BOARD GENDER DIVERSITY CODES, QUOTAS, AND THREATS OF SUPRANATIONAL LEGISLATION: IMPACT ON DIRECTOR CHARACTERISTICS AND CORPORATE OUTCOMES

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ABSTRACT

We explore how a code, soft quota, and a proposal for supranational law for board gender diversity affects women directors' human capital characteristics and corporate outcomes with an unbalanced panel of 116 non-financial firms and 1,321 firm-year observations from 2003-2016 in Spain. Consistent with resource dependence theory, after a non-punitive law is passed, boards seek to appoint more female directors who possess human capital attributes that will reduce uncertainty and bring necessary resources to firms. Compared with their pre-law counterparts, the new female directors tend to have more human capital in terms of executive experience in non-listed firms, and some non-executive backgrounds, education, and international experience; however, these new women directors generally possess less human capital than their male counterparts. Upper echelons theory suggests that board directors can meaningfully impact corporate outcomes. Overall, our results contradict upper echelons predictions about the impact of a regulation-driven increase of women directors on corporate outcomes. Indeed, we find a lack impact of the increase of women's presence on boards on corporate outcomes. Regarding policy, our findings substantially differ from those reported for countries with "hard law" board gender quotas.

1. Introduction

Men hold the majority of the world's board directorships, stimulating considerable political and academic debate on how to improve gender equality on corporate boards. Soft measures such as "comply or explain" provisions in corporate governance codes (Gómez-Ansón, 2012; Terjesen, Aguilera, and Lorenz, 2015) were enacted in Denmark, Greece, Ireland, Luxemburg, Poland, Romania, Sweden, Slovenia, and UK (ECGI, 2021). "Hard" quotas have sanctions for non-compliance, such as in Norway (i.e., de-listing), Belgium (i.e., invalidate appointments to any vacancies and suspend director compensation), or France (i.e., nullify board elections and suspend director compensation). A third option are sanction-free (i.e., "soft") quotas for listed firms as in Iceland, India, Israel, Malaysia, Netherlands, Spain, and Switzerland. Quotas can also apply only to state-owned companies as in Denmark, Finland, Greece, Ireland, Kenya, Poland, and Slovenia (Kirsch, 2018). At a supranational level, the European Commission proposed a Directive to increase women's representation on boards in 2012.

Building on an established field of research examining linkages between the presence of female directors and corporate outcomes (e.g., Haslam et al., 2010; Gregory et al., 2013, for a meta-analysis, see Post and Byron, 2015), a growing literature analyses the consequences of hard quota regulations on directors' characteristics and company outcomes (e.g., for Norway and Italy: Ahern and Dittmar, 2012; Bertrand et al., 2014; Ferrari et al., 2017). Despite the prevalence of "comply or explain" gender diversity provisions in corporate governance codes, there is scant attention to implications and outcomes (Willey, 2017). The growing research stream on soft quotas highlights small increases in female directors in Spain (Gabaldón and Giménez, 2017; de Cabo et al., 2019; Palá-Laguna and Esteban-Salvador, 2016), Malaysia (Shan, Razak, and Ali, 2018), and India (Srivastava, Das, and Pattanayak, 2018), but does not consider implications for directors' characteristics and

firm outcomes. Although frequently cited as successful in "voluntarily" increasing women's board presence (Armstrong and Walby, 2012), research on potential quotas such as the EU directive is limited— Swedish boards increased their shares of female directors after the threat of regulation (Hinnerich and Jansson, 2017)— but we lack a full understanding of potential legislation's implications. Our research answers calls to explore the impact of regulations on board outcomes (Hillman, Cannella, Paetzold, 2000; Withers, Hillman, and Cannella, 2012; de Cabo et al., 2019).

We build and test resource dependence and upper echelons theories to explore how "comply or explain" codes, soft quotas, and the threat of supranational legislation affect women directors' human capital attributes and firm outcomes[i]. Resource dependence theory suggests that companies facing board gender diversity legislation, in order to adhere to norms and regulations, will appoint new female directors who possess prior experience and linkages to key resources needed to reduce firm uncertainty, and reflect the supply of female talent. Upper echelons theory describes how a firm's leaders, including directors, meaningfully shape firm outcomes. Spain is an ideal context as the second European country to establish gender diversity recommendations in codes in 2006 and the first to introduce a soft quota in 2007 for listed firms. As an EU member state, Spain was also affected by the proposed European quota in 2012. We assemble 1,321 year-firm observations of Spanish non-financial companies during a 14-year period in which Spain enacted a code, a soft quota, and faced an EU-wide proposal.

Our research offers contributions to theory, practice, and policy. First, and consistent with resource dependence theory, new women directors are more likely to possess higher experience from politics, consultancy, and as senior managers in non-listed firms, educational qualifications, and international backgrounds, when compared to their pre-legislation female counterparts; however, new female directors' human capital is still lower relative to male

directors. Second, in contrast to upper echelons theorizing, we do not find evidence that the post-regulation increase in women directors significantly influences firm outcomes, contrary to hard quota institutional context research. Our findings may explain the non-significant impact of non-punitive initiatives on corporate outcomes. For practice and policy, our longitudinal study indicates that implications for codes and soft quotas significantly differ from hard quotas.

2. Context: Spain

2.1. Spanish boards of directors

Spain's one-tier corporate governance system requires a unified board performing both management and supervisory functions, with at least three directors. Although Spanish law does not set an upper limit, the Code of Good Governance recommends a maximum 15 directors. Spanish directors are classified as non-executive (i.e., either purely external/ independent or proprietary in representing large shareholders due to a legal system mandate for proportional shareholder representation) or executive. Listed firms must file an annual corporate governance reports on composition, rules of organisation, board functioning and committees, and compliance with the Code (Mateu de Ros and Vidal, 2019). External directors comprise 85 percent of Spanish listed firm boards (CNMV, 2020).

A country's institutional context partly explains gender diversity on boards (Terjesen and Singh, 2008; Grosvold, Rayton, and Brammer, 2016). Although women's roles in society changed significantly since the return of democracy in Spain (Bustelo, 2016), four decades of Franco's military dictatorship reinforced the male breadwinner model in Spanish society (Campbell and Mínguez-Vera, 2010). Women comprise more than half of university graduates in Spain since the 1990s, and account for almost 60 percent in 2017 (Instituto de la Mujer, 2021), but remain underrepresented in top management and boards. Spain ranks 14 of 17 European countries in gender diversity and second lowest among 12 countries in European

Women on Boards (2019)'s Gender Diversity Index. Spain's share of women directors (22 percent) is lower than the OECD (2020) average (22.3 percent). Women are underrepresented in the Supreme Court (14.1 percent) and professorships (22.5 percent), but not politics: women comprise 44 percent of parliament and 46.7 percent of ministries (Instituto de la Mujer, 2021).

2.2. Codes and quotas around the world and in Spain

Governments seek to increase women's underrepresentation in corporate boardrooms through a corporate governance code with targeted recommendations and regulations or a quota stating that a certain percentage of directors' representation must be allocated to the underrepresented group. Norway established the first mandatory quota stipulating at least 40% representation from each gender or de-listing from the Oslo Stock Exchange. Subsequently, ten European countries enacted quotas: Spain (2007; 40%; sanction-free), Iceland (2010; 40%; sanction-free), France (2011; 40%; suspension of directors' compensation and nullification of board elections), Belgium (2011; 33%; appointments to vacant positions that do not conform to the quota are invalidated and directors' compensation suspended), Italy (2011; 33%; fines and directors lose office), Netherlands (2011; 30%; sanction-free), Germany (2015; 30%; empty board seats and/or administrative fines); Austria (2017; 30%; nullification of appointment); Portugal (2017; 33.3%; non-compliance declaration by the Portuguese Securities Market Authority qualifies appointment as only provisional); and Switzerland (2019; 20% executive board and 30% supervisory board; sanction-free).

Spanish listed firms face a code, soft quota, and threat of a supranational hard quota, as summarized in Table 1. The 2006 Spanish Unified Good Governance Code recommends that large publicly traded firms' annual corporate governance reports include detailed information on gender distribution. The Code's rationale is grounded in political, social, and

business case arguments, and refers to the low female representation as a sub-optimal resource utilization. The Code suggests that men's domination is self-perpetuating such that increasing women's board representation can only be achieved with a direct effort, and that recommendations will improve firm performance (Palá-Laguna and Esteban-Salvador, 2016). One year later, in 2007, the Spanish Equality Law (Section 75) made Spain was the first EU and the second European country to establish a 40% gender quota for large firms. The quota's preamble describes a rationale grounded in political and social justice (Gonzalez-Menendez and Martínez-Gonzalez, 2012; de Cabo et al., 2019). Spanish Socialist Workers' Party defended the law on the grounds of justice and equality. The conservative People's Party's opposition was based on limits to business freedom and principles of merit (Lombardo and Verge, 2017). The two leading business organizations, Spanish Confederation of Business Organizations and Spanish Confederation of Small and Medium Enterprises, advanced arguments based on anti-meritocracy and a limited supply of qualified females (Lombardo and Verge, 2017). Most Spanish women directors opposed quotas as they expected their qualifications would be questioned (Gonzalez-Menendez and Martínez-Gonzalez, 2012). The business community's strong opposition may explain the lack of non-compliance sanctions (de Cabo et al., 2019).

Spain was also affected by the EU Directive of November 2012 that proposed a minimum 40% share of each gender for non-executive directorships in listed companies by January 1, 2020, and by January 1, 2018, for state-owned companies. The proposal was backed by the European Parliament on November 20, 2013. Due to some member states' opposition, no agreement has been reached so far (European Parliament, 2021).

- Insert Table 1-

2.3. Empirical evidence on legislation around the world and in Spain

Appendix Tables 1 and 2 summarize existing research on board gender diversity regulation. Appendix Table 1 Panel A explores the effect on board composition and firm outcomes of hard quotas; Panel B summarizes research implications from codes, soft quotas, and a threat of hard quotas. Among the findings, there is no significant increase in the share of women directors after the 2014 Canadian code (Willey, 2017). While researchers investigate the influence of board gender diversity on firm performance for listed firms in India (Srivastava et al., 2018), Malaysia (Shan et al., 2018), and Spain (Reguera-Alvarado, Fuentes, and Laffarga, 2017), these studies do not account for the potential impact of quotas and codes. In Sweden, the share of female directors increased after the threat of regulation and gender diversity positively relates to performance (Hinnerich and Jansson, 2017). Appendix Table 1 Panel C indicates that there is no research on supranational legislation implications. A few studies analyse the impact of quotas in Norway and Italy on female directors' profiles (Ahern and Dittmar, 2012; Bertrand et al., 2014; Ferrari et al., 2017). Appendix Table 2's Spanish board gender diversity research review indicates some findings that Spanish firms do not substantially increase the share of women directors after a soft quota (Gabaldón and Giménez, 2017; Palá-Laguna and Esteban-Salvador, 2016; de Cabo et al. 2019); while Reguera-Alvarado et al. (2017) show diversity increases after the Spanish code and soft quota. No study analyses the implications of Spain's initiatives on female directors' profiles.

3. Theoretical background and hypotheses

3.1. Resource dependence theory and board composition

Resource dependence theory suggests that boards are "vehicles for co-opting important external organizations" (Pfeffer and Salancik, 1978, p. 167), and managing external dependencies (Pfeffer, 1972; Hillman, Withers, and Collins, 2009). A board's composition will reflect the firm's external dependencies, and will experience strategic changes when a

firm's environment changes significantly. New laws constitute environmental changes that are expected to impact board structures to better align the board with the new dependencies, as Hillman et al. (2000) illustrate with airline industry deregulation. Firms facing new board structure legislation might reasonably expect additional government regulations that could potentially upend the firm's competitive dynamics.

We expect that board gender diversity legislation will also result in board structure changes, specifically in differences in directors' profiles before and after legislation. Resource dependence theory highlights four paths by which directors' prior experience and environmental linkages improve board functioning: access to key resources, particularly knowledge and advice in strategic areas; communication channels between external organizations and the firm; ability to retain commitments and support from the environment; and legitimacy (Pfeffer and Salancik, 1978). Prior research highlights boards' needs for directors who can be classified in four categories: insiders, business experts, support specialists (lawyers, bankers, insurance companies' representatives, public relations experts), and community influentials (political leaders, university faculty, clergy, leaders of social or community organizations), and the need for each category depends on the environment (Hillman et al., 2000). We expect that the new board gender diversity legislation will further increase firms' desire to acquire resources, communication channels, commitments, and legitimacy from insiders, business experts, support specialists, and community influentials.

Prior research highlights previous executive experience as a strong signal of director competence, and the preference for CEOs (especially of successful firms), prior/current directorships in other firms, and general and industry backgrounds (Withers et al. 2012). For example, following hard quota regulations, there is significant demand for new women directors with executive experience, often exceeding the supply (Ahern and Dittmar, 2012; Gregorič and Hansen, 2017). Boards are more likely to seek directors with executive

experience who are expected to provide the necessary access to key resources such as knowledge to navigate decisions concerning business unit and corporate level competition and strategic directions, as well as potential mergers, acquisitions, or joint ventures. These insider and business expert directors provide interlocks to other corporations, especially as suppliers or customers. Boards also seek new female directors with prior corporate experience that enables regular communication with a variety of external corporate entities, thereby reducing the firm's transaction costs. Firms will seek new female directors whose executive experience enables them to acquire commitments and support from external dependencies, and make informed decisions. Taken together, we expect that the post-regulation demand for women directors with executive experience will increase as boards seek legitimacy:

> *Hypothesis 1a: Following the enactment of a code, soft quota, or proposal of supranational law, newly appointed women directors will have more executive experience than their pre-regulation women counterparts.*

Resource dependence theory (Pfeffer, 1972; Pfeffer and Salancik, 1978) suggests that boards seek individuals with experience beyond the executive suite, such as non-business professional experience from public sector, professorships, consulting, and/or politics. Public sector knowledge and skills are particularly valuable for firms that require greater knowledge about government agencies or public procurement process. As a board gender diversity legislation is one form of government control over corporate decisions, a firm might naturally expect further government regulations, and want to possess timely knowledge about expected regulations to prepare responses. Firms will seek directors with special knowledge in acquiring and processing information about competition, for example through consulting or academic research. Directors' prior roles as politicians, civil servants, professors, or consultants often lead to well-established communication channels with these entities

(Hillman et al., 2000), including new expected government regulations, university research, and industry trends. New female directors with elected, appointed, or career government experience can also convey status and legitimacy from their roles shaping policy and serving a variety of stakeholders. The demand for these community influential and support specialists' non-business skills meets supply as women are more likely to have public sector (OECD, 2014) and less likely to have corporate experience (Hillman, Cannella, and Harris, 2002), leading us to propose:

> *Hypothesis 1b: Following the enactment of a code, soft quota, or proposal of supranational law, newly appointed women directors will have more non-business professional experience than their pre-regulation women counterparts.*

A third critical set of director human capital encapsulates educational attainment and international experience, both in educational and work experience. Following gender diversity regulation, a firm will seek directors who can provide deep-level expert knowledge and advice in strategic areas. Director candidates with greater levels of education and international experience would be expected to possess excellent communication skills, both oral and written, and in different country contexts, perhaps even in a foreign language. Firms naturally seek directors who are in the best position to obtain further commitments and support, for example in a new business area or a foreign market. Resource dependence theory also suggests that the legitimacy from higher levels of education, particularly a PhD and international experience in both studies and work, will be particularly desired post-regulation. This demand is met by supply of community influential and support specialists as women have higher levels of education (European Commission, 2018) than men, and increasingly pursue international careers (GBV, 2018), and international education experiences (InterNations, 2020), such as EU Erasmus Student Mobility (European Commission, 2015). Taken together, we propose:

Hypothesis 1c: Following the enactment of a code, soft quota, or proposal of supranational law, newly appointed women directors will have more educational attainment and international experience than their pre-regulation women counterparts.

3.2. Upper echelons theory and corporate outcomes

Upper echelons theory (Hambrick and Mason, 1984) explores how top managers' and directors' characteristics, such as knowledge, motives, attitudes, and cognitive patterns determine firms' strategic choices and performance. Female directors' unique knowledge, experience, and values bring distinct cognitive frames (Post and Byron, 2015), leading to differences in board processes, decision-making, and firm outcomes. In comparison to men, women in the upper echelons tend to have non-business backgrounds and high levels of education (Carter et al., 2010; Singh, Terjesen, and Vinnicombe, 2008), foreign citizenship (Singh et al., 2008), strengths in marketing and sales (Groysberg and Bell, 2013), and more diverse non-work interests, including higher interest in philanthropy and community service (Groysberg and Bell, 2013). Women's cognitive frames are likely to impact firm decision processes: women directors are more likely to attend meetings (Adams and Ferreira, 2009) and to be more open to risk taking in comparison to their male counterparts (Adams and Funk, 2012). Gender diverse boards engage in more discussions and integrate disparate knowledge and information (Van Ginkel and Van Knippenberg, 2008; Post and Byron, 2015) and favour cooperative decision-making (Bart and McQueen, 2013). Female directors' higher value of interdependence, benevolence, and tolerance (Adams and Funk, 2012) may stimulate intra-board collaboration (Post and Byron, 2015). Empirical evidence shows that women's presence improves board decision making (Carter et al., 2010), international diversification (Herrmann and Datta, 2005), corporate social performance (Manner, 2010), and firm performance (Carter, Simkins, and Simpson, 2003). A recent meta-analysis reports that firms

with more female directors generally have higher accounting returns, but not better market performance (Post and Byron, 2015). Context factors (see Post and Byron, 2015) could help explain these results.

Any examination of the impact of board gender diversity on firm outcomes following regulation must consider the attributes of gender diversity initiatives. Although cognitive frames brought by newly appointed women may positively impact firm outcomes, the regulation-driven rapid demand for female directors, especially punitive legislation, may lead to a short supply of women with senior management experience. Labelle, Francouer, and Lakhal (2015) find a positive effect of board gender diversity on firm performance in contexts without regulation, and a negative influence in contexts with regulation. Empirical evidence from hard quotas rejects the business case (Appendix Table 1 Panel A) as Norway's quota generates inefficient organization forms and/or boards (Bøhren and Staubo (2014), increases labour cost and employment levels and reduces short-term profits (Matsa and Miller, 2013), negatively impacts stock prices and firm performance (Ahern and Dittmar, 2012; Bøhren and Staubo, 2015), or negligibly affects firm value (Dale-Olsen, Schøne, and Verner, 2013; Eckbo, Nygaard, and Thorburn, 2016).

The impact of soft-quotas, codes, or threats of regulation on firm outcomes may differ from hard quotas. As these regulations are sanction free, voluntary, or just constitute a threat, firms are not obligated to fill directorships with women in a short time period, and thus the negative impacts associated with a large shortage of executive experience will not be as profound. In this situation, upper echelons theory suggests a positive impact on firm outcomes due to increased board gender diversity associated with a soft quota, code, and threat of legislation. Spanish research findings are mixed: some report board gender diversity increased after legislation, and positively influences firm value (Reguera-Alvarado et al., 2017); others do not find any influence (Comi et al., 2020). For threats of legislation, in

Sweden the increase in female representation on boards was accompanied by improved firm performance (Hinnerich and Jansson, 2017). Based on the above, we expect:

> *Hypothesis 2: Following the enactment of a code, soft quota, or proposal of supranational law, greater gender diversity will improve firm performance outcomes.*

4. Research design

4.1. Sample

The initial sample is the entire population of Spanish Stock Exchange-traded firms from 2003 to 2016. We exclude finance, banking, and insurance firms due to different regulatory and governance characteristics (Stoney and Winstanley, 2001), as well as subsidiary firms (90 percent or greater ownership by another listed firm)[ii], firms that lack information for at least four consecutive years, and merged firms. The final sample is an unbalanced panel of 116 non-financial firms and 1,321 firm-year observations. We manually collected corporate governance data from annual reports filed with the Spanish Supervisory Agency (CNMV), and financial data from Sociedad de Análisis de Balances Ibéricos (SABI), Madrid Stock Exchange, CNMV, Thompson Reuters Eikon, and Datastream. Board directors' data come from annual reports and official websites. When the data is unavailable, we request board directors' CVs, and if non-response, then attempt to identify missing variables with BoardEx.

4.2. Variables

Table 2 shows firm (Panel A) and director (Panel B) variables. *Percentage of women directors* captures women's presence on boards and Δ *Percentage of women directors > 0* and Δ *Percentage of women directors* captures the increase of women's presence on boards. The Spanish code approval in 2006, Spanish Equality Act passage in 2007, and proposed European Commission Directive of 2012 are estimated with two dummies: *Code and soft quota* (=0 before 2007 and =1 after 2007) and *EU Directive proposal* (=0 before 2012 and =1

after 2012). Gender diversity on board and regulation variables capture women's upper echelons presence.

- Insert Table 2 -

Firm outcomes are measured with industry-adjusted firm *Market-to-book ratio* and *Earnings management* (following Jones, 1991). Prior research on governance, outcomes[iii]. and women's board presence[iv] suggests ten controls: number of directors (*Board size*), percentage of *Independent directors* and *Proprietary directors*, average number of months since appointment (*Board tenure*), CEO Chair *Duality*, *Family firm* if a family or individual holds more than 10 percent of voting rights, *Age*, *Assets* (*ln*), *Leverage* ratio, and *Regulated industry*.

Director-level variables relate to gender (*Female*), appointment date (*Appointed after code and soft quota* and *Appointed after EU Directive proposal*), and human capital. Professional experience variables capture four directors' expertise profiles predicted by resource dependence theory: insiders and business experts (*Senior manager in listed firms*, *Senior manager in non-listed firms*, *CEO in listed firms*, *CEO in non-listed companies*, *Chair in listed firms*, and *Chair in non-listed firms*), community influentials (*Professor*, *Politician*, and *Civil servant*), and support specialists (*Consultant*). Educational attainment captures at least a *Bachelor's degree*, *Post-baccalaureate degree*, or *PhD*. International experience accounts for at least an undergraduate degree abroad (*International studies*) or work experience (*International labour experience).* Educational attainment and international experience are proxies for knowledge and intellect that are linked to community influentials and support specialist directors' profiles. Taken together, these human capital variables reflect theory and previous research[v].

4.3. Methodology

We first explore statistical differences in directors' human capital characteristics by gender and board appointment date. Second, a multivariate factorial analysis of directors' human capital attributes before and after the enactment (or threat) of initiatives identifies the most common training and experience profiles. We use profit models to test Hypotheses 1a, 1b, and 1c concerning how women directors' professional, educational, and international backgrounds are affected by the approval (or threat) of non-punitive initiatives: $E\left[Directors'\ human\ capital\ characteristics_{it}^{*}\ \middle|X_{it}, Z_{jt}, Z_{jt-1,}\right] = \alpha_0 + \beta_1 X_{it} + \beta_2 Z_{it} + \beta_3 Z_{jt-1} + \sum_{t=2003}^{2016} A_t + \varepsilon_i$ where $Directors'\ human\ capital\ characteristics_i$ is a vector of dummy variables reflecting if female (and male) director i has certain human capital (*Senior manager in listed firm*, *Senior manager in non-listed firms*, *CEO in listed firms*, *CEO in non-listed firms*, *Chair in listed firms*, *Chair in non-listed firms*, *Professor*, *Politician*, *Civil servant*, *Consultant*, *Bachelor's degree*, *Post-baccalaureate degree*, *PhD*, *International studies*, and *International labour experience*), X_i denotes explanatory variables (*Female*, *Appointed after code and soft quota* and *Appointed after EU Directive proposal*), Z_{jt} and Z_{jt-1} represent firm j controls (*Independent directors*, *Proprietary directors*, *Board size*, *Board tenure*, *Duality*, *Family firm*, *Age*, *Assets*, *Leverage*, and *Regulated industry*), $\sum_{t=2003}^{2016} A_t$ is a set of time dummy variables, and ε_i represents the random error term. To control for endogenity, we lag one period for all controls except *Age* and *Regulated industry*.To control for unobservable heterogeneity, standard errors are clustered at firm level.

To test the impact of the enactment (or threat of) of board gender diversity laws on firm outcomes (Hypothesis 2), we apply the panel data Generalized Method of Moments (Arellano and Bond, 1991). The two-step difference GMM model is: $Outcome_{\ it} = \beta_1 X_{it} + \beta_2 Z_{it} + \sum_{t=2003}^{2016} A_t + \varepsilon_{it}$ where $Outcome_{it}$ is a set of continuous variables (*Market-to-book ratio* and *Earnings management*) of firm i in the year t, X_{it} denote exogenous explanatory

variables related to the hypotheses and controls (*Code and soft quota*, *EU Directive proposal*, *Age*[vi], and *Regulated Industry*), Z_{it} denote potential endogenous explanatory variables that are instrumented and variable over time (*Percentage of women directors*, Δ*Percentage of women director>0*, Δ*Percentage of women director*, *Board size*, *Independent directors*, *Proprietary directors*, *Board tenure*, *Duality*, *Family firm*, *Assets*, and *Leverage*), $\sum_{t=2003}^{2016} A_t$ is a set of time dummy variables, and ε_i represents the random error term. This estimator controls for endogeneity by using lagged values of the independent variables included in the model as instruments for the variables that are not strictly exogenous, and for unobservable heterogeneity by decomposing the random error term ε_i into two parts: a combined effect dependent on individual and time periods, and an individual effect capturing firm characteristics and held constant over time. To test the GMM model specification validity, we employ M2 statistics to verify the lack of second-order serial correlation in the first-difference residuals and the Hansen statistics of overidentifying restrictions to test for the absence of correlation between the instruments and the error term. We note that none of the endogenous instrumented variables are constant over time. In order to control for extreme values, for probit and GMM models we apply a 1% winsorization in the continuous variables.

5. Empirical results and discussion

5.1. Descriptive statistics

Table 3 Panel A shows firm characteristics, and Panel B displays directors' professional, educational, and international backgrounds. Panels C, D, and E show differences before and after the enactment (or threat) of legislation in female directors', male directors', and female and male post-law directors' human capital.

- Insert Table 3 -

Percentage of women directors averages 9.2. Our sample has higher *market-to-book ratios* and lower *earnings management* than their industries. Spanish boards average 11

directors of whom 34.9 percent are *independent* and 38.7 percent are *proprietary directors*. Average *board tenure* is 88.7 months, and for 42.5 percent of firms the CEO is also Chair (*Duality*). *Family firms* comprise 67.2 percent. Firms have a 0.7 *leverage* ratio, are 45 years old (*Age*), and 29 percent belong to a *regulated industry*.

Regarding human capital (Table 3 Panel B), firms appoint directors with greater previous executive experience in non-listed than in listed firms. Male directors possess greater executive listed and non-listed firm experience than do women directors. Gender differences in non-business experience are smaller, although men have more experience than women directors as *politician* (15.3 versus 11.9 percent) and *civil servant* (10.7 versus 7.5 percent). There are more women than men *professors* (14.3 versus 14.1 percent), but only the share of *consultants* is statistically larger among women (13.8 versus 10.7 percent). The share of a *bachelor's degree* is larger for male directors than for female directors (94.1 versus 90.7 percent); however, *post-baccalaureate degree* and *PhD* share are larger for women (40.5 and 19.4 percent) than men (36.2 and 15.6 percent). Although women directors have higher *international studies* and *international labour experience*, only studies is statistically significant.

Table 3 Panel C results reveal that women appointed after the enactment (or threat) of initiatives have higher levels of non-business related backgrounds, education, and international experience, but lower levels of CEO and Chair experience in listed firms vis-a-vis pre-initiative enactment/threat counterparts. Additionally, women appointed after the code and soft quota also have lower levels of experience as *senior managers of listed firms*. There are no statistically significant differences among women's background as CEO and Chair in non-listed firms depending on appointment date and women's background as *senior managers in listed firms* before and after the threat of supranational quota. Only women appointed after the enactment/threat of gender diversity regulation have greater experience as

senior managers in non-listed firms as compared with their pre-enactment/threat initiatives' counterparts.

Table 3 Panel D shows differences in human capital between men directors appointed before and after the enactment (or threat) of board gender diversity initiatives. Post-initiative men directors present higher international experience, less experience in executive positions in listed firms (except as *senior managers in listed firms* before and after the EU proposal) and are highly educated (*bachelor's* and *post-baccalaureate*). In contrast, men directors who join boards after the enactment (and threat) of diversity initiatives present less experience as *Chair in non-listed firms,* but more experience as *senior managers in non-listed* firms and *consultants,* and are less likely to hold a *PhD.* The code and soft quota significantly decrease male directors' *civil servant* and *politician* experience, but increase *CEO in non-listed firms* and *Professor* experience. Overall, results reveal similarities among post-initiative women and men directors relative to their pre-initiative counterparts: post-initiative directors are less likely to have listed firm executive experience, but higher levels of education and international experience.

Table 3 Panel E compares post-initiative women and men directors. Post-initiative women directors have more *professor* and *consultant* experience, are more likely to hold a *PhD,* and greater international experience than their male counterparts. By contrast, post-initiative men directors are more likely than women to have executive experience on both listed and non-listed firms, but there are no statistically significant gender differences in prior experience as *senior managers in listed* and *non-listed firms* after the EU Directive proposal. Overall, relative to men, post-initiative women directors are less likely to have executive experience, and more likely to have academic and international experience.

5.2. Factorial analysis

Table 4 presents factorial analyses of human capital for women (Panel A) and men (Panel B) directors appointed before and after the initiatives.

- Insert Table 4 -

Before legislation, women directors' experience and training can be summarized with three specific background profiles: non-business sector experience, high levels of education, and international experience (female type i); high executive experience in listed and non-listed firms, but not high educational attainment and international experience (female type ii); and post-baccalaureate degree and high international experience, but not high executive and non-executive experience (female type iii) (Table 4 Panel A; Figure 1). Following a code and soft quota, female type i continues to be appointed to the board although types ii and iii are replaced by type iv (Figure 2), a finding that holds pre- and post-supranational threat (Figures 3 and 4).

For men directors (Table 4 Panel B), we identify two pre-code/soft quota profiles: academic and politics experience and high levels of education, but not high levels of international experience (male type i), and previous experience as Chair and CEO in listed firms as well as Professors, with a PhD but lower international experience (male type ii) (Figure 5). Post-code/quota men directors classify into two categories: executive experience in non-listed firms, a post-baccalaureate degree, and high international experience (male type iii) and non-business sector experience, high levels of education, and international experience (male type iv) (Figure 6). Before the EU proposal, men directors correspond to types i and iv (Figure 7); post-directive men directors correspond to types iii and iv (Figure 8).

Overall, the enactment (or threat) of initiatives brings changes to both women and men directors' profiles, highlighting new resource dependencies. Women with non-executive backgrounds, and high levels of education and international experience are most frequently appointed before and after gender diversity initiatives. However, post-initiative boards do not

frequently appoint women with just executive experience or with a post-baccalaureate degree and international experience. Rather, post-regulation newly appointed women combine these two profiles as they have executive experience, a post-baccalaureate degree, and high international experience. We observe only two male director profiles before a code/soft quota: non-executive experience and high educational attainment (similar to the most common female profile, but with lower international experience) and executive experience in listed firms, but lower international experience. Post-code/soft quota, new men directors are more likely to possess non-listed firm executive experience, a post-baccalaureate degree, and higher degrees of international experience, and men directors from non-business sectors are more likely to have high international experience after the enactment of code/soft quota (i.e., the same profile most commonly found among women). Post quota threat, men with greater executive experience in non-listed firms, post-baccalaureate studies, and international experience are selected ahead of men with non-executive experience, a PhD, and international experience.

5.3. Impact of gender diversity legislation on women directors' profiles

Table 5 summarizes probit results for subsamples of women (Panel A), men (Panel B), and both women and men (Panel C) directors. Models 1 to 6 relate to executive experience (Hypothesis 1a), Models 7 to 10 to non-executive background (Hypothesis 1b), and Models 11 to 15 to educational and international experience (Hypothesis 1c). Although coefficients are not reported, all regression models include controls and time dummy variables that allow us to control for firms' characteristics and the evolution of directors' profiles.

- Insert Table 5 -

Compared to pre-legislation counterparts, women directors appointed after the code/soft quota are less likely to have experience as CEO and Chair in listed firms (Models 3A and 5A), and more likely to have experience as *senior managers in non-listed firms*

(Model 2A). Among women, post-supranational threat directors are more likely to present previous experience as *CEO in non-listed firms* (Model 4A) and less likely to have experience as *senior managers in non-listed firms* (Model 2A). Among men directors, appointment after code/soft quota are less like to have experience as *CEO in listed firms* (Model 3B) and *Chair in* both *listed* and *non-listed firms* (Models 5B and 6B), but more likely as *senior managers in non-listed firms* (Model 2B). Despite similar patterns among women (Panel A) and men (Panel B), the whole sample (Panel C) indicates that being a women director decreases the likelihood of any prior executive experience (Models 1C to 6C) relative to men, partially supporting H1a. Following regulation, women directors have more executive expertise in non-listed firms than pre-regulation women; however, this experience is confined to senior management in non-listed firms, and not the highest positions (CEO and Chair) in listed firms. After regulation, both women and men directors are less likely to have CEO and Chair experience.

Regarding directors' non-executive experience, the subsample of women directors provides only partial support for H1b. Women directors appointed post-code/soft quota are more likely to have experience as *politicians* and *consultants* compared with pre-legislation counterparts (Models 8A and 10A). The men's subsample reveals that men appointed after the code/soft quota are more likely to have experience as *consultant* than pre-code/soft quota male directors (Model 10B). For women and men director subsamples, appointment after gender initiatives does not influence the likelihood of experience as *professors* (Model 7A and 7B), *politicians* (Model 8B only for men), *civil servants* (Models 9A and 9B), and *consultants* (Model 10A only for women). Considering the whole sample, women are less likely to have experience as *civil servants* than men (Model 9C), and post-code/soft quota directors are more likely to have *consultant* experience than their pre-legislation counterparts, regardless of gender (Model 10C). The results again partially support H1b: post-regulation

women directors are more likely to have non-executive experience compared with women pre-regulation directors, but only as *politicians* and *consultants*.

Appointment *after the enactment of the code and the soft quota* increases the likelihood of women with a *post-baccalaureate degree* (Model 12A). The enactment or threat of diversity regulation does not influence women directors' likelihood of a *bachelor's* (Model 11A) or *PhD* (Model 13A). For men directors appointed after the code/soft quota, there is a lower likelihood of a *PhD* (Model 13B), but men appointed post-EU proposal threat are more likely to hold a *PhD* (Model 13B). Considering the whole sample, women directors are less likely to hold a *bachelor's* than men directors. Additionally, a woman director appointed after the code/soft quota is more likely to hold a *bachelor's* (Model 11C). For the whole sample gender and appointment date do not influence directors' likelihood of a *post-baccalaureate degree* (Model 12C). The likelihood of holding a PhD increases for directors appointed after a supranational quota proposal (regardless of gender), but decreases for directors appointed after the code/soft quota (Model 13C). Women directors appointed after code/soft quota are more likely to have both *international studies* and *international work experience* in comparison with pre-regulation women (Models 14A and 15A). Similarly, men directors appointed after the EU proposal threat are more like to present *international work experience* than pre-threat men directors (Model 15B). Women directors appointed after a code/soft quota are more likely to have both *international studies* and *labour experience* (Models 14C and 15C) while male directors appointed after the EU proposal present higher degrees of *international labour experience* (Model 15C). Overall, these results support partially H1c since women appointed post-code/soft quota are more likely to have a *post-baccalaureate degree* than their pre-legislation counterparts and to hold a *bachelor's* and have higher international experience than other directors.

Altogether, probit model results correspond with the newly post-regulation (Table 4; Panel A) female director profile: previous executive experience, a post-baccalaureate degree, and international experience. Our results support resource dependence theory in that firms facing a code, quota, or threat of a supranational quota seek to appoint women directors with experience from politics, consultancy, and as senior managers in non-listed firms, educational qualifications, and international backgrounds, when compared to their pre-legislation female counterparts. However, new female directors' human capital is still lower relative to male directors, suggesting that the demand for new female directors with certain skillsets outstrips the supply. Our findings support resource dependence theory arguments such that after a soft quota is enacted, boards will appoint directors with substantial human capital attributes. Both women and men seeking director appointments should focus on building requisite experience desired by boards. On the policy front, compared with earlier research in hard quota contexts, the soft board gender diversity regulations seem to have a smoother effect on women directors' executive experience.

5.4. Impact of gender diversity legislation on corporate outcomes

Table 6 conveys the GMM regression results testing Hypothesis 2 on the impact of gender diversity legislation on firm value and earnings management.

- Insert Table 6 -

Models 1 and 6 suggest that the percentage of women directors does not influence firm market value and earnings management. Likewise, the increase in women directors does not influence firm market value and earning managements (Models 2 to 5, and 7 to 10). Findings do not support Hypothesis 2 and point to differences between the impact of soft gender diversity regulation and the threat of regulation on firm outcomes (no significant effect) vis-a-vis the impact of hard gender quotas on firm outcomes (negative). From an upper echelons theory perspective, we find limited evidence that the non-punitive regulation-

driven increase of women directors meaningfully affects firm outcomes. These findings imply that practitioners should focus on other levers with greater potential to drive firm outcomes. For policy, board gender diversity soft regulations reshape board composition, but not firm outcomes.

5.5. Robustness checks and additional results

We repeat our estimations with additional measures and models. First, we revise Table 5 models to consider alternative measures of director attributes: a set of variables that identify a director's professional experience as senior manager in listed or non-listed firms, as CEO in listed or non-listed firms; as Chair in listed or non-listed firms; as senior manager, CEO, or Chair in listed firms; and as senior manager, CEO, or Chair in non-listed firms; a variable for a director's educational attainment in general; and a variable for a director's international background whether linked to education or labour experience. The results reveal minor differences from the main analyses. Second, we run Table 6 GMM models with the dependent variable return on assets, and find similar results. Third, we replace the percentage of women directors from Table 6 with Blau (1977) and Shannon (1948) gender diversity indices, and the results are the same. Fourth, we remove from the Table 6 models the firm-year observations where *leverage* ratio exceeds 1 (i.e., negative shareholder equity), and find the same results. Fifth, we estimate Table 6 Models 1 and 6 for four subsamples: pre-code and pre-soft quota; post-code and post-soft quota; pre-EU Directive proposal; and Post-EU Directive proposal. The percentage of women directors is not statistically significant, thereby supporting the lack of impact of an increase in women's board presence on corporate outcomes. Sixth, we estimate Table 6 models by applying a 5% of winsorization, and the results are the same. Seventh, we estimate Table 6 models with one lag of the model's independent variables as instruments, since it is difficult to identify outside instruments uncorrelated with the error term and that contain enough information about endogenous

explanatory variables and hard to demonstrate those conditions (Pindado and Requejo, 2015). IV results are similar to GMM, although we find a positive impact of percentage of women directors on market-to-book ratio. Finally, due to limited availability, we are unable to apply GMM to estimate the impact of gender diversity regulation on CSR. Thompson Reuters Eikon (TRE) only reports data for 42 of our sample's 166 firms. As GMM requires a lower number of instruments than firms, even if we limit the number of instruments as much as possible, our model accounts for 106. As IV are less strict than GMM models, we repeat Table 6 models with CSR variables and apply IV. The dependent variable ESG collects firms' reported data across 10 topics in three categories: environmental, social, and governance performance. The results are similar: a post-code/quota/threat increase in women directors does not impact firm ESG performance.

6. Summary and conclusions

Our research analyses the consequences of a code, soft quota, and threat of supranational legislation that aims to increase women's boardroom presence on women directors' human capital attributes and corporate outcomes. Partially supporting resource dependence theory predictions, women directors' human capital improves with code approval and soft quotas and with the supranational threat, or remain unchanged. Women with non-executive and executive backgrounds, high levels of education, and considerable international experience are most frequently appointed both before and after the enactment (or threat) of board gender diversity initiatives. However, after gender diversity regulation, newly appointed women directors' profiles combine two distinct profiles observed pre-regulation: directors with executive experience and directors with post-baccalaureate degrees and international experience. These results align with Dang, Bender, and Scotto (2014) and Hillman et al. (2002) who show that women are more likely to have non-business experience, but differ from hard quota contexts (Ahern and Dittmar, 2012; Bertrand et al., 2014), as we find a

negative impact of regulation on women directors' executive experience in listed firms (CEO/Chair), and also for men.

The approval of a code of good governance that includes gender equality recommendations or a soft quota (i.e., Spanish Equality Law), and the threat of supranational hard quota do not seem to impact corporate outcomes. The lack of positive influence of the code and soft quota on outcomes contradicts upper echelons theory, and differs significantly from Ahern and Dittmar (2012) and Bertrand et al. (2014) who report that the Norwegian quota negatively impacts firm value as a consequence of appointing women directors with less management experience than men directors.

Before concluding, we acknowledge several limitations to address in future research. First, our single country data results may not be generalizable to other countries. While we compare our findings to hard quota countries such as Norway, future studies should examine the impact of other countries' codes, soft quotas, and threats of legislation. Second, we lack degree data (e.g., business or non-business). Third, we do not consider the role of active research by gender diversity scholars in pushing for legislation (Sealy et al., 2017).

In addition to the directions stemming from our limitations, we outline other promising paths. Future research could explore the impact of gender diversity initiatives on board gender diversity, directors' attributes, and firm performance considering firms' ownership characteristics, particularly the possible differential effect between family and non-family firms (Gregorič and Hansen, 2017). This line of research might explore the expected regulation to increase boards' ethnic diversity (Guest, 2019). Further research should deepen resource dependence theory by consider which resources are most desirable for firms, and upper echelons theory by exploring the impact of gender diversity regulation on firms' strategies and gender-specific actions such as women's access to top management positions or the share of women in senior management. This research could explore whether

newly appointed female directors face a glass cliff identified in studies of female CEOs and other leaders (e.g., Ryan and Haslam, 2005; Mulcahy and Linehan, 2014), including UK boardrooms (Main and Gregory-Smith, 2018). Future research could extend Zalata et al.'s (2019) findings that female directors holding monitoring roles are less likely to engage in managerial opportunism.

[i] Although we build on these two theories, we acknowledge that these theories share arguments with other theoretical frameworks such as agency theory.

[ii] Spanish subsidiary firms have a low free-float which may be reflected in firm market value. We only identified three subsidiary firms.

[iii] The share of independence directors may enhance firm outcomes through monitoring (Fama, 1980) and advising (Pfeffer and Salancik, 1978) and the share of proprietary directors may also enhance corporate outcomes. Extant board tenure research suggests a positive influence on firm outcomes (Kosnik, 1990) since experienced directors better understand firms' specificities; however, tenure is also associated with rigidity, insulation from new ideas (Katz, 1982), and less effective monitoring (Vafeas, 2003). CEO duality is frequently associated with lower corporate outcomes (Balinga, Moyer, and Rao, 1996). Evidence on family ownership and firm outcomes is mixed (Sacristán-Navarro, Cabeza-García, and Gómez-Ansón, 2011). Firm age positively influences corporate outcomes due to greater experience, reputation, business relationships, and networks, but also negatively through organizational rigidity (Coad et al., 2018). The firm size-outcomes relationship is unclear: large firms may benefit from learning effects, economies of scale, competitive power, and other efficiencies (Geroski, 1998), but small firms accrue benefits from greater entrepreneurial dynamism, internal flexibility, and responsiveness (Rothwell, 1989). Leverage aids monitoring mechanisms (Jensen 1986) that enhance firm outcomes, but financial distress decreases firm value (Opler and Titman, 1994). Regulated industries can explain firm outcomes (Asquer, 2018).

[iv] Board size is expected to positively impact board gender diversity (Hyland and Marcellino, 2002). Regarding structure, boards with higher shares of non-executive directors also have greater gender diversity (Carter et al., 2003; Ben Amar et al., 2013). As the share of female directors may affect firm outcomes (Carter et al. 2003), directors representing shareholders' interests may promote board gender diversity. Board tenure may inhibit gender diversity since the longer board tenure results in fewer available board seats. As equity-based compensation is positively related to the presence of women directors and CEO/Chair duality (Adams and Ferreira, 2009), a dual CEO/Chair may not be as willing to appoint women directors to reduce the turnover-performance sensitivity (Nekhili and Gatfaoui, 2013). Board gender diversity may also be influenced by family ownership (Nekhili and Gatfaoui, 2013) as women are more likely to serve as directors of family-controlled firms. Women directors are also more like to be appointed in young (Skaggs, Stainback, and Duncan, 2012) and large firms (Adams and Ferreira, 2009), with high leverage ratios (Labelle et al., 2010), and in regulated industries (Hyland and Marcellino, 2002).

[v] Professional executive experience variables include Senior manager, CEO, and Chair (Ahern and Dittmar, 2012), although previous literature does not distinguish between public and private firms. Professional non-executive experience: professor (Ahern and Dittmar, 2012; Heemskerk and Fennema, 2014; Solimene et al. 2017), politician (Heemskerk and Fennema, 2014), and consultant (Ahern and Dittmar, 2012). We augment previous literature by incorporating a civil servant variable. Educational attainment variables are Bachelor's degree (Bertrand et al. 2014; Ferrari et al. 2018; Nekhili and Gatfaoui, 2013), Post-baccalaureate degree (Ahern and Dittmar, 2012; Nekhili and Gatfaoui, 2013; Solimene et al. 2017), and PhD (Bertrand et al. 2014; Nekhili and Gatfaoui, 2013; Solimene et al. 2017). Prior research measures international experience with directors' nationality (Nekhili and Gatfaoui, 2013); we follow Ferrari et al. (2018) and consider international studies, and add a new variable: international labour experience.

[vi] Age is considered an exogenous variable following Coad et al. (2018).

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Table 1: Gender board quotas and codes of good governance that include board gender diversity recommendations in Spain

Date	Name	Type	Target	Territorial scope	Due to	Sanctions	Norm
2006	Unified Good Governance Code	Code of good governance		Spain		No	"When women directors are few or non-existent, the board should state the reasons for this situation and the measures taken to correct it; in particular the Nomination Committee should take steps to ensure that: a) The process of filling board vacancies has no implicit bias against women candidates; b) The company makes a conscious effort to include women with the target the candidates for board places". "The Nomination Committee should have the following functions in addition to those stated in earlier recommendations: […] d) Report to the board on the gender diversity issues discussed in Recommendation 14 of this Code."
2007	Constitutional Act 3/2007 of 22 March for effective equality between women and men	Quota	40%	Spain	2015	No, but lack of gender diversity will impact consideration for public subsidies and state contracts	"Article 75. Women's participation in mercantile companies' boards of directors. Companies obliged to present unabridged financial statements of income will endeavour to include a sufficient number of women on their boards of directors to reach a balanced presence of women and men within eight years of the entry into effect of this Act. The provisions of the preceding paragraph will be taken into account when making appointments on the occasion of the finalization of the terms of directors designated prior to the entry into force of this Act." "Additional provision one. Balanced presence or membership. For the intents and purposes of this Act, balanced membership will be understood to mean the presence of women and men in the context in question in a manner such that neither sex accounts for more than sixty nor less than forty per cent of the total."
2012	Proposal for a Directive of on improving the gender balance among non-executive directors of companies listed on stock exchanges and related measures	Quota	40%	European Union	2020	Administrative fines; nullity or annulment of the appointment or of the election of non-executive directors	Member States shall ensure that listed companies in whose boards members of the under-represented sex hold less than 40 per cent of the non-executive director positions make the appointments to those positions on the basis of a comparative analysis of the qualifications of each candidate, by applying pre-established, clear, neutrally formulated and unambiguous criteria, in order to attain the said percentage at the latest by 1 January 2020 or at the latest by 1 January 2018 in case of listed companies which are public undertakings.

Source: European Commission (2012), European Corporate Governance Institute (2021), and Gender Equality Act (200719)

Table 1 (continued): Gender board quotas and codes of good governance that include board gender diversity recommendations in Spain

2013	Unified Good Governance Code	Code of good governance		Spain		No	Update of Unified Good Governance Code (2006). No new gender diversity recommendations and/or considerations are introduced.
2015	Good Governance Code of Listed Companies	Code of good governance	30%	Spain	2020	No	"Diversity of board of directors membership is another key issue, addressed by the inclusion of a new programmatic norm in company legislation. In this context, companies are encouraged to put on record their commitment to a diverse board of director membership from the first stage of identifying prospective candidates. They should also think of including concrete targets as a means to combat the still insufficient presence of women on company boards." "The board of directors should approve a director selection policy that: […] c) Favours a diversity of knowledge, experience and gender. […] The director selection policy should pursue the goal of having at least 30% of total board places occupied by women directors before the year 2020. The nomination committee should run an annual check on compliance with the director selection policy and set out its findings in the annual corporate governance report." "The board in full should conduct an annual evaluation, adopting, where necessary, an action plan to correct weakness detected in: […] c) The diversity of board membership and competences. […]"
2020	Good Governance Code of Listed Companies	Code of good governance	30%	Spain	2022	No	Update of Good Governance Code of Listed Companies (2015). It introduces that "[…] the number of female directors should account for at least 40% of the members of the board of directors before the end of 2022 and thereafter, and not less than 30% previous to that."

Source: European Commission (2012), European Corporate Governance Institute (2021), and Gender Equality Act (2007)

Table 2: Variables

Panel A: Firm-level variables

Variables	Description
Gender diversity on board and regulation	
Percentage of women directors (%)	Percentage of female directors at the board
Δ Percentage of women directors> 0	Dummy = 1 if percentage of women directors in t-percentage of women directors in t-1 is positive (i.e. > 0) and = 0 otherwise
Δ Percentage of women directors	Percentage of women directors in t-percentage of women directors in t-1
Code and soft quota	Dummy = 1 from 2007 onwards and = 0 otherwise
EU Directive Proposal	Dummy = 1 from 2012 onwards and = 0 otherwise
Firm characteristics	
Market-to-book ratio	Firm market value or capitalization plus book value of debt divided by book value of total assets for each firm and year minus industry median each year
Earnings management	Firm industry-adjusted earning management defined as: earnings management estimated following Jones (1991) for each firm and year minus the industry median each year
Board size	Number of board directors.
Independent directors (%)	Proportion of independent directors. Independent directors are non-executive directors who do not have any kind of relationship with the company or significant shareholders.
Proprietary directors (%)	Proportion of proprietary directors. Proprietary directors are non-executive directors who represent significant shareholders.
Board tenure	Average number of months since the directors were appointed to the board
Duality	Dummy = 1 if CEO is also Chair of the board and = 0 otherwise
Family firm	Dummy = 1 if families and individuals have over 10 percent voting rights and = 0 otherwise
Age	Number of years since firm founding
Assets (ln)	Natural logarithm of the book value of total assets in thousands of euros
Leverage	Book value of total debt/book value of total assets
Regulated industry	Dummy = 1 if regulated industry (energy, electricity, telecom, and transport) and = 0 otherwise

Panel B: Director-level variables

Variables	Description
Gender diversity on board and regulation	
Female	Dummy = 1 if director is a female and = 0 otherwise.
Appointed after code and soft quota	Dummy = 1 if director was appointed on board from 2007 onwards and = 0 otherwise.
Appointed after EU Directive proposal	Dummy = 1 if director was appointed on board from 2012 onwards and = 0 otherwise.
Human capital directors' characteristics	
Senior manager in listed firms	Dummy = 1 if director has experience as senior manager in listed firms and = 0 otherwise.
Senior manager in non-listed firms	Dummy = 1 if director has experience as senior manager in non-listed firms and = 0 otherwise.
CEO in listed firms	Dummy = 1 if director has work experience as CEO in listed firms and = 0 otherwise
CEO in non-listed firms	Dummy = 1 if director has work experience as CEO in non-listed firms and = 0 otherwise
Chair in listed firms	Dummy = 1 if director has work experience as Chair in listed firms and = 0 otherwise.
Chair in non-listed firms	Dummy = 1 if director has work experience as Chair in non-listed firms and = 0 otherwise.
Professor	Dummy = 1 if director has work experience as professor and = 0 otherwise.
Politician	Dummy = 1 if director has work experience as politician and = 0 otherwise.
Civil servant	Dummy = 1 if director has work experience as civil servant and = 0 otherwise.
Consultant	Dummy = 1 if director has with work experience as consultant and = 0 otherwise.
Bachelor's degree	Dummy = 1 if director holds at least a bachelor's degree and = 0 otherwise.
Post-baccalaureate degree	Dummy = 1 if director holds at least post-baccalaureate degree and = 0 otherwise.
PhD	Dummy = 1 if director holds at least a PhD and = 0 otherwise.
International studies	Dummy = 1 if director has at least a bachelor's degree abroad and = 0 otherwise.
International labour experience	Dummy = 1 if director has international work experience and = 0 otherwise.

Table 3: Descriptive statistics and univariate analysis

Panel A: Firm-level variables

Variable	Mean/ Freq. (a)	Standard Deviation	Min	Median	Max	N
Percentage of women directors (%)	9.21	10.31	0	7.69	57.14	1,321
Δ Percentage of women directors > 0 (a)	22.76	0.42	0	0	1	1,205
Δ Percentage of women directors	0.89	5.30	-22.22	0	44.44	1,205
Market-to-book ratio	0.11	0.87	-5.67	0	8.86	1,321
Earnings management	-0.10	0.39	-7.18	0	4.73	1,205
Board size	10.83	3.50	3	10	22	1,321
Independent directors (%)	34.87	17.48	0	33.33	100	1,321
Proprietary directors (%)	38.70	21.87	0	40	100	1,321
Board tenure	88.74	50.34	1	79	290	1,321
Duality (a)	42.54	0.49	0	0	1	1,321
Family firm (a)	67.22	0.47	0	1	1	1,321
Age	45.17	27.49	1	39	142	1,321
Assets (ln)	13.95	1.91	9.16	13.76	18.39	1,321
Leverage	0.66	0.30	0.07	0.66	3.64	1,321
Regulated industry (a)	28.99	0.45	0	0	1	1,321

Panel B: Director-level variables

Variable		Female (N = 1,214)	Male (N = 12,086)	Total (N = 13,300)	Chi-squared test (Female vs male directors)
Senior manager in listed firms	Freq.	23.06	32.64	31.77	46.679***
	SD	0.42	0.47	0.47	
Senior manager in non-listed firms	Freq.	27.10	32.14	31.68	12.927***
	SD	0.44	0.47	0.47	
CEO in listed firms	Freq.	8.81	28.39	26.61	216.631***
	SD	0.28	0.45	0.44	
CEO in non-listed firms	Freq.	25.29	39.57	38.26	95.207***
	SD	0.42	0.49	0.49	
Chair in listed firms	Freq.	6.18	21.70	20.28	164.249***
	SD	0.24	0.41	0.40	
Chair in non-listed firms	Freq.	22.24	40.24	38.60	150.884***
	SD	0.42	0.49	0.49	
Professor	Freq.	14.25	14.12	14.13	0.017
	SD	0.35	0.35	0.35	
Politician	Freq.	11.86	15.32	15.01	10.366***
	SD	0.32	0.36	0.36	
Civil servant	Freq.	7.50	10.74	10.44	12.411***
	SD	0.26	0.31	0.31	
Consultant	Freq.	13.76	10.65	10.93	10.941***
	SD	0.34	0.31	0.31	
Bachelor's degree	Freq.	90.69	94.12	93.93	22.672***
	SD	0.29	0.23	0.24	
Post-baccalaureate degree	Freq.	40.53	36.22	36.61	8.837***
	SD	0.49	0.48	0.48	
PhD	Freq.	19.36	15.94	16.25	9.492***
	SD	0.40	0.37	0.37	
International studies	Freq.	33.61	27.81	28.34	18.267***
	SD	0.47	0.45	0.45	
International labour experience	Freq.	33.28	31.9	32.03	0.956
	SD	0.47	0.47	0.47	

Table 3 (continued): Descriptive statistics and univariate analysis

Panel C: Female directors' human capital characteristics

Variable	Code and soft quota			EU Directive proposal		
	Pre- law	Post-law	Chi-squared	Pre-law	Post-law	Chi-squared
Senior manager in listed firms	27.19	19.41	10.322***	22.54	25.21	0.768
Senior manager in non-listed firms	18.25	34.94	42.645***	25.72	32.77	4.822**
CEO in listed firms	12.63	5.43	19.486***	10.35	2.52	14.586***
CEO in non-listed firms	25.61	25	0.060	24.28	29.41	2.664
Chair in listed firms	10.18	2.64	29.624***	6.86	3.36	4.052**
Chair in non-listed firms	20.88	23.45	1.155	22.85	19.75	1.064
Professor	10.35	17.70	13.371***	12.19	22.69	17.252***
Politician	6.31	16.77	31.611***	8.50	25.63	53.681***
Civil servant	4.39	10.25	14.987***	6.25	12.61	11.145***
Consultant	7.72	19.10	33.007***	11.37	23.53	23.834***
Bachelor's degree	84.04	96.58	56.405***	88.42	100	30.383***
Post-baccalaureate degree	34.21	46.12	17.788***	38.11	50.42	12.021***
PhD	14.39	23.76	17.013***	17.32	27.73	13.297***
International studies	21.93	43.94	65.674***	31.76	41.18	7.600***
International labour experience	19.30	45.65	94.581***	30.43	44.96	18.187***

Panel D: Male directors' human capital characteristics

Variable	Code and soft quota			EU Directive proposal		
	Pre-law	Post-law	Chi-squared	Pre-law	Post-law	Chi-squared
Senior manager in listed firms	33.96	29.61	22.007***	32.85	30.33	2.645
Senior manager in non-listed firms	28.40	40.69	177.144***	31.85	35.33	5.110**
CEO in listed firms	31.17	22.05	104.671***	29.31	18.22	55.486***
CEO in non-listed firms	38.18	42.73	22.132***	39.48	40.54	0.432
Chair in listed firms	24.88	14.43	164.504***	22.42	13.71	40.904***
Chair in non-listed firms	42.56	34.95	61.579***	40.93	32.63	26.241***
Professor	13.69	15.08	4.042**	13.99	15.52	1.761
Politician	15.75	14.34	3.903**	15.41	14.31	0.855
Civil servant	11.17	9.74	5.458**	10.78	10.31	0.210
Consultant	8.45	15.68	140.313***	10.18	15.82	30.559***
Bachelor's degree	92.94	96.90	72.656***	93.86	97.29	19.660***
Post-baccalaureate degree	34.43	40.31	38.317***	35.40	45.24	38.440***
PhD	17.82	11.62	73.319***	16.24	12.61	8.978***
International studies	25.76	32.50	57.826***	27.32	33.23	15.960***
International labour experience	28.70	39.25	131.047***	31.18	39.94	32.364***

Panel E: Female and male post-law directors' human capital characteristics

Variable	Code and soft quota			EU Directive proposal		
	Female	Male	Chi-squared	Female	Male	Chi-squared
Senior manager in listed firms	19.41	29.61	28.242***	25.21	30.33	2.430
Senior manager in non-listed firms	34.94	40.69	7.568***	32.77	35.33	0.556
CEO in listed firms	5.43	22.05	96.071***	2.52	18.22	36.747***
CEO in non-listed firms	25	42.73	71.741***	29.41	40.54	10.064***
Chair in listed firms	2.64	14.43	68.801***	3.36	13.71	19.907***
Chair in non-listed firms	23.45	34.95	32.666***	19.75	32.63	15.151***
Professor	17.70	15.08	2.883*	22.69	15.52	7.044***
Politician	16.77	14.34	2.571	25.63	14.31	17.876***
Civil servant	10.25	9.74	0.157	12.61	10.31	1.055
Consultant	19.10	15.68	4.728**	23.53	15.82	7.994***
Bachelor's degree	96.58	96.90	0.176	100	97.29	6.576*
Post-baccalaureate degree	46.12	40.31	7.631***	50.42	45.24	2.071
PhD	23.76	11.62	69.400***	27.73	12.61	33.505***
International studies	43.94	32.50	31.895***	41.18	33.23	5.348**
International labour experience	45.65	39.25	9.346***	44.96	39.94	2.002

Panel C: Code and soft quota: Pre-law: women appointed to the board before 2007 (N = 570); Post-law: women appointed to the board from 2007 onwards (N=644); EU Directive proposal: Pre-law: women appointed to the board before 2012 (N = 976); Post-law: women appointed to the board from 2012 onwards (N=238); Panel D: Code and soft quota: Pre-law: men appointed to the board before 2007 (N = 8,412); Post-law: men appointed to the board from 2007 onwards (N=3,674); EU Directive proposal: Pre-law: men appointed to the board before 2012 (N = 11,087); Post-law: men appointed to the board from 2012 onwards (N=999); Panel E: Code and soft quota: Women appointed to the board from 2007 onwards (N=644); Men appointed to the board from 2007 onwards (N= 3,674); EU Directive proposal Women appointed to the board from 2012 onwards (N = 238); Men appointed to the board from 2012 onwards (N=999) * p < 0,10; **p < 0,05; *** p < 0,01

Table 4: Gender diversity on boards laws: Factorial analysis

Panel A: Women directors' human capital characteristics

	Pre-code and pre-soft quota			Post-code and post-soft quota		Pre-EU Directive proposal			Post- EU Directive proposal	
Factors	F1	F2	F3	F1	F2	F1	F2	F3	F1	F2
Eigenvalue	2.89	2.14	1.23	1.59	1.40	2.16	1.65	1.30	2.00	1.24
Proportion	0.37	0.27	0.16	0.41	0.36	0.39	0.30	0.23	0.46	0.29
Variables										
Senior manager in listed firms	0.02	0.09	-0.05	-0.07	0.21	-0.08	0.15	0.11	-0.27	-0.01
Senior manager in non-listed firms	0.03	-0.16	0.06	0.10	**0.30**	0.14	-0.18	**0.35**	0.05	0.05
CEO in listed firms	0.15	**0.91**	-0.03	-0.08	**0.33**	-0.10	**0.79**	0.08	-0.03	**0.44**
CEO in non-listed firms	-0.08	-0.17	-0.21	0.11	0.14	-0.04	-0.16	-0.01	0.14	**0.26**
Chair in listed firms	-0.14	**0.89**	-0.25	-0.04	**0.30**	-0.27	**0.80**	0.14	-0.05	**0.36**
Chair in non-listed firms	-0.22	**0.60**	-0.01	0.14	0.09	-0.15	**0.41**	-0.05	0.13	**0.31**
Professor	**0.80**	0.08	-0.37	**0.41**	-0.59	**0.57**	0.17	-0.54	**0.56**	-0.43
Politician	0.21	-0.11	**0.26**	0.22	-0.22	0.22	-0.05	0.01	**0.34**	-0.36
Civil servant	**0.48**	0.17	-0.49	0.16	-0.27	0.23	0.11	-0.29	**0.33**	-0.32
Consultant	**0.30**	-0.05	0.04	**0.42**	0.17	**0.39**	0.04	0.18	**0.34**	0.04
Bachelor's degree	**0.29**	0.05	**0.28**	0.13	0.12	**0.28**	0.12	0.22	-	-
Post-baccalaureate degree	0.10	-0.14	**0.47**	0.14	**0.49**	0.12	-0.04	**0.55**	0.25	**0.27**
PhD	**0.83**	0.06	-0.23	**0.69**	-0.35	**0.69**	0.17	-0.37	**0.79**	-0.21
International studies	**0.67**	0.05	**0.45**	**0.57**	**0.38**	**0.62**	0.18	**0.37**	**0.61**	**0.39**
International labour experience	**0.74**	-0.09	**0.34**	**0.52**	**0.35**	**0.69**	0.01	**0.30**	**0.38**	**0.22**
Female type	Type (i)	Type (ii)	Type (iii)	Type (i)	Type (iv)	Type (i)	Type (ii)	Type (iii)	Type (i)	Type (iv)

Definitions
Type (i): Women with non-executive backgrounds, a PhD, and high international experience.
Type (ii): Women with previous executive experience.
Type (iii): Women with a post-baccalaureate degree and high international experience.
Type (iv): Women with previous executive experience [Type (ii) ∪ Type (iii)], a post-baccalaureate degree, and international experience.

Pre-code and pre-soft quota: women appointed to the board before 2007 (N = 570); Post-code and post-soft quota: women appointed to the board from 2007 onwards (N=644); Pre-EU Directive proposal: women appointed to the board before 2012 (N = 976); Post-EU Directive proposal: women appointed to the board from 2012 onwards (N=238).

Table 4 (continued): Gender diversity on boards laws: Factorial analysis

Panel B: Men directors' human capital characteristics

	Pre-Code and pre-soft quota		Post-Code and post-soft quota		Pre-EU Directive proposal		Post- EU Directive proposal	
Factors	F1	F2	F1	F2	F1	F2	F1	F2
Eigenvalue	1.20	1.11	1.20	1.01	1.16	1.12	1.43	1.05
Proportion	0.43	0.39	0.45	0.38	0.42	0.41	0.49	0.36
Variables								
Senior manager in listed firms (%)	-0.32	0.15	-0.03	-0.34	-0.33	-0.04	0.06	-0.41
Senior manager in non-listed firms (%)	0.04	-0.32	**0.36**	0.13	0.24	-0.26	**0.42**	0.19
CEO in listed firms (%)	-0.41	**0.32**	-0.02	-0.45	-0.48	0.03	0.08	-0.52
CEO in non-listed firms (%)	0.02	-0.32	**0.26**	0.10	0.19	-0.25	**0.23**	0.15
Chair in listed firms (%)	-0.23	**0.37**	-0.10	-0.29	-0.38	0.17	0.01	-0.27
Chair in non-listed firms (%)	0.05	-0.18	0.12	0.13	0.13	-0.09	0.16	0.13
Professor (%)	**0.54**	**0.33**	-0.38	**0.32**	**0.26**	**0.54**	-0.55	**0.26**
Politician (%)	**0.36**	0.24	-0.42	**0.29**	0.17	**0.42**	-0.47	0.10
Civil servant (%)	0.25	0.19	-0.36	0.07	0.09	**0.32**	-0.33	0.11
Consultant (%)	0.17	-0.01	-0.05	0.13	0.16	0.07	-0.02	0.11
Bachelor's degree (%)	0.13	0.07	-0.03	0.03	0.10	0.10	-0.13	-0.08
Post-baccalaureate degree (%)	0.02	-0.27	**0.34**	0.02	0.17	-0.23	**0.39**	0.07
PhD (%)	**0.47**	**0.29**	-0.28	**0.39**	**0.23**	**0.47**	-0.42	**0.33**
International studies (%)	**0.28**	-0.34	**0.38**	**0.32**	**0.44**	-0.15	**0.31**	**0.35**
International labour experience (%)	0.17	-0.33	**0.41**	**0.29**	**0.36**	-0.22	**0.27**	**0.32**
Male type	Type (i)	Type (ii)	Type (iii)	Type (iv)	Type (iv)	Type (i)	Type (iii)	Type (iv)

Definitions
Type (i): Men with non-executive backgrounds and a PhD.
Type (ii): Men with previous experience as executives in listed firms and also experience as Professors, a PhD, and low international experience.
Type (iii): Men with executive experience in non-listed firms, a post-baccalaureate degree and, high international experience.
Type (iv): Men with non-executive backgrounds, a PhD, and high international experience [Men Type (i) + international experience].

Pre-code and pre-soft quota: men appointed to the board before 2006 (N 8,412); Post-code and post-soft quota: men appointed to the board from 2006 onwards (N=3,674); Pre-EU Directive proposal: men appointed to the board before 2012 (N = 11,087); Post-EU Directive proposal: men appointed to the board from 2012 onwards (N=999).

Table 5: Impact of gender diversity on boards laws on directors educational, professional and international background

Panel A: Women Directors Sub-sample

Variables	Executive experience						Non-executive professional profiles			
	Model 1A Senior manager in listed firms	Model 2A Senior manager in non-listed firms	Model 3A CEO in listed firms	Model 4A CEO in non-listed firms	Model 5A Chair in listed firms	Model 6A Chair in non-listed firms	Model 7A Professor	Model 8A Politician	Model 9A Civil servant	Model 10A Consultant
Appointed after code and soft quota	-0.185	0.403**	-0.721**	-0.060	-0.845**	0.085	-0.168	0.392*	0.303	0.391***
	(-0.89)	(2.80)	(-2.45)	(-0.35)	(-2.13)	(0.43)	(-0.83)	(1.99)	(1.40)	(2.57)
Appointed after EU Directive proposal	0.238	-0.379*	0.239	0.459*	0.497	-0.313	0.311	0.0194	-0.086	-0.256
	(0.86)	(-1.94)	(0.54)	(1.99)	(1.05)	(-1.35)	(1.15)	(0.79)	(-0.27)	(-1.01)
Control variablesand year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LR	41.98***	49.47***	91.79***	33.50***	101.13***	46.05***	51.78***	80.39***	198.78***	71.98***
N observations	1,161	1,161	1,161	1,161	1,161	1,161	1,161	1,161	1,161	1,161

Panel B: Men Directors Sub-sample

Variables	Executive experience						Non-executive professional profiles			
	Model 1B Senior manager in listed firms	Model 2B Senior manager in non-listed firms	Model 3B CEO in listed firms	Model 4B CEO in non-listed firms	Model 5B Chair in listed firms	Model 6B Chair in non-listed firms	Model 7B Professor	Model 8B Politician	Model 9B Civil servant	Model 10B Consultant
Appointed after code and soft quota	-0.104	0.180**	-0.291***	0.003	-0.437***	-0.195**	0.067	0.073	-0.012	0.316***
	(-1.49)	(2.54)	(-4.26)	(0.04)	(-6.11)	(-3.54)	(0.95)	(0.91)	(-0.15)	(4.01)
Appointed after EU Directive proposal	-0.107	-0.263**	-0.160	0.056	0.045	-0.063	-0.066	-0.166	-0.015	-0.129
	(-0.90)	(-2.26)	(-1.37)	(0.61)	(0.37)	(-0.65)	(-0.51)	(-1.41)	(-0.12)	(-1.17)
Control variables and year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LR	96.11***	317.81***	98.92***	93.21***	142.25***	102.50***	43.44***	65.07***	70.25***	97.60***
N observations	10,968	10,968	10,968	10,968	10,968	10,968	10,968	10,968	10,968	10,968

Panel C: Total Directors Sample

Variables	Executive experience						Non-executive professional profiles			
	Model 1C Senior manager in listed firms	Model 2C Senior manager in non-listed firms	Model 3C CEO in listed firms	Model 4C CEO in non-listed firms	Model 5C Chair in listed firms	Model 6C Chair in non-listed firms	Model 7C Professor	Model 8C Politician	Model 9C Civil servant	Model 10C Consultant
Female	-0.318**	-0.197**	-0.779***	-0.458***	-0.747***	-0.511***	-0.012	-0.252	-0.239*	0.096
	(-2.37)	(-2.03)	(-5.26)	(-3.84)	(-3.95)	(-3.39)	(-0.09)	(-1.62)	(-1.68)	(0.74)
Appointed after code and soft quota	-0.100	0.179**	-0.295***	0.002	-0.435***	-0.194***	0.065	0.075	-0.012	0.316***
	(-1.45)	(2.51)	(-4.28)	(0.03)	(-6.08)	(-3.55)	(0.92)	(0.92)	(-0.14)	(4.01)
Appointed after code and soft quota × Female	-0.090	0.252*	-0.339	-0.061	-0.328	0.245	-0.165	0.271	0.225	-0.069
	(-0.42)	(1.66)	(-1.19)	(-0.34)	(-0.84)	(1.35)	(-0.88)	(1.41)	(1.35)	(-0.39)
Appointed after EU Directive proposal	-0.108	-0.264**	-0.141	-0.065	0.055	-0.063	-0.075	-0.185	-0.035	-0.153
	(-0.92)	(-2.30)	(-1.21)	(0.72)	(0.45)	(-0.65)	(-0.59)	(-1.59)	(-0.28)	(-1.38)
Appointed after EU Directive proposal × Female	0.276	-0.120	0.245	0.300	0.345	-0.135	0.331	0.466	0.127	0.122
	(0.92)	(-0.55)	(0.57)	(1.22)	(0.73)	(-0.60)	(1.37)	(1.63)	(0.44)	(0.45)
Control variables and year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LR	92.69***	248.61***	136.29***	99.09***	161.82***	174.01***	42.30**	92.65***	117.72***	92.67***
N observations	12,129	12,129	12,129	12,129	12,129	12,129	12,129	12,129	12,129	12,129

Values are unstandardized coefficients, with z values in parentheses. LR is a Likelihood ratio test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as χ^2 under the null hypothesis of no relationship for all explanatory variables. Models are estimated with the constant, year dummy variables, and controls (Independent directors; Proprietary directors; Board size; Duality; Family firm; Age; Assets; Leverage and Regulated industry); however, they are not reported in the table. * p < 0.10; **p < 0.05; *** p < 0.01.

Table 5 (continued): Impact of gender diversity on boards laws on directors educational, professional and international background

Panel A: Women Directors Sub-sample

Variables	Education			International experience	
	Model 11A Bachelor's degree	Model 12A Post-baccalaureate degree	Model 13A PhD	Model 14A International studies	Model 15A International labour experience
Appointed after code and soft quota	0.459 (1.53)	0.398*** (2.82)	-0.091 (-0.42)	0.374** (2.45)	0.348** (2.20)
Appointed after EU Directive proposal	-	0.065 (0.32)	0.097 (0.37)	-0.120 (-0.51)	-0.196 (-0.94)
Control variables and year effects	Yes	Yes	Yes	Yes	Yes
LR	124.72***	43.75***	129.63***	58.65***	60.02***
N observations	1,161	1,161	1,161	1,161	1,161

Panel B: Men Directors Sub-sample

Variables	Education			International experience	
	Model 11B Bachelor's degree	Model 12B Post-baccalaureate degree	Model 13B PhD	Model 14B International studies	Model 15B International labour experience
Appointed after code and soft quota	0.107 (0.87)	0.089 (1.50)	-0.185** (-2.13)	0.059 (0.83)	0.088 (1.32)
Appointed after EU Directive proposal	0.347 (1.31)	0.130 (1.36)	0.232* (1.91)	0.135 (1.33)	0.212** (2.06)
Control variables and year effects	Yes	Yes	Yes	Yes	Yes
LR	54.44***	94.20***	99.28***	68.07***	345.32***
N observations	10,968	10,968	10,968	10,968	10,968

Panel C: Total Directors Sample

Variables	Education			International experience	
	Model 11C Bachelor's degree	Model 12C Post-baccalaureate degree	Model 13C PhD	Model 14C International studies	Model 15C International labour experience
Female	-0.370*** (-2.69)	0.028 (0.23)	0.154 (1.21)	0.087 (0.67)	-0.040 (-0.30)
Appointed after code and soft quota	0.088 (0.75)	0.092 (1.53)	-0.179** (-2.09)	0.065 (0.93)	0.090 (1.37)
Appointed after code and soft quota × Female	0.577** (2.04)	0.207 (1.57)	0.079 (0.41)	0.292* (1.80)	0.320** (2.10)
Appointed after EU Directive proposal	0.404 (1.57)	0.118 (1.24)	0.189* (1.67)	0.134 (1.30)	0.212** (2.03)
Appointed after EU Directive proposal × Female	-	0.014 (0.07)	0.029 (0.13)	-0.340 (-1.51)	-0.508** (-2.49)
Control variables and year effects	Yes	Yes	Yes	Yes	Yes
LR	87.96***	114.17***	90.44***	98.72***	410.50***
N observations	12,129	12,129	12,129	12,129	12,129

Values are unstandardized coefficients, with z values in parentheses. LR is a Likelihood ratio test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as χ^2 under the null hypothesis of no relationship for all explanatory variables. Models are estimated with the constant, year dummy variables, and controls (Independent directors; Proprietary directors; Board size; Duality; Family firm; Age; Assets; Leverage and Regulated industry; however, they are not reported in the table. * p < 0.10; **p < 0.05; *** p < 0.01.

Table 6: Impact of gender diversity on boards laws on firm value and performance

Variables	Market-to-book ratio					Earnings management				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Percentage of women directors (%)	0.003					0.001				
	(0.51)					(0.70)				
Δ Percentage of women directors > 0		-0.020					0.020			
		(-0.73)					(1.29)			
Δ Percentage of women directors > 0 × Code and soft quota			-0.001					0.009		
			(0.01)					(0.36)		
Δ Percentage of women directors > 0 × EU Directive proposal			-0.053					0.019		
			(-0.76)					(0.53)		
Δ Percentage of women directors				-0.001					0.001	
				(-0.35)					(1.09)	
Δ Percentage of women directors × Code and soft quota					-0.004					0.003
					(-1.07)					(1.10)
Δ Percentage of women directors × EU Directive proposal					0.006					-0.002
					(1.32)					(-0.84)
Independent directors (%)	-0.003	0.002	0.002	0.002	0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-0.62)	(0.35)	(0.36)	(0.45)	(0.32)	(-0.45)	(-0.60)	(-0.58)	(-0.51)	(-0.97)
Proprietary directors (%)	0.001	0.005	0.006	0.006	0.006*	-0.004***	-0.004***	-0.004***	-0.004***	-0.005***
	(0.07)	(1.48)	(1.59)	(1.48)	(1.71)	(-2.68)	(-2.71)	(-2.97)	(-2.58)	(-2.90)
Board tenure	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-0.16)	(-0.74)	(-0.74)	(-0.18)	(-0.48)	(-0.56)	(-0.41)	(-0.35)	(-0.67)	(-0.66)
Duality	-0.080	-0.110	-0.092	-0.127	-0.080	0.021	0.028	0.028	0.032	0.030
	(-0.52)	(-0.84)	(-0.68)	(-1.18)	(-0.69)	(0.60)	(0.79)	(0.84)	(0.89)	(0.93)
Family firm	0.215**	0.264**	0.263***	0.285**	0.301**	-0.119***	-0.135***	-0.130***	-0.126***	-0.129***
	(2.19)	(2.37)	(2.84)	(2.07)	(2.47)	(-2.74)	(-2.95)	(-2.87)	(-2.76)	(-2.68)
Age	0.008	0.011	0.011	0.008	0.009	-0.002	-0.001	-0.001	-0.001	0.001
	(1.04)	(1.52)	(1.32)	(1.06)	(0.97)	(-0.11)	(-0.44)	(-0.54)	(-0.20)	(0.27)
Assets (ln)	-0.294**	-0.506**	-0.480**	-0.378*	-0.465**	-0.027	0.012	0.012	-0.012	-0.038
	(-1.98)	(-2.30)	(-2.48)	(-1.81)	(-2.37)	(-0.45)	(0.20)	(0.23)	(-0.26)	(-0.69)
Leverage	0.060	0.121	0.076	0.123	0.147	-0.446***	-0.293*	-0.314**	-0.303**	-0.352**
	(0.13)	(0.26)	(0.15)	(0.25)	(0.36)	(-2.63)	(-1.85)	(-2.02)	(-2.31)	(-2.36)
Regulated industry	-0.020	-0.015	-0.15	-0.017	-0.019	-0.008	-0.007	-0.006	-0.008	-0.006
	(-0.92)	(-0.82)	(-0.76)	(-0.88)	(-0.95)	(-1.03)	(-0.95)	(-0.79)	(-1.15)	(-0.71)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald's χ^2	34.33*	47.11***	35.44*	39.31**	70.13***	39.47**	37.69**	46.17***	34.44*	36.84*
M^2	-1.55	-0.58	-0.56	-0.65	-0.76	0.03	0.02	-0.02	0.01	0.05
	(0.120)	(0.461)	(0.576)	(0.514)	(0.449)	(0.972)	(0.984)	(0.984)	(0.992)	(0.961)
Hansen	85.68	82.63	86.05	88.66	86.28	80.65	82.40	81.73	83.40	88.80
	(0.369)	(0.338)	(0.330)	(0.263)	(0.323)	(0.522)	(0.345)	(0.456)	(0.367)	(0.259)
N observations	1,205	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089
N firms	116	116	116	116	116	116	116	116	116	116

Models are estimated using Generalize Method of Moments (GMM). Values are unstandardized coefficients, with z values in parentheses. Wald's χ^2 is a test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as χ^2 under the null hypothesis of no relationship for all explanatory variables. 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 with p values in parentheses. Hansen is a test of over-identifying restrictions, asymptotically distributed as χ^2 under the null hypothesis of no correlation between the instruments and the error term with p values in parenthese. Models are estimated with the constant; however, the constant is not reported in the table. * p < 0.10; **p < 0.05; *** p < 0.01

Figure 1: Pre-code and pre-soft quota appointed women directors

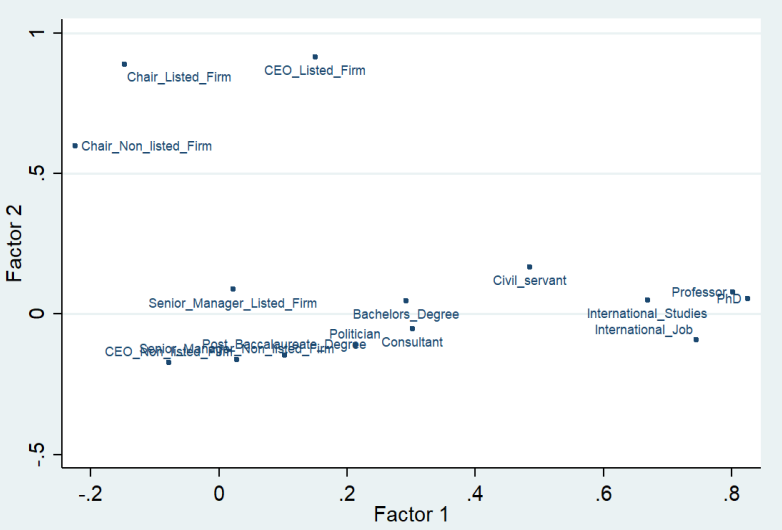


Figure 2: Post-code and post-soft quota appointed women directors

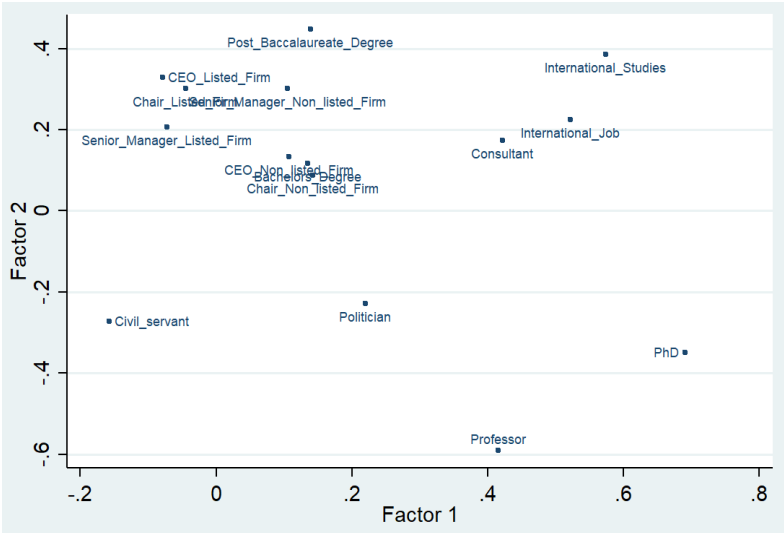


Figure 3: Pre-EU Directive proposal appointed women directors

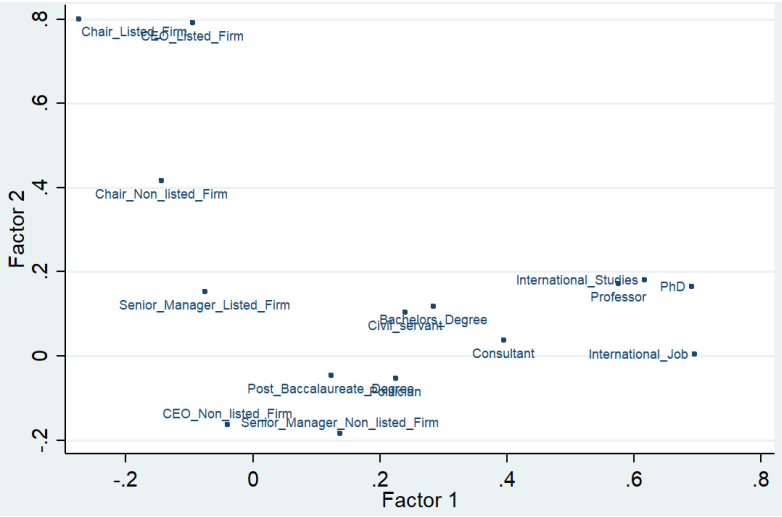


Figure 4: Post-EU Directive proposal appointed women directors

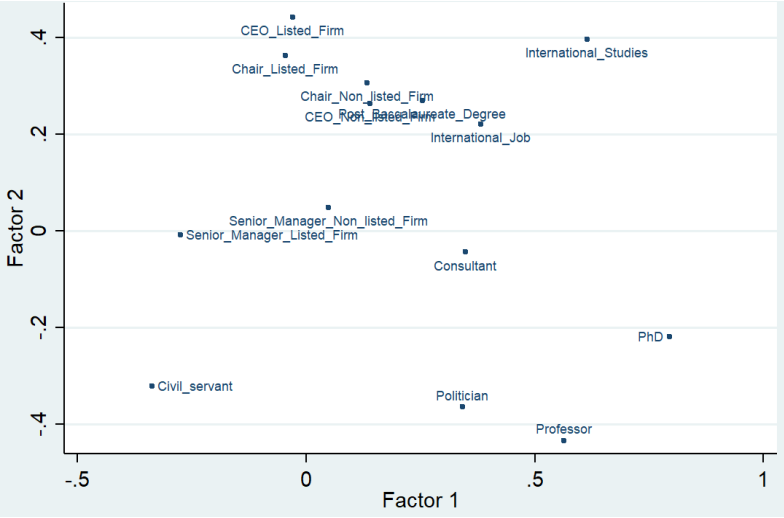


Figure 5: Pre-code and pre-soft quota appointed men directors

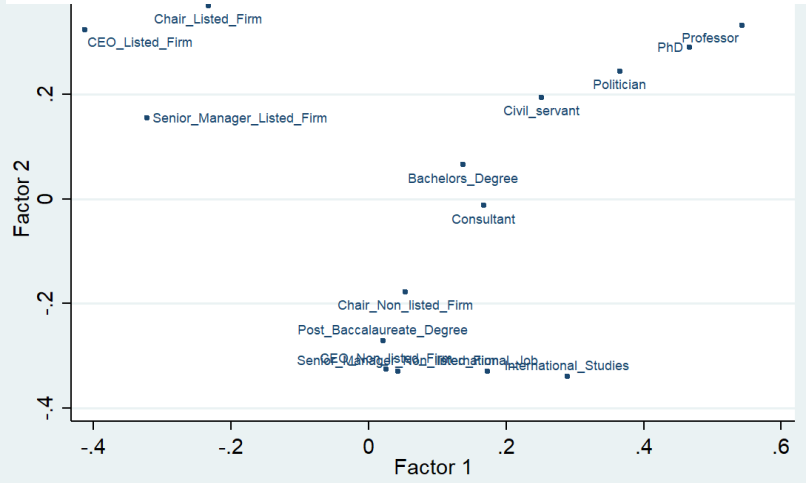


Figure 6: Post-code and post-soft quota appointed men directors

Figure 7: Pre-EU Directive quota appointed men directors

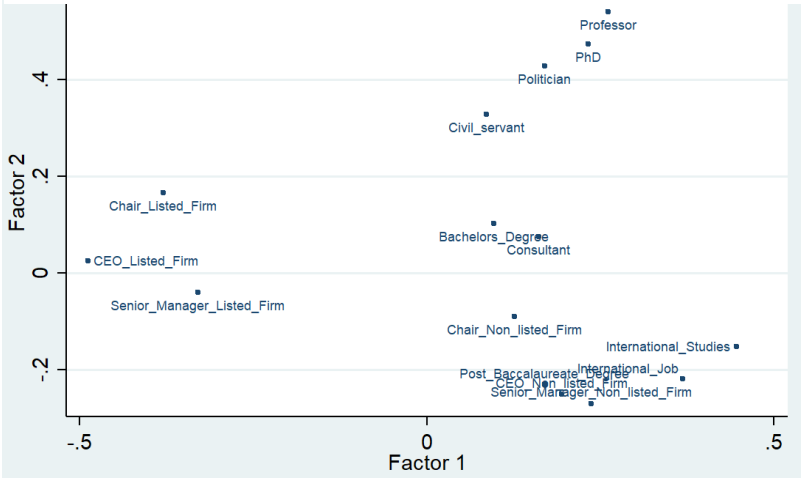
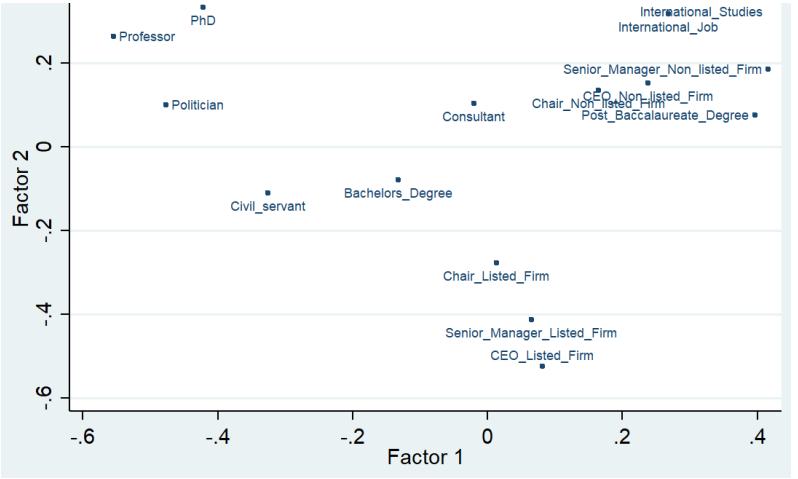


Figure 8: Post-EU Directive quota appointed men directors



Appendix Table 1: Previous research gender diversity on boards laws worldwide

Panel A: Hard law institutional contexts

Research	Country	Law	Research question	Results
Ahern and Dittmar (2012)	Norway	Hard quota (2003; 40%; de-listing)	Does the announcement of the hard quota impact on stock prices? How does the quota influence firm performance, other firm characteristics, and directors' attributes?	The quota announcement negatively impacts stock prices. The quota negatively impacts firm performance. The quota increases leverage and acquisitions and decreases operating performance, and leads to younger and less experienced boards.
Bertrand, Black, Jensen, and Lleras-Muney (2014)	Norway	Hard quota (2003; 40%; de-listing)	Does the hard quota influences directors' attributes, gender wage gap, female representation in top positions and female attitudes (education, fertility, and marital plans)?	The quota has a positive impact of women's educational attainment. There is no significant change in the gender wage gaps, female representation in top positions, and female decisions regarding education, fertility, and marital plans.
Bøhren and Staubo (2014)	Norway	Hard quota (2003; 40%; de-listing)	What are the costs of compliance with a hard quota? Are costs associated with firm characteristics?	Mandatory gender balance generates inefficient organization forms and/or inefficient boards. Cost are firm-specific, and are associated with firm size, age, ownership, and board structure.
Bøhren and Staubo (2015)	Norway	Hard quota (2003; 40%; de-listing)	Does the hard quota influence board composition and firm value?	The quota positively impacts the percentage of independent directors, but negatively impacts firm value.
Casey, Skibnes, and Pringle (2011)	Norway	Hard quota (2003; 40%; de-listing)	Do women's perceptions and experiences of corporate governance participation differ in Norway and New Zealand (without board gender diversity regulation)?	Hard law is more effective than other gender related legislation in advancing gender. The Norwegian case ignores complex and subtle dimensions of gender experiences. The New Zealand case displays the merit of popular democratization and subsidiary of responsibility.
Dale-Olsen, Schøne, and Verner (2012)	Norway	Hard quota (2003; 40%; de-listing)	Does board gender diversity influence firm performance? Is the relationship between gender diversity and performance different in Norway compared to Denmark (no board gender diversity regulation)?	There is no relationship between gender diversity on boards and performance in Denmark. In Norway, there is a positive relationship between gender diversity and performance, but the short-term relationship between gender diversity and performance is negligible.
Dale-Olsen, Schøne, and Verner (2013)	Norway	Hard quota (2003; 40%; de-listing)	Does the hard quota influence firm performance?	The impact of quota on firm performance is negligible.
Eckbo, Nygaard, and Thorburn (2016)	Norway	Hard quota (2003; 40%; de-listing)	Does the hard quota influence firm value?	The impact of quota on firm value is negligible.
Ferrari, Ferraro, Profeta, and Pronzato (2018)	Italy	Hard quota (2011; 33%; fines)	Does the hard quota and board gender diversity influence directors' characteristics (age, number of directorships, and education), firm performance, and stock market prices?	Gender diversity on boards is associated with higher levels of education (for men and women) and lower share of elderly members. The increase of women directors does not influence firm performance whereas women's presence on boards is associated with lower variability of stock market prices. The announcement of legislation does not impact stock prices, but the announcements of women

Panel A: Hard law institutional contexts				
Research	Country	Law	Research question	Results
				directors' appointments positively impact stock market prices.
Kogut, Colomer, and Belinky (2014)	Norway	Hard quota (2003; 40%; de-listing)	Does the hard quota influence women directors' networks?	A hard quota generates well-connected networks of women directors who attain equality in their centrality and influence.
Matsa and Miller (2013)	Norway	Hard quota (2003; 40%; de-listing)	Does the Norwegian quota affect corporate decisions?	Firms affected by the quota increase labour cost and employment level, and reduce short-term profits. The effects are stronger among firms without female directors before the quota.
Rebérioux and Roudaut (2016)	France	Hard quota (2011; 40%; nullification of elections and suspension of compensation)	How does the hard quota influence women's presence on boards, including key positions?	The quota increases women's presence on boards, but female new directors are less likely than male directors to hold key positions (i.e., member and chair in audit, compensation, and nomination committees)
Seierstad and Opshal (2011)	Norway	Hard quota (2003; 40%; de-listing)	How does the influence of hard quota on gender bias, the emergence and gender of prominent directors, and directors' social capital?	The quota increases the pool of women directors, and creates a small elite network of women directors who rank among the top on a number of proxies of influence.
Solimene, Coluccia, and Fontana (2017)	Italy	Hard quota (2011; 33%; fines)	Does the hard quota influence women's presence on boards and directors' attributes?	The Italian hard quota influences director composition. New female directors are Italian, have high levels of education, and are more likely to be professionals with experience.
Wang and Kelan (2013)	Norway	Hard quota (2003; 40%; de-listing)	Does the hard quota, the presence of women directors, firms' board structure, and directors' characteristics influence women appointments to Chair and CEO positions?	The presence of female Chairs is positively related to female directors' independence status, age, and qualifications. The presence of female CEOs is positively associated with the percentage of independent directors and directors' qualifications. Differences between women and men directors' qualifications, board interlocks, and nationality disappear after quota full compliance.

Appendix Table 1 (continued): Previous research on gender diversity on boards laws worldwide

Panel B: Code and soft-quota institutional context*

Research	Country	Law	Research question	Results
Hinnerich and Jansson (2017)	Sweden	Threat of quota legislation (2006)	Does the threat of quota increase gender diversity? Does board gender diversity influence firm performance?	The threat increased female representation on boards. This increase was accompanied by an increase in firm performance which is related to higher sales and lower labour costs.
Willey (2017)	Canada	Soft law (code; 2014)	Is soft legislation effective in increasing gender diversity on boards?	The code recommendations on gender diversity on boards have not led to a significantly higher share of female directors.

Panel C: Code and soft and hard law institutional contexts

Research	Country	Law	Research question	Results
Comi, Grasseni, Origo, and Pagani (2020)	Belgium, France, Italy, and Spain	Hard (Belgium, French, and Italian) and soft (Spanish) quotas.	Do board gender quotas on influence firm outcomes?	The French quota negatively influences profitability and productivity, but positively influences the number of employees. The Italian quota has a positive effect on firm outcomes. The Spanish and Belgium quotas do not influence firm outcomes.
Labelle, Francouer, and Lakhal (2015)	17 countries	Regulation (hard and soft) vs no regulation	Does board gender diversity on boards influence firm performance? Does the relationship between gender diversity and performance vary with the presence of regulation?	Gender diversity on boards positively impacts firm performance under institutional contexts without regulation, but negatively influences firm performance under regulation.
Lending and Vähämaa (2017)	Europe	Hard and soft quotas	Do gender quotas and gender diversity influence board independence and directors' expertise?	Hard quotas increase female representation and board independence. Soft quotas are associated with greater female representation. Female representation is positively associated with board expertise, but a soft gender quota decreases this relationship.
Sojo, Wood, Wood, and Wheeler (2016)	91 countries	Hard quotas, soft quotas, and codes	Do reporting requirements, soft quotas, and hard quotas increase gender diversity?	Hard and soft quotas increase female representation on boards. Codes do not significantly impact gender diversity on boards.

* Gabaldón and Giménez (2016) de Cabo, Escot, and Gimeno (2011); de Cabo et al. (2019) Palá-Laguna and Esteban-Salvador (2016); Reguera-Alvarado, De Fuentes, and Laffarga (2017) address Spanish soft law, and are included in italics in Table 3.

Appendix Table 2: Previous research on gender diversity on boards in Spain

Research	Sample	Research question	Gender laws	Results
Baixauli-Soler, Lucas-Pérez, Martín-Ugedo, Mínguez-Vera, and Sánchez-Marín (2016)	Spanish listed firms in 2004-2011	Does board gender diversity influence firm remuneration policy?	No	Presence of independent women directors positively influences the proportion of variable pay in the compensation of executive directors. There is a negative moderating effect of ownership concentration.
Campbell and Mínguez-Vera (2008)	Spanish listed firms in 1995-2000	Does gender diversity on boards influence firm performance?	No	Gender diversity on boards positively impacts firm performance.
Campbell and Mínguez-Vera (2010)	Spanish listed firms in 1989-2001	Do markets react to female directors' appointments? How does board gender diversity influence firm performance?	No	Stock market reacts positively in the short term to the announcement of female board appointments. Female board appointments are positively associated with firm value over a sustained period.
De Anca and Gabaldón (2014)	IBEX-35 firms in 2007-2010	Do media react to female directors appointments?	No	The difference in press visibility of the appointing of female versus male directors is negligible. There is high visibility of the appointments of executive directors and only one woman was appointed as an executive director in the study period.
de Cabo, Gimeno, and Escot (2011)	Spanish listed and non-listed firms in 2005-2008	What determines women's presence on boards?	Yes	Women directors are scarcer in sectors with fewer female managers. Time, competition, and contagion seem favor the appointment of women directors. There is a positive relationship between the number of women already on the boards and the likelihood of adding a woman director.
de Cabo, Terjesen, Escot, and Gimeno (2019)	Spanish listed and no-listed firms in 2005-2014	Is soft legislation effective in increasing board gender diversity?	Yes	Only nine percent of targeted firms comply with the quota. Firms that depend on public contracts are more likely to increase female representation, but quota-compliant firms do not benefit from the quota incentive in terms of receiving more public contracts.
De Celis, Velasco-Balmaseda, De Bobadilla, Alonso-Almeida, and Intxaurburu-Clemente (2015)	Spanish firms signed up Women's Empowerment Principles (WEP) in 2011	Does board gender diversity influence firm CSR practices?	No	Female presence in board directorships and management positions positively influences CSR activities with gender equality objectives.
Gabaldón and Giménez (2016)	IBEX-35 firms in 2004-2016	Is soft legislation effective in increasing board gender diversity?	Yes	Spanish soft law increases women representation on IBEX-35 boards, although the desired targets are not reached.
García-Izquierdo, Fernández-Méndez, and Arrondo-García (2018)	Spanish listed firms in 2011-2015	Does board gender diversity influence firm remuneration policy?	No	Women in remuneration committees negatively influence CEO pay and CEO pay growth. Women in remuneration committees are associated with a lower number of votes in terms of directors' remuneration reports and related policies.
Hernández-Nicolás,	Spanish small and	Does board gender diversity influence	No	There is a negative relationship between gender diversity on

Research	Sample	Research question	Gender laws	Results
Martín-Ugedo, and Mínguez-Vera (2015)	micro start-up firms in 2008	debt strategy?		boards and firm debt level, cost, and maturity. Women directors are more risk-averse compared to male directors.
Hernández-Nicolás, Martín-Ugedo, and Mínguez-Vera (2016)	Spanish cooperatives in 2010	Does board gender diversity influence firm performance and debt strategy?	No	Gender diversity on boards positively influences cooperative firms performance and negatively influences level of indebtedness.
López-Delgado and Diéguez-Soto (2018)	Spanish private firms in 2006-2013	Does board gender diversity influence firm debt strategy?	No	The presence of female directors negatively influences firms' indebtedness, and moderates the positive relationship between family management and indebtedness only with a critical mass of women directors.
Lucas-Pérez, Mínguez-Vera, Baixauli-Soler, Martín-Ugedo, and Sánchez-Marín (2015)	Spanish listed firms in 2004-2009	Does board gender diversity influence firm remuneration policy?	No	Gender diversity on boards increases the effectiveness of boards (composition, structure, size, and functioning) and influences the design of top managers' compensation.
Martín-Ugedo and Mínguez-Vera (2014)	Spanish SMEs in 2003-2008	What determines women's presence on boards?	No	Firm performance and family ownership positively influence gender diversity on boards. Corporate ownership and firm risk negatively influence gender diversity on boards.
Mínguez-Vera and López-Martínez (2010)	Spanish SMEs	Does board gender diversity influence firm performance?	No	Board gender diversity positively impacts firm performance. Firms with an individual as main shareholders, smaller firms, and firms with larger boards and less financial risk have more women on boards. A non-financial firm as the main shareholder is less likely to have women directors.
Mínguez-Vera and Martín (2011)	Spanish SMEs	Does board gender diversity influence firm performance? What determines women's presence on boards?	No	Gender diversity negatively impacts firm performance. Family firms, firms with a financial firm as main shareholder, with less debt, more assets, and larger boards have more women directors.
Palá-Laguna and Esteban-Salvador (2016)	IBEX-35 firms in 2007-2013	Is soft legislation effective in increasing gender diversity on boards?	Yes	Spanish soft law increases women representation on IBEX-35 boards, although the desired targets are not reached.
Palomo-Zurdo, Gutiérrez-Fernández, and Fernández-Torres (2017)	Spanish cooperative banks in 2000-2014	Does board gender diversity influence firm performance and debt strategy?	No	The presence of women directors positively influences firm performance and financial leverage.
Reguera-Alvarado, De Fuentes, and Laffarga (2017)	Spanish listed firms in 2005-2009	Is soft legislation effective in increasing gender diversity on boards? Does board gender diversity influence firm performance?	Yes	Board gender diversity increased after the approval of gender diversity legislation, and positively influences firm value.

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