.* (2010) argue. These results based on three different measures of gender diversity allow accept Hypothesis 1, that is, gender diversity in the compensation of the board of directors leads to a greater proportion of executive directors' compensation linked to performance.

In Table 3, we examine Hypothesis 1 considering the presence of women in the role of independent and Hypothesis 2 where we test the moderating role of the ownership concentration. In Models 1 and 2 we present the results obtained when considering the role of female board members through the percentage of female independent directors on the board and the number of female board members on the compensation committee, respectively. Furthermore, Models 3 and 4 takes into account ownership concentration interactively to test Hypothesis 2. As can be seen in Model 1, there is a positive and highly significant effect of the percentage of female independent directors and this coefficient is larger than the coefficient of the effect of the percentage of female directors obtained in Table 2. Focusing on economical significance, an increase of 2.4% in the percentage of independent women implies an estimated increase of 60.3% in the percentage of executive directors' variable pay. Therefore, the independent female presence on the board not only increases the amount of variable pay received by executive directors reducing, at the same time, the amount of fixed pay. It supports the conclusion that their role on the board conditions their supervisory activities. We accept Hypothesis 1 when we consider the presence of women in the role of independents.

Also, the number of female board members on the compensation committee is positive and significant (Model 2). In this case, an increase of 0.24 in the number of female board members on the compensation committee implies an estimated increase of 55.8% in the percentage of executive directors' variable pay. Thus, the presence of women promotes the diversity of approaches and increases the effectiveness of the compensation committee. Based on this argument, the female board members may exercise greater supervisory activities through compensation committee meetings and the compensation design is discussed and studied from different perspectives. This evidence supports previous findings on the role of heterogeneous groups in reducing agency costs and establishing a fair compensation system. Thus, the incorporation of women onto boards not only promotes gender equality, but increases the effectiveness of this mechanism by creating diversity in the decision-making process.

Models 3 and 4 report estimations of Equation 2, considering the differing impact of the percentage of independent female directors and the number of female board members, and linking this with ownership concentration. As predicts Hypothesis 2, the results show a significant negative effect on the executive directors' variable pay of the product of the percentage of independent female board members and ownership concentration (Model 3). The same result is obtained for the product of the number of female board members on the compensation committee and ownership concentration (Model 4).

Table 3. System GMM Estimation of the influence of female directors on the logarithm transformation of fraction of variable based pay

Variable	Model 1	Model 2	Model 3	Model 4
Constant	-44.203*** (3.759)	-45.375*** (4.519)	-48.245*** (4.678)	-46.460*** (3.392)
PER_IND_WOM	17.387*** (3.991)		26.655** (11.007)	
PER_IND_WOM* OWN_FIV_SHA			-0.458* (0.239)	
PER_IND_WOM* FAM_DUM			-62.522*** (16.276)	
PER_IND_WOM* COR_DUM			16.133*** (5.733)	
NUM_WOM_MEE		0.999** (0.412)		3.367*** (0.762)
NUM_WOM_MEE* OWN_FIV_SHA				-0.049*** (0.013)
NUM_WOM_MEE * FAM_DUM				-10.265*** (1.244)
NUM_WOM_MEE * COR_DUM				-0.250 (0.648)
PER_EXT_DIR	-10.957*** (2.076)	-5.898*** (1.829)	-8.067*** (1.974)	-8.059*** (2.530)
DUAL	1.243** (0.517)	0.476 (0.516)	0.338 (0.601)	2.238*** (0.560)
NUM_DIR	0.625*** (0.141)	0.386*** (0.125)	0.665** (0.123)	0.283** (0.108)
NUM_MEE	-0.227*** (0.044)	-0.144*** (0.052)	-0.214*** (0.066)	-0.233*** (0.057)
OWN_FIV_SHA	0.025** (0.012)	0.032*** (0.010)	0.002 (0.013)	0.065*** (0.013)
FAM_DUM	4.156*** (0.549)	2.446*** (0.760)	5.063*** (0.770)	7.502*** (0.849)
COR_DUM	-2.294*** (0.454)	-1.035* (0.571)	-1.746*** (0.573)	-1.519*** (0.372)
TOBIN_Q	21.495** (8.438)	-2.234 (9.025)	16.888** (7.509)	3.410 (9.499)
ROA	0.070** (0.004)	0.057*** (0.005)	0.091*** (0.004)	0.082*** (0.004)
STAN_DES	-1.258*** (0.256)	-1.108*** (0.188)	-1.348*** (0.371)	-0.571* (0.309)
DIVER	-0.390* (0.210)	0.275 (0.282)	-0.153 (0.259)	-0.486 (0.409)

End of Table 3

Variable	Model 1	Model 2	Model 3	Model 4
DEBT	-0.997*** (0.354)	0.028 (0.373)	-0.784** (0.314)	-0.242 (0.392)
SIZE	2.923*** (0.288)	2.931*** (0.309)	3.004*** (0.389)	3.119*** (0.360)
Year dummies	Yes	Yes	Yes	Yes
F	1601.85***	422.35***	2145.31***	1010.51***
z_1	0.000	0.000	0.000	0.000
z_2	0.000	0.000	0.000	0.000
m_2	-0.79	-0.94	-1.00	-0.76
Sargan	74.60 (307)	68.25(307)	63.15(317)	62.89(304)

Notes: *, **, *** Significant at 10%, 5% and 1%, respectively; Chi2: test of combined significance; VARIABLES: PER_IND_WOM (percentage of female independent board members), OWN_FIV_SHA (the sum of ownership for the top five shareholders), NUM_WOM_MEE (number of female board members on the compensation committee), PER_EXT_DIR (percentage of external directors on the board), DUAL (binary variable that takes a value of 1 when the same person occupies the roles of CEO and Chairman of the board and 0 otherwise), NUM_DIR (number of directors on the board), NUM_MEE (number of meetings held annually by the compensation committee), FAM_DUM (binary variable that takes a value of 1 when the main shareholder is an individual/family member and zero otherwise), COR_DUM (binary variable that takes a value of 1 when the main shareholder is a corporation and zero otherwise), TOBIN_Q (approximation of Tobin's Q calculated as total debt plus market value of equity divided by total assets), ROA (return on equity), STAN_DES (standard deviation of market return), DIVER (firm diversification, calculated and the number of different secondary SIC codes). DEBT (debt ratio calculated as total debt divided by total assets), SIZE (firm size, measured as the logarithm of total assets), F statistic (test of combined significance); Hausman (Hausman specification test), z_1 and z_2 are two Wald tests of the joint significance of the reported coefficients and the joint significance of the time dummy variables, respectively (asymptotically distributed as λ^2 under the null hypothesis of no relationship, probability is shown); m_2 is a second-order serial correlation test using residuals in first differences, asymptotically distributed as $N(0,1)$ under the null hypothesis of no serial correlation; Sargan is a test of the over-identifying restrictions, asymptotically distributed as λ^2 under the null hypothesis of no correlation between the instruments and the error term, degrees of freedom in parentheses.

The economical significance is smaller when ownership concentration increases. In companies with a mean ownership concentration, an increase of 2.4% in the percentage of independent women implies an estimated increase of 30.1% in the percentage of executive directors' variable pay and an increase of 0.24 in the number of female board members on the compensation committee implies an estimated increase of 43.6% in the percentage of variable pay.

The evidence obtained of a negative marginal effect implies that a proper compensation system, encouraged by the presence of females on the board as independent members or on the compensation committee, is reduced by the existence of a few dominant shareholders. As expected, ownership concentration reduces the positive relationship between the presence of the woman and executive directors' compensation linked to firm performance (Hypothesis 2). Also when the main shareholder is an individual/fam-

ily the positive relationship is smaller as a consequence of ineffective internal controls while if the main shareholder is a company the relationship is larger as a consequence of internal control quality. Therefore, we accept Hypothesis 2 which states that ownership concentration reduce the positive links between independent women on the board and executive directors' compensation linked to firm performance.

Conclusions and discussion

This paper starts from the premise that one of the ways in which boards of directors can have a positive influence in business is through the increasing of the presence of independent women directors. Board diversity can have a significant impact on the improvement of executive monitoring by way of the design of an appropriate compensation system linked to performance, which orients their decision-making towards maximising the value of the firm. Additionally, this paper add new evidences in the field by considering a particular context of corporate governance, the Spanish one, where the role of executive directors is most relevant in comparison with the Anglo-Saxon context as a consequence of the high level of ownership concentration in a few majority shareholders who usually act as a executives as well.

Using panel data methodology for all the companies listed on the Spanish stock market during the period 2004–2011, we find a positive and significant influence in the relation among gender diversity on the board, effectiveness of monitoring, and pay-for-performance. Specifically, the results show a positive and highly significant effect of the percentage of female independent directors on the proportion of executive directors' variable pay. Our findings also show that the number of female board members on the compensation committee influences the variable pay positively. The greater variety of skills, knowledge, and attitudes which with women contribute to improve the boards' decision making also drive to better information about and evaluation of executives favouring the establishment of pay packages more closely linked to firm performance. These characteristics of women, influencing gender diversity in terms of independent women on the board, may compensate the low monitoring effectiveness of Spanish boards.

Additionally, our findings contribute to highlight the moderating role of ownership structure in the relationships between board diversity and executive directors' compensation. Although previous empirical evidence generally supports that when ownership is concentrated executives are better monitored and the compensation they received is more closely linked to company performance, this expected effect may change depending on the context of corporate governance. In Spanish listed companies we can find many companies controlled by majority internal shareholders (firms, individuals, and/or families), who combine the roles of executives with that of directors on the board. The controlling shareholder serves as "entrenched" executive, with sufficient ownership to control the board. In this framework, the presence of independent women directors on the board balance the low monitoring effectiveness of firms controlled by internal majority shareholders.

In that vein, our results show a significant and negative effect on the executive directors' variable pay of interaction between the proportion of independent female directors on

the board and ownership concentration – obtaining the same result for the number of female board members on the compensation committee. The evidence obtained implies that a proper executives' compensation system, encouraged by the presence of females on the board as independent members or on the compensation committee, is reduced by the existence of a few dominant shareholders. As we expected, the high level of ownership concentration in Spanish listed firms that reduces the effectiveness of corporate governance, also diminishes the positive relationship between the presence of women and executive directors' compensation linked to firm performance.

Hence, we can interpret these results in the Spanish context, as evidence of the possible existence of a certain underestimation of women's skills as well as discrimination based on the stereotypes and social and institutional prejudices on boards of companies mostly dominated by majority internal shareholders, most of them men. In spite of all the measures taken to promote gender equality in large Spanish firms, the data show that there is still much to be done. While it is true that the percentage of female directors has risen from 2% in the year 2004 to 9% in 2009, the percentage achieved is still a long way from the objective of 40% established by the Spanish Government for the year 2015. Furthermore, the abovementioned law does not apply to small and medium-sized firms which representing the majority of the Spanish businesses and employment. The majority of previous studies and this present one indicate that gender equality is advisable not only from the point of view of social justice but also in economic terms. Thus the implementation of legislation on equality and the broadening of its application to the firms to which it currently does not apply is advisable.

Therefore, the implications of this study go in the direction of the reform of the composition of boards, and the introduction of gender diversity could be the first step towards the improved control and effectiveness of companies. Firstly, diversity could help to establish compensation packages more related to firm performance, which would reduce agency costs and promote a better image for the management of the firm, its effectiveness and functioning. Secondly, firms should not only take into account that gender diversity helps to make them socially responsible, with a view to complying with equality legislation and to improving their corporate image, but that increasing diversity on boards can also help them take better corporate decisions, with a resulting increase in firm value. Similarly, if, for whatever reason, a board lacks the characteristics which would promote greater monitoring and effectiveness, the existence of diversity could substitute for them in this absence.

Finally, with regard to the limitations, one of the major ones was related to the lack of detailed information of firms' corporate governance reports concerning executives' compensation. It would be interesting to carry out additional studies considering the whole top management team, distinguishing between directors and non-director executives. Additionally, a similar analysis that took into account whether gender diversity among different types of firm's owners has a significant effect on executives' compensation would be interesting in future studies. Lastly, it is necessary to look deeply insight into the factors influencing the presence of women on the board considering additional views from social and psychological traditions.

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