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# Gender regulations on Boards of directors: The moderating role of the institutional environment

Irma Martínez García[1] and Silvia Gómez Ansón[2]

**Summary**

An analysis was made of a group of companies belonging to the STOXX Europe 600 index for the period 2004-2018 of how regulations on gender diversity on Boards of directors influence the presence of women on Boards of directors and Board committees, and how formal and informal institutional factors moderate the relationship between regulations and the presence of women on Boards of directors and Board committees. The results show that the presence of women on Boards of directors and their committees is greater in countries that have introduced gender regulation (recommendations in corporate governance codes and quotas), although quotas that are not subject to sanctions do not seem to have a significant influence. Formal and informal institutional factors moderate the relationship between regulations and the presence of women on Boards of directors and Board committees. The effectiveness of gender diversity regulations increases in countries with high levels of power distance, individualism, uncertainty avoidance and short-term orientation, but is lower in countries with high quality of governance and a relatively large presence of women in decision-making bodies. Differences are also observed in the influence of the institutional environment as a moderator of the relationship between regulations and the presence of female directors and between regulations and the presence of women on committees.

*Key words:* Corporate governance, female directors, gender diversity, hard quotas, soft quotas, soft regulations, institutional

*JEL classification:* G30; G38; J70; M14

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1 Comisión Nacional del Mercado de Valores, Calle Edison 4, Madrid, 28006, Spain. Tel.: +34915851500. E-mail: irma.martinez@cnmv.es

2 University of Oviedo, Avenida del Cristo s/n, Oviedo, 33006, Spain. Tel.: +34985102825. E-mail: sgomez@uniovi.es

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# 1 Introduction

On an international level, women are underrepresented on Boards of directors (Dawson et al., 2016) and this has attracted attention and given rise to debate in academic, political and social circles. It has prompted several countries to adopt strategies to increase the presence of women on the Boards of directors of their companies through regulations based on the "comply or explain" principle in corporate governance codes and/or through the implementation of quota legislation, with or without sanctions in the event of non-compliance, which establish percentage thresholds for female representation on Boards of directors (Gómez-Ansón, 2012; Terjesen et al., 2015). Earlier academic literature focused on analysing the consequences of gender diversity on Boards of directors on business decisions and results and, to some extent, the implications of gender diversity recommendations in corporate governance codes (Chapple and Humphrey, 2014; Willey, 2017), of gender quotas without sanctions, or soft quotas (Gabaldon and Giménez, 2017; Mateos de Cabo et al., 2019; Palá-Laguna and Esteban-Salvador, 2016; Shan et al., 2018; Srivastava et al., 2018) and, more broadly, of gender quotas with sanctions, or hard quotas, especially in Norway (Ahern and Dittmar, 2012; Bertrand et al., 2014; Bøhren and Staubo, 2014, 2015; Casey et al., 2011; Dale-Olsen et al., 2012, 2013; Eckbo et al., 2016; Kogut et al., 2014; Matsa and Miller, 2013; Seierstad and Opshal, 2011; Wang and Kelan, 2013) and, to a lesser extent, in Italy (Ferrari et al., 2016; Solimene et al., 2017) and France (Rebérioux and Roudaut, 2016). However, there are few articles that look at the consequences of gender diversity regulation on Boards of directors from a multi-country perspective: Commi et al. (2017) study the impact on business results of the hard quotas implemented in Belgium, France and Italy, and of the soft quota approved in Spain; Labelle et al. (2015) analyse the relationship between gender diversity on Boards of directors and business performance for a sample of companies from 17 countries around the world; Lending and Vähämaa (2017) study the impact of soft and hard quotas on the independence of the Board of directors and the experience of the directors for a sample of European countries, while Sojo et al. (2016) address the effects of the different types of gender diversity regulations on the presence of female directors in companies from 91 countries around the world.

One of the most frequently used explanations as to why women are underrepresented on Boards of directors is that there are not enough women who are sufficiently qualified to be directors, which creates stereotypes and blinkered attitudes towards gender roles. The institutional environment of a country can reduce or enhance gender roles and stereotypes (Chizema et al., 2015) and, therefore, influence the presence of women on Boards of directors and gender diversity regulation, as well as the effectiveness of the regulation itself. Previous studies have looked at the impact of institutional factors on the presence of women on Boards of directors (Cabeza-García et al., 2019; Carrasco et al., 2015) and on the regulation of gender diversity: Terjesen et al. (2015) propose, from a theoretical point of view, three key

institutional factors for the establishment of gender quotas; Seierstad et al. (2017) explore the role of the processes and actors that drive the regulation of gender diversity in four European countries, Martínez-García (2019) studies the institutional background that would explain the different types of gender diversity regulation for a sample of 31 European countries and Iannotta et al. (2016) analyse the complementarities between the regulation of gender quotas and other institutional factors that determine gender diversity on Boards of directors in the EU-28.

The purpose of this work is to contribute to this line of research by studying the possible moderating effect of the institutional environment on the effectiveness of gender regulations aimed at increasing the presence of women on Boards of directors. Specifically, it analyses how the different regulations governing gender diversity on Boards (corporate governance codes with recommendations on gender diversity, gender quotas without sanctions, or soft quotas, and gender quotas with sanctions, or hard quotas) increase the presence of women on Boards of directors and Board committees, considering the potential moderating effect of the formal and informal institutional environment in the different countries, such as quality of governance, the presence of women in decision-making bodies and cultural dimensions.

The work establishes institutional theory as a framework and uses a group of companies belonging to the STOXX Europe 600 index for the period 2004-2018, in order to provide answers to the following research questions: Do the regulations that promote gender diversity on Boards of directors influence the presence of women on Boards of directors and Board committees? What type of gender diversity regulation is most effective for increasing the presence of women on Boards of directors and Board committees? Does the institutional environment (governance, presence of women in decision-making bodies and culture) influence the impact of gender diversity regulation on the presence of women on Boards of directors and Board committees? This article, therefore, responds to the need to analyse how the policies approved at country level explain differences in corporate governance (Aguilera and Jackson, 2003; Aguilera et al., 2018), and specifically, differences in the presence of women in corporate governance bodies (Grosvold et al., 2016; Terjesen et al., 2015).

The study contributes to existing literature in various aspects. First, it adopts a multicountry (or international) approach in its analysis of the impact of gender diversity regulation, as there have been few studies that have taken this cross-national approach (Chizema et al., 2015). Secondly, it analyses not only the impact of quotas with sanctions on the presence of women in corporate governance bodies, but also studies the effect of other types of gender diversity regulation, such as quotas without sanctions and recommendations in corporate governance codes, which makes it possible to compare the effectiveness of the different regulations. Thirdly, and unlike previous studies that focus on Boards of directors, this work also looks at other corporate bodies such as audit, nomination and remuneration committees. Lastly, the study considers the potential moderating impact of the institutional environment on the effectiveness of gender diversity regulation.

The rest of the article is structured as follows: Section 2 presents the theoretical framework and research hypotheses; Section 3 describes the database, variables and methodology employed in the study. The results are presented in Section 4, and Section 5 contains the conclusions, limitations and future lines of research.

# 2 Theoretical framework and research hypotheses

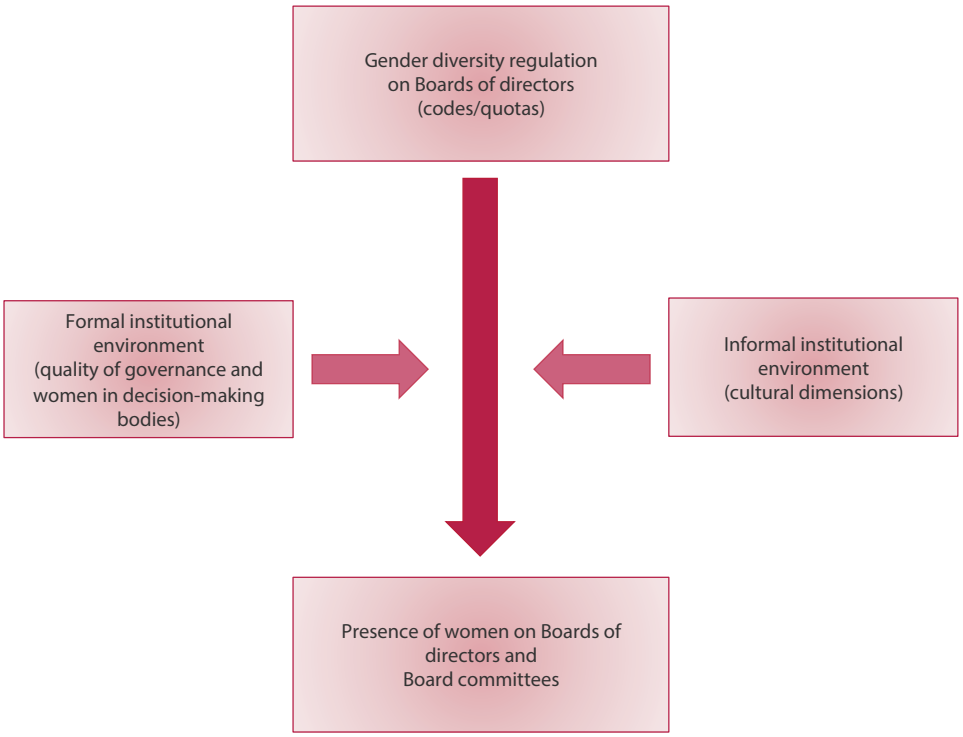
Gender diversity regulation on Boards of directors includes: i) recommendations on gender diversity contained in corporate governance codes that are based on the "comply or explain" principle, and ii) gender quota legislation that establishes a threshold for a balance between men and women. A distinction can be made between two types of quota: soft quotas, which do not entail sanctions in the event of non-compliance, and hard quotas, which establish sanctions in the event that companies do not comply with the gender percentage thresholds established. Of all geographical areas, this type of regulation is most widespread in Europe. 21 European countries have implemented strategies to seek to increase the presence of women on Boards of directors, either through recommendations in corporate governance codes or through quota legislation with or without sanctions (Martínez-García, 2019). Earlier academic literature has examined, at country level, the implications of gender diversity regulation on the composition of the Board of directors, especially the hard quotas implemented in Norway in 2003 (Bøhren and Staubo, 2015; Casey et al., 2011; Wang and Kelan, 2013, among others), but also the hard quotas approved in 2011 in Italy (Ferrari et al., 2016; Solimene et al., 2017) and France (Rebérioux and Roudaut, 2016). However, the effects of gender diversity recommendations in corporate governance codes have not been widely analysed, with the exception of studies performed in Canada (Willey, 2017) and Australia (Chapple and Humphrey, 2014). Studies on the implications of soft quotas are also limited, with the exception of some articles published in Spain (Gabaldon and Giménez, 2017; Mateos de Cabo et al., 2019; Palá-Laguna and Esteban-Salvador, 2016), Malaysia (Shan et al., 2018) and India (Srivastava et al., 2018). Other studies on gender regulations have focused on the importance of institutional factors in the establishment of these regulations, which seek to increase the presence of women on Boards of directors (Heidenreich, 2013; Seierstad et al., 2017; Teigen, 2012; Terjesen et al., 2015).

Countries have different institutional environments and this leads to differences in business practices (Aguilera and Jackson, 2003; Chizema and Shinozawa, 2012; Kostova, 1999). Previous research studies highlight the importance of institutional environments to explain the characteristics of corporate governance (Aguilera et al., 2018; Judge et al., 2008) and, specifically, of the presence of women on Boards of directors (Brieger et al., 2019; Chizema et al., 2015; Grosvold et al., 2016; Grosvold and Brammer, 2011; Santacreu-Vasut et al., 2014; Seierstad et al., 2017; Terjesen and Singh, 2008). Although most have focused on business-level factors (such as the features of the Board, ownership structure, size of the companies or the sector) as determinants of the presence of women on Boards of directors (Brammer et al., 2007; Grosvold, 2011; Grosvold et al., 2007, among others), some authors have examined how different factors at country level, such as the wage gap, the number of women in politics (Terjesen and Singh, 2008), religious beliefs (Chizema et al., 2015), language characteristics (Santacreu-Vasut et al., 2014) or family, educational,

economic and governmental institutions (Grosvold et al., 2016) can influence gender diversity on Boards. Therefore, previous literature shows that institutional theory is a suitable approach for examining gender diversity on Boards of directors.

Institutional theory describes how individuals and organisations develop and refine practices that *fit* their environment (Meyer and Rowan, 1977). In other words, it addresses how the cultural-cognitive, normative and regulatory structures that provide stability and meaning to social behaviour, and that operate at multiple levels of jurisdiction, shape the institutional environment (Grosvold, 2011). In this regard, Kostova (1999) proposes an explanation of how a country's institutional profile is configured. The institutional profile of a country includes "the set of all relevant institutions that have been established over time, that operate in that country, and that are transmitted into organizations through individuals" (Kostova, 1997: 180). This institutional profile must be understood through three components, namely: i) regulatory (laws and rules), ii) normative (attitudes, values and norms) and iii) cognitive (shared knowledge). These three components correspond to the three pillars established by Scott (1995), which can be classified into formal dimensions, such as laws, regulations and policies regarding work and family life, and informal dimensions such as norms, values and conventions (North, 1990; Scott, 2001). The study builds on institutional theory, which has been frequently used to explain the influence of institutions on corporate governance (Aguilera et al., 2018; Judge et al., 2008), to analyse the relationship between the regulation of gender diversity (codes and quotas) and the presence of women on Boards of directors and Board committees, considering the potential moderating effect of formal institutions (quality of governance and presence of women in decision-making bodies) and informal ones (culture). Figure 1 shows a summary of the theoretical model:

**Determinants of the presence of women on Boards of directors** FIGURE 1




Source: Compiled by the authors.

The study assumes that the regulation of gender diversity fulfils its purpose and will therefore increase the presence of women on Boards of directors and different Board committees. Further, it is assumed that the more binding the regulation, the greater its impact will be. Therefore, the following hypotheses are proposed:

**Hypothesis 1a:** The presence of women on Board of directors and Board committees is higher in countries that have regulations on gender diversity on Boards of directors (codes and quotas).

**Hypothesis 1b:** The presence of women on Boards of directors and Board committees is higher in countries that pass soft quota legislation than in countries that introduce recommendations in codes, and even higher in countries that have approved hard quotas.

The institutional environment and formal and informal institutional parameters can have a moderating effect on the relationship between gender diversity regulation and the presence of women on Boards of directors and Board committees. In regard to the formal institutional environment and its impact on female representation on Boards of directors, previous academic literature shows that countries with better governance have a greater number of women in parliament (Rosen, 2013) and that the quality and impartiality of governance, in addition to control over corruption, is associated with a higher percentage of women elected to public office (Sundström and Wängnerud, 2016). Furthermore, Grosvold (2011) indicates that the quality of governance has a positive influence on gender diversity on Boards of directors in 48 countries. Quality and transparency of governance also have an impact on the perception and belief that laws will be enforced, and increase public support for gender quota legislation (Barnes and Córdova, 2016). Therefore, the quality of governance at country level can be considered to play a moderating role. In Europe, the quality of governance is very uneven. Nordic countries are top of the governance quality ranking, followed by the central European and English-speaking countries, with southern and eastern European countries ranking last due to their poorer control of corruption and political stability, among other indicators (World Bank, 2020). Thus, considering that the quality of governance plays a moderating role in the relationship between gender diversity regulation and the presence of women on Boards of directors, the following hypothesis is proposed:

**Hypothesis 2:** The quality of governance positively moderates the relationship between gender diversity regulation and the presence of women on Boards of directors and Board committees.

Another formal institutional factor to consider is female representation in decision-making bodies at country level. The presence of women in politics not only encourages countries to adopt gender diversity regulation (Terjesen et al., 2015; Caul, 1999), but it is also key to breaking down gender stereotypes and changing the *status quo* (Chizema et al., 2015). Therefore, countries with more women in politics may not only be more likely to pass regulations to encourage gender diversity on Boards of directors, but they may also experience a greater impact of regulation on the presence of women on Boards of directors and Board committees. The presence of women in national parliaments is not uniform throughout Europe. Nordic countries have the highest percentages of women in parliament, followed by central European

countries, while English-speaking countries and countries in eastern and southern Europe have a smaller presence of women in their national parliaments (European Institute for Gender Equality, 2020). Considering the potential moderating effect of female representation in political office in the relationship between regulation and the presence of women on Boards of directors, the following hypothesis is proposed:

**Hypothesis 3:** The percentage of women in parliament positively moderates the relationship between gender diversity regulation and the presence of women on Boards of directors and Board committees.

The informal institutional environment contains normative and cognitive parameters, which include culture. Culture establishes the parameters under which countries operate and are programmed. Previous studies point out the importance of a country's culture on gender perception and the presence of women on Boards of directors (Cabeza-García et al., 2019; Grosvold, 2011; Parboteeah et al., 2008). European countries share a common cultural heritage but are by no means uniform. Geert Hofstede (1980; 2010) defined six specific cultural dimensions for the purpose of identifying the singularity of the informal environment in different countries, dimensions that have previously been considered in studies related to corporate governance and, specifically, to gender diversity on Boards of directors (Cabeza-García et al., 2019; Carrasco et al., 2015; Grosvold, 2011; Uribe-Bohorquez et al., 2019).

Hofstede's cultural dimension of *power distance* measures the extent to which a society accepts that power is distributed unequally in organisations and institutions. Countries with high values of power distance accept the unequal distribution of power and, therefore, the unequal representation of women with respect to men in high corporate office as a *normal* phenomenon, and this may result in gender diversity regulation having a decreased effect. In contrast, in countries where it is not generally accepted that power is unequally distributed, leaders adopt consultative practices with society, and society seeks a more equal distribution of power. Therefore, the impact of gender diversity regulation would be expected to be greater in countries where power distance is lower.

Hofstede's (1980) *individualism* dimension refers to the strength of the relationship between individuals and the social groups to which they belong. In other words, the extent to which individual consciousness and interest prevail over the collective interest. Citizens of a country with high scores in the individualism dimension tend to behave according to individualistic values, such as autonomy, privacy and the pursuit of personal goals, rather than seeking the interest of the group (loyalty to the group, engagement with norms and the search for social cohesion). In societies that pursue the collective interest, there is usually a greater sensitivity towards the representation of minority groups in decision-making bodies and, therefore, they can be expected to promote a balanced gender presence in corporate governance bodies. Therefore, the impact of gender diversity regulation would be expected to be greater in countries where individualism is lower.

The *masculinity* dimension defined by Hofstede measures the extent to which a society identifies with values that are traditionally associated with the male gender, such as heroism, assertiveness, success, competitiveness and material reward, or

with values associated with the female gender, such as cooperation, modesty, solidarity, caring for the weak and quality of life. The most feminine societies would be expected to prioritise support for groups experiencing inequality over business objectives and goals and, therefore, in these societies the impact of gender diversity regulation would be greater.

Hofstede's fourth dimension, *uncertainty avoidance*, refers to the extent to which members of a society are uncomfortable with uncertainty and ambiguity. Societies that tolerate uncertainty tend to be open to change, have a greater capacity to adapt to new realities, and are more tolerant of different opinions and behaviours. In contrast, societies with high levels of uncertainty avoidance tend to establish strict and clearly defined norms, rules and procedures in order to reduce levels of ambiguity and avoid dealing with unfamiliar situations. These societies do not tend to feel comfortable with change and are unlikely to easily accept new concepts such as gender diversity regulation and a greater presence of women in corporate bodies. Therefore, the impact of gender diversity regulation would be expected to be greater in countries where uncertainty avoidance is lower.

The *long-term orientation* dimension refers to extent to which societies prefer modernity and development over the desire to maintain traditions. Societies with long-term orientation tend to be more open to change and willing to make sacrifices in the present for the sake of future gains, particularly in relation to traditional values, such as conventional gender roles. Therefore, the impact of gender diversity regulation would be expected to be greater in countries with long-term orientation.

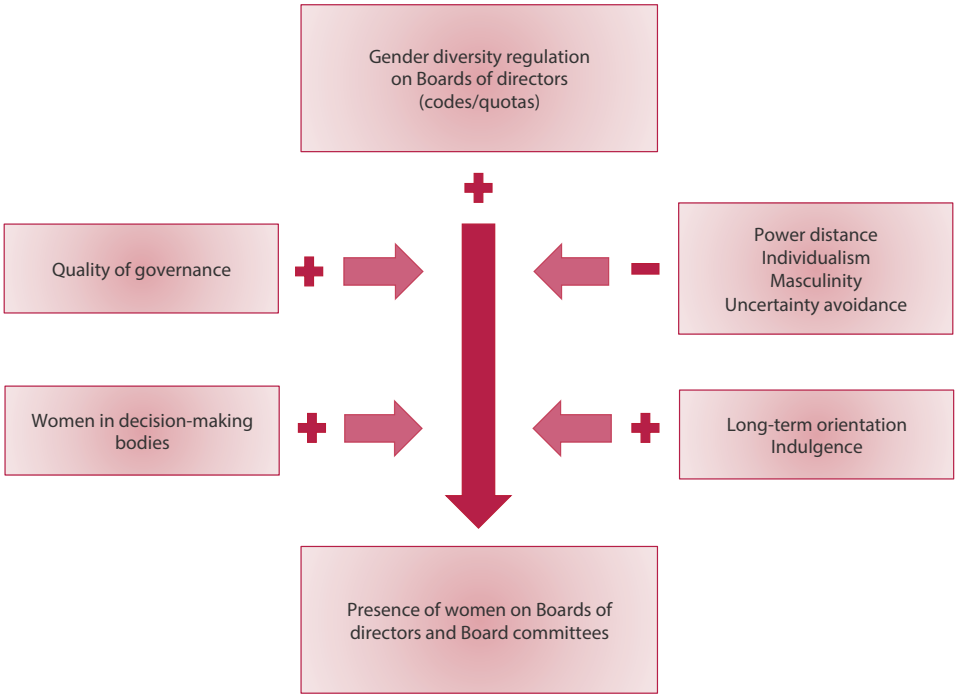
Lastly, the *indulgence* dimension refers to the extent to which individuals in a society are guided by their desires and impulses as opposed to being governed by strict norms and values. Societies with low levels of indulgence tend to abide by strictly prescribed gender roles (at work and at home) and strict sexual norms, and are more concerned with maintaining order in society than advocating freedom of expression. Therefore, the impact of gender diversity regulation would be expected to be greater in more indulgent countries.

Based on these arguments, the following hypothesis is proposed:

**Hypothesis 4:** The cultural dimensions of power distance, individualism, masculinity and uncertainty avoidance negatively moderate the relationship between gender diversity regulation and the presence of women on Boards of directors and Board committees, while the long-term orientation and indulgence dimensions positively moderate this relationship.

These research hypotheses are summarised in Figure 2:

**Determinants of the presence of women on Boards of directors: hypothesis** FIGURE 2




Source: Compiled by the authors.

# 3 Database, variables and methodology

## 3.1 Sample and database

The initial sample is a panel made up of all companies (financial and non-financial) of the STOXX Europe 600 index in 2018 for the period 2004-2018. The STOXX Europe 600 has a fixed number of 600 components and in 2018 comprised small, medium and large cap companies from 17 European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

From this initial sample (600 companies and 7,790 observations), the observations corresponding to companies with a registered office in Bermuda (1 company / 15 observations), Cyprus (1 company / 8 observations), the Isle of Man (2 companies / 28 observations), Jersey (3 companies / 45 observations), Malta (1 company / 15 observations), Mexico (1 company / 11 observations) and South Africa (1 company / 15 observations) and companies / observations for which no data were found on the composition of the Boards of directors or financial information (45 observations) were excluded. Following the application of these filters, the definitive sample contains an unbalanced panel composed of 590 companies and 7,608 observations, as shown in Table 1.

**Description of the sample** TABLE 1

| Year | DE | AT | BE | DK | ES | FI | FR | IE | IT | LU | NO | NL | PT | GB | CZ | SE | CH | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2004 | 44 | 4 | 9 | 12 | 18 | 11 | 60 | 8 | 13 | 4 | 10 | 18 | 3 | 107 | 2 | 32 | 34 | 389 |
| 2005 | 48 | 6 | 11 | 17 | 18 | 15 | 68 | 8 | 14 | 4 | 10 | 21 | 3 | 112 | 2 | 33 | 37 | 427 |
| 2006 | 49 | 5 | 11 | 19 | 20 | 16 | 73 | 8 | 14 | 5 | 11 | 21 | 4 | 115 | 2 | 34 | 38 | 445 |
| 2007 | 51 | 6 | 11 | 19 | 20 | 16 | 78 | 10 | 17 | 5 | 11 | 21 | 4 | 121 | 2 | 34 | 38 | 464 |
| 2008 | 56 | 7 | 12 | 20 | 20 | 16 | 80 | 10 | 18 | 5 | 11 | 22 | 4 | 122 | 2 | 36 | 38 | 479 |
| 2009 | 58 | 7 | 12 | 20 | 20 | 16 | 80 | 10 | 19 | 5 | 12 | 23 | 4 | 124 | 2 | 36 | 42 | 490 |
| 2010 | 59 | 7 | 12 | 22 | 21 | 16 | 81 | 10 | 20 | 5 | 13 | 23 | 4 | 127 | 2 | 38 | 43 | 503 |
| 2011 | 59 | 7 | 12 | 22 | 22 | 16 | 81 | 10 | 20 | 5 | 13 | 23 | 4 | 129 | 2 | 38 | 45 | 508 |
| 2012 | 60 | 7 | 12 | 22 | 23 | 16 | 82 | 10 | 20 | 5 | 13 | 23 | 4 | 131 | 2 | 39 | 47 | 516 |
| 2013 | 65 | 7 | 12 | 22 | 23 | 16 | 82 | 10 | 21 | 5 | 13 | 23 | 4 | 135 | 2 | 39 | 49 | 528 |
| 2014 | 66 | 7 | 13 | 23 | 24 | 16 | 83 | 10 | 22 | 5 | 13 | 26 | 4 | 141 | 2 | 39 | 50 | 544 |
| 2015 | 71 | 7 | 13 | 23 | 26 | 16 | 85 | 11 | 22 | 7 | 13 | 28 | 4 | 144 | 2 | 40 | 52 | 564 |
| 2016 | 73 | 7 | 14 | 24 | 26 | 16 | 85 | 11 | 24 | 7 | 13 | 31 | 4 | 148 | 2 | 40 | 53 | 578 |
| 2017 | 75 | 7 | 14 | 24 | 26 | 16 | 85 | 12 | 26 | 7 | 13 | 31 | 4 | 150 | 2 | 41 | 53 | 586 |
| 2018 | 74 | 7 | 14 | 24 | 26 | 16 | 85 | 11 | 26 | 7 | 12 | 32 | 4 | 151 | 2 | 43 | 53 | 587 |
| N | 908 | 98 | 182 | 313 | 333 | 234 | 1,188 | 149 | 296 | 81 | 181 | 366 | 58 | 1,957 | 30 | 562 | 672 | 7,608 |
| % | 11.9 | 1.3 | 2.4 | 4.1 | 4.4 | 3.1 | 15.6 | 2 | 3.9 | 1.1 | 2.4 | 4.8 | 0.8 | 25.7 | 0.4 | 7.4 | 8.8 | 100 |

Source: Compiled by the authors.

In regard to the structure of the database, the United Kingdom has the highest representation in the sample (25.7%), followed by France (15.6%), Germany (11.9%), Switzerland (8.8%) and Sweden (7.4%). The representation of other countries in the sample is less than 5%: Netherlands (4.8%), Spain (4.4%), Denmark (4.1%), Italy (3.9%), Finland (3.1%), Belgium (2.4%), Norway (2.4%), Ireland (2%), Austria (1.3%), Luxembourg (1.1%), and Portugal and the Czech Republic (less than 1%).

The information required to estimate the variables used in the study was extracted manually from various sources. Data on the composition of the Boards of directors and Board committees come from the BoardEx database and companies' annual corporate governance reports, and the financial information is taken from Thomson Reuters Eikon and Datastream. Information on gender diversity regulation on Boards of directors derives from the European Corporate Governance Institute (2020), Mensi-Klarbach and Seierstad (2020), Swissinfo.ch (2019), and Terjesen et al. (2015). Lastly, the variables showing quality of governance and the presence of women in decision-making and cultural bodies were taken from the Worldwide Governance Indicators database of the World Bank (2020), the European Institute for Gender Equality (2020) and from Hofstede (2020) Insights, respectively.

### 3.2 Variables

Annex I contains definitions of the variables used in this study. The dependent variables are a set of variables referring to the percentage of women on the Boards of directors[1] and Board committees: *female directors*, *women on audit committees*, *women on nomination committees* and *women on remuneration committees*. Additionally, a *gender diversity index in committees* was estimated, which includes the presence of women on audit, nomination and remuneration committees as a whole. The *gender diversity index in committees* was estimated by performing a principal component analysis (eigenvalue = 1.82) reflecting a variability of 60.87%.[2]

Gender diversity regulation on Boards of directors varies considerably across Europe (see Table 2). Initially, two dummy variables were defined with a value equal to 1

1 Corporate governance systems vary among the countries included in the study, one of the main differences being the structure of the Board of directors. For example there are countries where Boards of directors have a one-tier structure combining the functions of management and supervision – i.e., a single Board formed by executive and non-executive directors – while others have a two-tier structure – i.e., a management Board consisting of executive directors and a supervisory Board consisting of non-executive directors. Countries where Boards of directors have a one-tier structure include: Denmark, Ireland, Italy, Norway, Spain, Sweden and the United Kingdom, while Germany and Austria have a two-tier structure. In the other countries in the study: (Belgium, Czech Republic, Finland, France, Luxembourg, the Netherlands, Portugal and Switzerland), companies can choose whether to opt for a Board with a one-tier or two-tier structure. To obtain consistency in the Boards of countries or companies with a two-tier Board structure, the executive Board and the supervisory Board have been considered as a single body.

2 Since the eigenvalue of the second component is equal to 0.74 and adds variability of 24.73% (combined variability of 85.60%), only the first component is selected. The eigenvectors between the *gender diversity index in committees* and the variables on the presence of women on committees are: *women on audit committees* (0.49), *women on nomination committees* (0.60) and *women on remuneration committees* (0.63).

when a regulatory initiative (either a corporate governance code with recommendations on gender diversity – *code* – or a gender quota with or without sanctions – *quota* –) is present in a given country and year, and zero otherwise. Two other dummy variables were defined to reflect the type of quota: gender quota without sanctions (*soft quota*) or gender quota with sanctions in the event of non-compliance (*hard quota*). In order to collect all gender regulations in a single variable and reflect how binding the regulations are, a categorical variable (*regulation*) was defined, which takes the value of 1 when a country only issues recommendations on gender diversity in corporate governance codes, a value of 2 when a country has established a gender quota without sanctions (either in isolation or in addition to a recommendation in a code) and a value of 3 when there is gender quota legislation with sanctions (in isolation or in addition to a recommendation in a code). The *regulation* variable has the value of zero when the country is not affected by any type of regulation.

The quality of governance is measured according to six continuous variables: i) the extent to which the exercise of public power for private gain is controlled (*control of corruption*); ii) the extent to which agents trust and abide by the rules of society (*rule of law*); iii) the government's ability to implement programmes and regulations that promote the development of the private sector (*regulatory quality*); iv) the quality of public services, state employees, the formulation of policies and the application of these policies, as well as the credibility of the national government's commitment to these policies (*government effectiveness*); v) the probability of political stability (*political stability*), and vi) the extent to which citizens are free to choose their public representatives and government and to exercise freedom of expression and association (*voice and accountability*). Given the large number of variables that measure the quality of governance, a principal component analysis (PCA) is used to construct a *governance quality index* (eigenvalue = 4.72), reflecting a variability of 78.64%.[3]

The presence of women in decision-making bodies is measured by the percentage of female members of parliament, both the upper and lower houses (*women in parliament*).

Culture is measured through the six cultural dimensions of Hofstede (1980, 2010): i) *distance to power*: degree to which less powerful members of a society accept and expect power to be unevenly distributed (high values: acceptance; low values: rejection); ii) *individualism*: degree to which members of a society identify themselves as individuals (high values: individualism) or as members of a group or collective (low values: collectivism); iii) *masculinity*: preferences for values such as heroism, assertiveness, success and material rewards (high values: masculinity) versus preferences for cooperation, modesty, caring for the weak and quality of life (low values: femininity); iv) *uncertainty avoidance:* degree to which the members of a society feel uncomfortable with uncertainty and ambiguity (high values: uncertainty avoidance; low values: tolerance to uncertainty); v) *long-term orientation*: the extent to which

3 Since the eigenvalue of the second component is equal to 0.70 and adds a variability of 11.73% (combined variability of 90.38%), only the first component is selected. The eigenvectors between *the governance quality index* and governance quality variables are: *Control of corruption* (0.44), *Rule of law* (0.43), *Regulatory quality* (0.39), *Government effectiveness* (0.43), *Political stability* (0.32) and *Voice and accountability* (0.42).

society is oriented towards future rewards, is more open to change and willing to make sacrifices in the present for the sake of future gains (high values: long-term orientation) versus societies with a high respect for traditions and a willingness to maintain them (low values: short-term orientation), and vi) *indulgence*: the extent to which societies are carried away by their desires and impulses (high values: indulgence) or are governed by strictly prescribed gender roles (at work and at home) and strict sexual norms and present a greater concern for maintaining order in the nation rather than freedom of expression (low values: restraint).

Lastly, various characteristics of the companies were included as control variables: the logarithm of the book value of total assets as a *proxy* variable of the size of the company (*assets*), the debt ratio (*leverage*), and total number of directors (*size of the Board*).

### 3.3 Methodology

Following the basic descriptive analysis, Mann-Whitney U tests are performed to analyse possible differences in the presence of women on the Board of directors and Board committees, taking into account the different features of the institutional environment.

To test the research hypotheses, the GMM estimator (Arellano and Bond, 1991) is applied, which allows controlling for two potential problems: unobservable heterogeneity (i.e., the particular behaviour, characteristics and specificities of each company) and endogeneity. The GMM model is estimated as follows:

$$Y_{it} = \beta_1 Y_{it-1} + \beta_2 X_{it} + \sum_{t=2004}^{2018} A_t + \sum_{j=1}^{16} S_{ij} + \sum_{k=1}^{17} P_{ik} + \varepsilon_{it}$$

where $Y_{it}$ is a vector of continuous dependent variables that reflects the presence of women on the company's Board of directors and Board committees *i* in year *t* (*female directors* and *gender diversity index in committees*). $X_{it}$ denotes the explanatory variables for the research hypotheses: gender diversity regulation (*code, quota, soft quota, hard quota and regulation*), *governance quality index, women in parliament;* Hofstede's cultural dimensions (*power distance, individualism, masculinity, uncertainty avoidance, long-term orientation* and *indulgence*), and the control variables (*assets*, *leverage* and *Board size*). $\sum_{t=2004}^{2018} A_t$ , $\sum_{j=1}^{16} S_{ij}$, and $\sum_{k=1}^{17} P_{ik}$ are a set of dummy variables that reflect the annual effects, sector and country, respectively. $\varepsilon_{it}$ is the random error term. The GMM estimator controls for endogeneity problems using as instruments, for variables that are not strictly exogenous, the lagged values of the independent variables included in the model, and for unobservable heterogeneity, breaking down the random error term into two parts: a combined effect that depends on the company and the period of time and an individual effect that reflects the features of the companies and remains constant over time. To test the validity of the GMM model specification, the $M_2$ test is used to check for the lack of second order serial correlation in the first-difference residuals, and the Hansen test of over-identifying restrictions to check for the absence of correlation between the instruments and the error term. Lastly, autocorrelation and heteroscedasticity issues are corrected using the finite sample-corrected two-step covariance matrix.

# 4 Results

## 4.1 Gender diversity regulation and descriptive analysis

Table 2 describes the gender diversity regulation on Boards of directors approved in the 17 countries in the sample.

**Gender diversity regulation on Boards of directors in STOXX Europe 600 countries (2018)** TABLE 2

| | Gender quotas | | | Corporate governance codes with recommendations on gender diversity | |
|---|---|---|---|---|---|
| Country | Year | % | Hard/ Soft | Year | Code |
| Germany | 2016 | 30% | Hard | 2010 | German Corporate Governance Code |
| Austria | 2017 | 30% | Hard | 2009 | Austrian Code of Corporate Governance |
| Belgium | 2011 | 33% | Hard | 2009 | The 2009 Belgian Code on Corporate Governance |
| Denmark | | No | | 2008 | Recommendations on Corporate Governance |
| Spain | 2007 | 40% | Soft | 2006 | Unified Good Governance Code |
| Finland | 2005 | 40% | Soft | 2008 | Finnish Corporate Governance Code |
| France | 2011 | 40% | Hard | 2010 | Recommendations on Corporate Governance |
| Ireland | | No | | 2012 | The UK Corporate Governance Code and the Irish Corporate Governance Annex |
| Italy | 2011 | 33% | Hard | 2018 | Corporate Governance Code |
| Luxembourg | | No | | 2009 | The Ten Principles of Corporate Governance of the Luxembourg Stock Exchange |
| Norway | 2003 | 40% | Hard | 2009 | The Norwegian Code of Practice for Corporate Governance |
| Netherlands | 2013 | 30% | Soft | 2008 | Dutch Corporate Governance Code |
| Portugal | 2017 | 33.3% | Hard | 2016 | Corporate Governance Code |
| United Kingdom | | No | | 2012 | The UK Corporate Governance Code |
| Czech R. | | No | | | No |
| Sweden | | No | | 2004 | Swedish Code of Corporate Governance: A Proposal by the Code Group |
| Switzerland | 2019 | 30/20% | Soft | 2014 | Swiss Code of Best Practice for Corporate Governance |

Source: Martínez-García and Gómez-Ansón (2020).

Only one of the countries represented in the sample, the Czech Republic, did not introduce regulations to promote gender diversity on Boards of directors during the study period. 16 of the 17 countries have introduced recommendations on

gender diversity in corporate governance codes: Sweden (2004), Spain (2006), Denmark (2008), Finland (2008), the Netherlands (2008), Austria (2009), Belgium (2009), Luxembourg (2009), Norway (2009), France (2010), Germany (2010), Ireland (2012), the United Kingdom (2012), Switzerland (2014), Portugal (2016) and Italy (2018). Additionally, 11 of these European countries have introduced quota legislation (hard or soft) to promote the presence of women on Boards of directors. Countries that have implemented soft quotas are Finland (2005), Spain (2007), the Netherlands (2013) and Switzerland (2019).[4] Meanwhile, the quotas approved in Norway (2003), Belgium (2011), France (2011), Italy (2011), Germany (2016), Austria (2017) and Portugal (2017) imply sanctions in the event of non-compliance (hard quotas).

In most countries, recommendations on gender diversity in corporate governance codes preceded the implementation of quota legislation: Spain (2006 versus 2007), Belgium (2009 versus 2011), the Netherlands (2008 versus 2013), France (2010 versus 2011), Germany (2010 versus 2016), Austria (2009 versus 2017), Portugal (2016 versus 2017) and Switzerland (2014 versus 2019). In contrast, quotas in Norway, Finland, and Italy (2003, 2005, and 2011, respectively) preceded recommendations on gender diversity on Boards of directors in corporate governance codes (2009, 2008, and 2018, respectively).

Table 3 shows the descriptive analysis. Panel A contains descriptions of the variables referring to the presence of women on Boards of directors and Board committees; Panel B describes the variables referring to gender diversity regulation on Boards of directors, and Panels C, D and E include the descriptive statistics of institutional variables: quality of governance, presence of women in decision-making bodies and cultural dimensions, respectively. Lastly, Panel F shows the descriptive statistics of the control variables.

The results in Panel A reveal that the percentage of *female directors* in the companies included in the sample is, on average, 17.54% and that the presence of women is higher in audit committees (19.33%), followed by remuneration committees (16.06%) and nomination committees (12.70%).

In general and in relation to gender diversity regulation on Boards of directors (Panel B), corporate governance *codes* that include recommendations on gender diversity are more common (61.04%) than quotas (27.55%). In regard to gender diversity quotas on Boards of directors, European countries opt more frequently for quotas with sanctions in case of non-compliance (hard quotas) than for quotas without sanctions (soft quotas) (18.13% versus 9.42%). The *regulation* variable (average 1.10) refers to how binding the regulations on gender diversity on Boards are.

4 Since the time period analysed in the study is 2004-2008, the quota approved in Switzerland in 2019 has not been included.

**Descriptive statistics** TABLE 3

**Panel A: Dependent variables**

| Variable | Average | SD | Min. | Median | Max. | N |
|---|---|---|---|---|---|---|
| Female directors | 17.54 | 13.42 | 0 | 16.67 | 66.67 | 7,608 |
| Women on audit committees | 19.33 | 22.17 | 0 | 16.67 | 100 | 7,533 |
| Women on nomination committees | 12.70 | 18.02 | 0 | 0 | 100 | 7,545 |
| Women on remuneration committees | 16.08 | 21.71 | 0 | 0 | 100 | 7,565 |

**Panel B: Gender diversity regulation**

| Variable | Average/ Frequency (a) | SD | Min. | Median | Max. | N |
|---|---|---|---|---|---|---|
| Code (a) | 61.04 | 0.49 | 0 | 1 | 1 | 7,608 |
| Quota (a) | 27.55 | 0.45 | 0 | 0 | 1 | 7,608 |
| Soft quota (a) | 9.42 | 0.29 | 0 | 0 | 1 | 7,608 |
| Hard quota (a) | 18.13 | 0.39 | 0 | 0 | 1 | 7,608 |
| Regulation | 1.10 | 1.08 | 0 | 1 | 3 | 7,608 |

**Panel C: Quality of governance**

| Variable | Average | SD | Min. | Median | Max. | N |
|---|---|---|---|---|---|---|
| Control of corruption | 1.71 | 0.48 | -0.03 | 1.81 | 2.47 | 7,608 |
| Rule of law | 1.64 | 0.34 | 0.25 | 1.71 | 2.10 | 7,608 |
| Regulatory quality | 1.55 | 0.30 | 0.63 | 1.65 | 2.05 | 7,608 |
| Government effectiveness | 1.61 | 0.35 | 0.20 | 1.63 | 2.35 | 7,608 |
| Political stability | 0.70 | 0.42 | -0.47 | 0.64 | 1.62 | 7,608 |
| Voice and accountability | 1.38 | 0.18 | 0.91 | 1.36 | 1.80 | 7,608 |

**Panel D: Women in decision-making bodies**

| Variable | Average | SD | Min. | Median | Max. | N |
|---|---|---|---|---|---|---|
| Women in parliament | 29.53 | 8.50 | 9.9 | 28.86 | 48.9 | 7,608 |

**Panel E: Culture**

| Variable | Average | SD | Min. | Median | Max. | N |
|---|---|---|---|---|---|---|
| Power distance | 41.23 | 14.61 | 11 | 35 | 68 | 7,608 |
| Individualism | 73.84 | 11.10 | 27 | 71 | 89 | 7,608 |
| Masculinity | 49.64 | 22.30 | 5 | 66 | 79 | 7,608 |
| Uncertainty avoidance | 56.26 | 21.93 | 23 | 58 | 99 | 7,608 |
| Long-term orientation | 58.83 | 14.64 | 24 | 53 | 83 | 7,608 |
| Indulgence | 58.33 | 13.42 | 29 | 66 | 78 | 7,608 |

**Panel F: Control variables**

| Variable | Average | SD | Min. | Median | Max. | N |
|---|---|---|---|---|---|---|
| Assets | 30.10 | 2.04 | 16.93 | 29.95 | 35.83 | 7,608 |
| Leverage | 0.66 | 0.21 | 0 | 0.65 | 5.11 | 7,608 |
| Size of the Board | 12.26 | 4.96 | 1 | 0 | 34 | 7,608 |

Source: Own calculations.

Panel C summarises the quality of governance variables with values ranging between -2.5 and 2.5. The *control of corruption* variable has an average value of 1.71 and the *rule of law* variable has an average value of 1.64, while *regulatory quality*

takes an average value of 1.55 and *government effectiveness* is 1.61 on average. The *political stability* variable presents the lowest value among the quality of governance variables (0.70), and the average value of *voice and accountability* is 1.38. Regarding the presence of women in decision-making bodies, Panel D shows that *women in parliament* vary between 9.9% and 48.9% and account for an average 29.53% of the members of national parliaments.

In relation to informal institutional variables (Panel E), Hofstede's cultural dimensions have average values ranging from 41.23 (*power distance*) to 73.84 (*individualism*). The *masculinity* dimension has an average value of 49.64 and *uncertainty avoidance* is 56.26, while the *long-term orientation* and *indulgence* dimensions have values close to 59 (58.83 and 58.33, respectively).

Lastly, Panel F shows the descriptive statistics of the control variables. On average, the logarithm of total *assets* has a value of 30.10, companies have a *leverage* ratio of 0.66 and the Boards of directors are made up of 12 members (*size of the Board*).

### 4.2 Bivariate analysis

Table 4 looks at the differences in averages of the variables that include the presence of women on Boards of directors and Board committees based on the type of regulation on gender diversity on Boards (Panel A), the quality of governance (Panel B), the presence of women in decision-making bodies (Panel C) and cultural variables (Panel D).

**Influence of gender diversity regulation and the institutional environment on the presence of women on Boards of directors and Board committees: bivariate analysis**

TABLE 4

**Panel A: Gender diversity regulation**

| | Code | | | Quota | | |
|---|---|---|---|---|---|---|
| | Yes | No | Mann- | Yes | No | Mann- |
| Variables | N = 4,644 | N = 2,964 | Whitney U | N = 2,096 | N = 5,512 | Whitney U |
| Female directors | 22.67 | 9.51 | 1,500*** | 26.17 | 14.26 | 779.09*** |
| Women on audit committees | 25.89 | 8.88 | 994.87*** | 27.49 | 16.20 | 292.08*** |
| Women on nomination committees | 16.28 | 7.03 | 347.29*** | 19.56 | 10.08 | 218.26*** |
| Women on remuneration committees | 20.58 | 9.55 | 512.47*** | 23.55 | 13.52 | 296.75*** |
| Gender diversity index in committees | 0.30 | -0.47 | 1,000*** | 0.57 | -0.14 | 301.90*** |

| | Soft quota | | | Hard quota | | |
|---|---|---|---|---|---|---|
| | Yes | No | Mann- | Yes | No | Mann- |
| Variables | N = 717 | N = 6,591 | Whitney U | N = 1,379 | N = 6,229 | Whitney U |
| Female directors | 19.51 | 17.34 | 8.16*** | 29.63 | 14.87 | 910.47*** |
| Women on audit committees | 24.64 | 18.77 | 48.43*** | 28.98 | 17.18 | 210.35*** |
| Women on nomination committees | 14.85 | 12.48 | 12.04*** | 22.01 | 10.63 | 209.31*** |
| Women on remuneration committees | 16.91 | 16.22 | 14.56*** | 27.00 | 13.91 | 290.86*** |
| Gender diversity index in committees | 0.24 | -0.03 | 46.98*** | 0.43 | -0.10 | 222.42*** |

| | Regulation | | | | |
|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | |
| Variables | N = 2,677 | N = 2,835 | N = 717 | N = 1,379 | Mann-Whitney U |
| Female directors | 7.91 | 20.26 | 19.51 | 29.63 | 4,200*** |
| Women on audit committees | 7.95 | 23.88 | 24.64 | 28.98 | 1,400*** |
| Women on nomination committees | 6.34 | 13.56 | 14.85 | 22.01 | 1,100*** |
| Women on remuneration committees | 7.85 | 18.88 | 16.91 | 27.00 | 1,200*** |
| Gender diversity index in committees | -0.52 | 0.21 | 0.24 | 0.43 | 5,400*** |

**Panel B: Quality of governance**

| | Control of corruption | | | Rule of law | | |
|---|---|---|---|---|---|---|
| | N > average | N < average | Mann- | N > Average | N < average | Mann- |
| Variables | N = 4,395 | N = 3,213 | Whitney U | N = 5.308 | N = 2.300 | Whitney U |
| Female directors | 18.45 | 16.30 | 66.95*** | 17.46 | 17.73 | 2.54 |
| Women on audit committees | 20.61 | 17.58 | 39.01*** | 19.98 | 17.83 | 42.32*** |
| Women on nomination committees | 10.74 | 15.36 | 146.49*** | 11.10 | 16.37 | 59.14*** |
| Women on remuneration committees | 15.52 | 17.33 | 43.99*** | 15.58 | 17.92 | 13.21*** |
| Gender diversity index in committees | 0.07 | -0.08 | 37.20*** | 0.03 | -0.07 | 38.73*** |

| | Regulatory quality | | | Government effectiveness | | |
|---|---|---|---|---|---|---|
| | N > average | N < average | Mann- | N > Average | N < average | Mann- |
| Variables | N = 5,130 | N = 2,478 | Whitney U | N = 3,827 | N = 3,781 | Whitney U |
| Female directors | 17.14 | 18.37 | 0.28 | 18.48 | 16.59 | 51.52*** |
| Women on audit committees | 19.87 | 18.20 | 37.33*** | 20.43 | 18.20 | 27.34*** |
| Women on nomination committees | 11.58 | 15.01 | 6.82** | 9.72 | 15.72 | 201.36*** |
| Women on remuneration committees | 15.56 | 17.78 | 3.97** | 15.07 | 17.51 | 35.27*** |
| Gender diversity index in committees | 0.03 | -0.05 | 34.89*** | 0.05 | -0.05 | 24.58*** |

**Influence of gender diversity regulation and the institutional environment on the presence of women on Boards of directors and Board committees: bivariate analysis (*continuation*)** TABLE 4

| | Political stability | | | Voice and accountability | | |
|---|---|---|---|---|---|---|
| | N > average | N < average | Mann- | N > Average | N < average | Mann- |
| **Variables** | **N = 3,636** | **N = 3,972** | **Whitney U** | **N = 3,188** | **N = 4,420** | **Whitney U** |
| Female directors | 17.06 | 17.99 | 20.41*** | 18.76 | 16.66 | 26.14*** |
| Women on audit committees | 17.70 | 20.80 | 40.87*** | 19.50 | 19.20 | 0.211 |
| Women on nomination committees | 7.47 | 17.42 | 714.87*** | 8.07 | 16.04 | 464.70*** |
| Women on remuneration committees | 12.05 | 20.17 | 443.89*** | 13.23 | 18.49 | 193.83*** |
| Gender diversity index in committees | -0.07 | 0.07 | 40.66*** | 0.01 | -0.01 | 0.28 |

**Panel C: Women in decision-making bodies**

| | Regulation | | |
|---|---|---|---|
| | N > average | N < average | |
| **Variables** | **N = 3,148** | **N = 4,460** | **Mann-Whitney U** |
| Female directors | 18.83 | 16.63 | 4.52** |
| Women on audit committees | 19.82 | 18.98 | 1.38 |
| Women on nomination committees | 8.91 | 15.34 | 417.58*** |
| Women on remuneration committees | 14.08 | 17.84 | 149.05*** |
| Gender diversity index in committees | 0.02 | -0.02 | 1.35 |

**Panel D: Culture**

| | Power distance | | | Individualism | | |
|---|---|---|---|---|---|---|
| | N > average | N < average | Mann- | N > Average | N < average | Mann- |
| **Variables** | **N = 2,087** | **N = 5,521** | **Whitney U** | **N = 3,102** | **N = 4,506** | **Whitney U** |
| Female directors | 18.53 | 17.17 | 1.17 | 16.04 | 18.58 | 6.82** |
| Women on audit committees | 18.47 | 19.65 | 26.94*** | 18.54 | 19.88 | 0.06 |
| Women on nomination committees | 16.96 | 11.08 | 61.27*** | 15.50 | 10.77 | 242.15*** |
| Women on remuneration committees | 18.66 | 15.39 | 24.22*** | 19.88 | 13.81 | 248.94*** |
| Gender diversity index in committees | -0.04 | 0.02 | 23.62*** | -0.04 | 0.03 | 0.73 |

| | Masculinity | | | Uncertainty avoidance | | |
|---|---|---|---|---|---|---|
| | N > average | N < average | Mann- | N > average | N < average | Mann- |
| **Variables** | **N = 4,359** | **N = 3,249** | **Whitney U** | **N = 4,080** | **N = 3,528** | **Whitney U** |
| Female directors | 14.60 | 21.48 | 222.57*** | 16.30 | 18.97 | 87.81*** |
| Women on audit committees | 16.17 | 23.53 | 111.05*** | 16.18 | 22.94 | 238.94*** |
| Women on nomination committees | 13.49 | 11.64 | 113.24** | 13.13 | 12.21 | 4.14** |
| Women on remuneration committees | 15.39 | 17.48 | 4.57** | 13.22 | 19.83 | 232.64*** |
| Gender diversity index in committees | -0.14 | 0.19 | 113.13*** | -0.14 | 0.16 | 222.07*** |

| | Long-term orientation | | | Indulgence | | |
|---|---|---|---|---|---|---|
| | N > average | N < average | Mann- | N > average | N < average | Mann- |
| **Variables** | **N = 3,821** | **N = 3,787** | **Whitney U** | **N = 4,117** | **N = 3,491** | **Whitney U** |
| Female directors | 15.98 | 19.12 | 88.70*** | 16.71 | 18.53 | 1.88 |
| Women on audit committees | 14.95 | 23.71 | 337.77*** | 19.94 | 18.59 | 36.12*** |
| Women on nomination committees | 13.62 | 11.78 | 0.31 | 11.96 | 13.58 | 1.96 |
| Women on remuneration committees | 13.52 | 19.05 | 232.64*** | 17.25 | 15.15 | 64.01*** |
| Gender diversity index in committees | -0.19 | 0.20 | 316.85*** | 0.03 | -0.03 | 28.16*** |

Source: Own calculations.

*p < 0.10; **p < 0.05; *** p < 0.01

The results shown in Panel A indicate that the percentage of women on Boards of directors and Board committees (female directors, women on audit committees, women on nomination committees, women on remuneration committees, and gender diversity index in committees) is greater when countries have implemented some type of regulation that promotes gender diversity on the Board of directors (code, quota, soft quota and hard quota). For example, when there is a corporate governance code with recommendations on gender diversity, female directors account for 22.67% of the Board of directors versus 9.51% when there is no code with gender recommendations.[5] Similarly, gender quotas on Boards (with or without sanctions for non-compliance) are linked to a higher percentage of female directors (26.17% versus 14.26%). These results appear to support hypothesis 1a. The *regulation* variable refers to how binding the regulations on gender diversity are. The presence of women on Boards of directors and Board committees is generally greater the more binding the regulations are. When countries have not introduced regulatory initiatives on gender diversity on Boards of directors (regulation = 0), female directors represent 7.91% of Board members, and when countries introduce gender recommendations only in corporate governance codes (regulation = 1), the presence of female directors increases to 20.26%. However, the percentage of female directors in countries that have implemented a soft quota (regulation = 2) is lower than when there are only recommendations in the codes (19.51% versus 20.26%), while in countries that have introduced gender quotas with sanctions, or hard quotas, on Boards of directors (regulation = 3), the percentage of female directors reaches its highest value: 29.63%). The same pattern is observed in remuneration committees: the percentage of women on remuneration committees stands at an average of 7.85% when there is no regulation on gender diversity on the Boards of directors, it increases to 18.88% when recommendations on gender diversity are included in corporate governance codes and falls to 16.91% in companies with soft quotas, compared with 27% on average in companies subject to hard quotas. In other committees (audit and nomination), and when the presence of women is analysed jointly for all committees (gender diversity index in committees), the results indicate that the more binding the regulations, the higher the presence of women in audit and nomination committees and the higher the gender diversity index in committees. Therefore, the results do not fully support hypothesis 1b in relation to the presence of female directors, since soft quotas are more binding than recommendations in codes, but they do support this hypothesis in relation to Board committees.

When the relationship between the quality of governance and the presence of women on Boards of directors and Board committees is considered, the results shown in Panel B indicate that the greater the *control of corruption*, *government effectiveness* and *voice and accountability,* the higher the percentage of *female directors*. However, there does not appear to be any link between the percentage of *female directors* and the degree to which agents trust and abide by the societal rules (*rule of law*) or with the government's ability to carry out programmes and regulations that promote private sector development (*regulatory quality*). Additionally, perceptions

5 It should be noted that the results relating to the recommendations included in corporate governance codes should be interpreted with caution, given that in the bivariate analysis the *code* variable reflects whether the country has implemented recommendations on gender diversity in its corporate governance codes. without considering whether the recommendations in the codes coexist with legislation on gender quotas.

about the probability of political instability (low values of *political stability*) are associated with a higher percentage of *female directors*. With the exception of *political stability* and *voice and accountability*, countries with a high quality of governance have a greater presence of *women on audit committees*. In contrast, low quality of governance values are associated with a greater presence of *women on nomination committees* and *women on remuneration committees*. When the presence of women on Board committees as a whole is assessed, the analysis reveals that higher levels of *control of corruption*, *rule of law*, *regulatory quality* and *government effectiveness* are associated with higher values in the *gender diversity index in committees,* while this index is negatively linked to *political stability* and does not seem to be related to freedoms of expression, association and media (*voice and accountability*).

In regard to the relationship between the presence of women in corporate governance and politics, as shown in Panel C, the percentage of *female directors* and *women on audit committees* and the *gender diversity index in committees* is higher in countries with a greater number of women in parliament although the differences are only statistically significant in the case of *female directors*. In contrast, a lower percentage of *women in parliament* is associated with a higher percentage of *women on nomination committees* and a greater presence of *women on remuneration committees*.

In terms of the relationship between the cultural environment and the presence of female directors (Panel D), the analysis indicates that companies in countries with lower levels of *individualism*, *masculinity*, *uncertainty avoidance*, *long-term orientation* and *indulgence* have a higher percentage of *female directors*. In countries with high levels of *power distance,* where citizens accept that power is unequally distributed, women have a greater presence on Boards of directors, although the differences are not statistically significant. Although differences are observed in the relationship between culture and the presence of women in audit, nomination and remuneration committees, when the *gender diversity index in committees* is considered, results indicate that this index is higher in countries with lower scores in the cultural dimensions of *power distance*, *masculinity*, *uncertainty avoidance* and *long-term orientation,* and higher scores in the cultural dimension *indulgence*. In summary, the presence of women on Boards of directors and Board committees is greater in cultures that are characterised by high levels of femininity, tolerance for uncertainty and short-term orientation. The percentage of female directors is higher in collectivist and restrained societies, while gender diversity in committees is higher in indulgent societies with little power distance. Lastly, there are no significant differences in the relationship between *female directors* and *power distance* or between the *index of gender diversity in committees* and *individualism*.

### 4.3 Influence of gender diversity regulation on the presence of women on Boards of directors and Board committees

First, the effectiveness of gender diversity regulation on Boards is analysed (recommendations on gender diversity in corporate governance codes, gender quotas with and without sanctions, soft quotas and hard quotas) with respect to increasing the presence of women on Boards of directors and Board committees. Table 5 shows the results of the analysis for the different dependent variables: *female directors* (Models 1A, 2A and 3A) and *gender diversity index in committees* (Models 1B, 2B and 3B).

**Influence of gender diversity regulation on the presence of women on Boards of directors and Board committees**

TABLE 5

| | Model 1A | Model 1B | Model 2A | Model 2B | Model 3A | Model 3B |
|---|---|---|---|---|---|---|
| Variables | Female directors | Gender diversity index in committees | Female directors | Gender diversity index in committees | Female directors | Gender diversity index in committees |
| Code | 0.837*** | 0.053** | 0.815*** | 0.054*** | | |
| | (3.33) | (2.51) | (3.25) | (2.68) | | |
| Quota | 1.778*** | 0.042* | | | | |
| | (4.94) | (1.87) | | | | |
| Soft quota | | | 0.131 | 0.045 | | |
| | | | (0.21) | (1.15) | | |
| Hard quota | | | 2.138*** | 0.038 | | |
| | | | (5.48) | (1.56) | | |
| Regulation | | | | | 1.060*** | 0.023** |
| | | | | | (7.26) | (2.25) |
| Assets | 0.204 | 0.003 | 0.195 | 0.003 | 0.195 | 0.001 |
| | (0.92) | (0.16) | (0.87) | (0.22) | (0.86) | (0.01) |
| Leverage | 0.351 | 0.028 | 0.361 | -0.001 | 0.321 | 0.020 |
| | (0.41) | (0.57) | (0.42) | (-0.02) | (0.37) | (0.41) |
| Size of the Board | 0.042 | 0.005 | 0.063 | 0.008 | 0.070 | 0.006 |
| | (0.61) | (0.80) | (0.90) | (1.50) | (1.01) | (1.03) |
| Country | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Wald | 31,713*** | 17,325*** | 90,728*** | 19,572*** | 89,155*** | 17,955*** |
| $M^2$ | 1.20 | 1.24 | 1.17 | 1.26 | 1.15 | 1.26 |
| Hansen | 298.74 | 253.54 | 300.60 | 314.23 | 296.69 | 286.04 |
| N observations | 7,016 | 6,930 | 7,016 | 6,930 | 7,016 | 6,930 |
| N companies | 586 | 586 | 586 | 586 | 586 | 586 |

Source: Own calculations. Models are estimated using the generalised method of moments (GMM). Values are non-standardised coefficients with *z* values in parentheses. Wald is the test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as $X^2$ under the null hypothesis of no relationship for all explanatory variables. $M^2$ is the second-order serial correlation test using residuals in first differences, asymptotically distributed as $N(0.1)$ under the null hypothesis of no serial correlation. Hansen is the test of over-identifying restrictions, asymptotically distributed as $X^2$ under the null hypothesis of no correlation between the instruments and the error term. Models are estimated with the constant and one lag of dependent variable; however, they are not reported in the table. * p < 0.10; **p < 0.05; *** p < 0.01

The results show that regulations that promote a greater presence of women on Boards of directors (either a *code* or a *quota*) increase gender diversity on Boards (Model 1A) and Board committees (Model 1B). They also show that the effect of the codes in increasing the presence of *female directors* is less significant than the effect of quotas, while codes have a greater effect than quotas in increasing the *gender diversity index in committees*. When the different types of gender quotas are taken into account (*soft* versus *hard*), the findings indicate that quotas with sanctions in the event of non-compliance (*hard quotas*) have a significant effect in increasing the percentage of *female directors* (Model 2A) but not the *gender diversity index in committees* (Model 2B). In contrast, quotas without sanctions (*soft quotas*) do not have a significant effect in increasing the presence of women on Boards of directors or Board committees (Models 2A and 2B). Lastly, in general terms, the results indicate that the more binding the gender diversity regulation, the greater the presence of women on Boards of directors (Model 3A) and Board committees (Model 3B). In

general, the results obtained appear to support hypotheses 1a and 1b, especially with regard to the effect of codes and quotas with sanctions on Boards of directors.

### 4.4 The role of the institutional environment in the relationship between gender diversity regulation and the presence of women on Boards of directors and Board committees

Table 6 shows the results obtained in the analysis of the moderating effect of the formal (Panel A) and informal (Panels B and C) institutional environment in the relationship between gender diversity regulation and the presence of women on Boards of directors and Board committees.

**Influence of gender diversity regulation and the institutional environment on the presence of women on Boards of directors and Board committees** TABLE 6

**Panel A: Quality of governance and women in decision-making bodies**

| | Model 1A | Model 1B | Model 2A | Model 2B |
|---|---|---|---|---|
| **Variables** | **Female directors** | **Gender diversity index in committees** | **Female directors** | **Gender diversity index in committees** |
| Regulation | 0.929*** | 0.035*** | 2.367*** | 0.073*** |
| | (5.74) | (2.97) | (5.44) | (3.49) |
| Governance quality index | -0.187 | -0.022 | | |
| | (-0.44) | (-0.61) | | |
| Regulation × Governance quality index | -0.187** | 0.013*** | | |
| | (-2.12) | (2.75) | | |
| Women in parliament | | | 0.124*** | 0.001 |
| | | | (4.21) | (0.32) |
| Regulation × Women in parliament | | | -0.048*** | -0.005*** |
| | | | (-3.30) | (-3.10) |
| Assets | 0.180 | 0.006 | 0.188 | 0.006 |
| | (0.86) | (0.39) | (0.90) | (0.42) |
| Leverage | 0.365 | -0.001 | 0.383 | 0.002 |
| | (0.44) | (-0.02) | (0.46) | (0.04) |
| Size of the Board | 0.082 | 0.007 | 0.064 | 0.007 |
| | (1.28) | (1.34) | (1.02) | (1.20) |
| Country | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes |
| Wald | 98,381*** | 19,381*** | 35,306*** | 15,846*** |
| $M^2$ | 1.15 | 1.26 | 1.15 | 1.33 |
| Hansen | 326.43 | 316.69 | 321.23 | 312.91 |
| N observations | 7,016 | 6,666 | 7,016 | 6,930 |
| N companies | 586 | 550 | 586 | 586 |

Source: Own calculations. Models are estimated using the generalised method of moments (GMM). Values are non-standardised coefficients with *z* values in parentheses. Wald is the test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as $X^2$ under the null hypothesis of no relationship for all explanatory variables. $M^2$ is the second-order serial correlation test using residuals in first differences, asymptotically distributed as $N(0.1)$ under the null hypothesis of no serial correlation. Hansen is the test of over-identifying restrictions, asymptotically distributed as $X^2$ under the null hypothesis of no correlation between the instruments and the error term. Models are estimated with the constant and one lag of dependent variable; however, they are not reported in the table. * $p < 0.10$; **$p < 0.05$; *** $p < 0.01$

The results show that the *government quality index* negatively moderates the positive influence of gender regulations on the presence of *female directors* (Panel A, Model 1A). Countries with higher quality of governance do not appear to have a greater presence of *female directors*, but as the quality of governance increases, the effectiveness of gender diversity regulation decreases. However, when the *gender diversity index in committees* is considered a dependent variable, results show the opposite effect (Panel A, Model 1B): as the quality of governance increases, the effect of *regulation* on the increase in gender diversity in committees is enhanced. The results support a moderating effect on the quality of governance, but it does not have the same sign when the presence of women on Boards (negative) and on Board committees (positive) is analysed, and therefore this does not fully support hypothesis 2.

Regarding the influence of the presence of women in national parliaments on the relationship between regulation and the presence of women on Boards of directors and Board committees (Panel A, Models 2A and 2B), the results support a moderating effect of the *women in parliament* variable, but this effect is negative, contrary to the findings of hypothesis 3. In other words, the positive effect of the *regulation* of gender diversity on the increase of the presence of women on Boards of directors (Model 2A) and Board committees (Model 2B) falls as the presence of women in parliament increases.

In regard to the moderating effect of culture, Panels B and C reveal rich empirical evidence. First, in contradiction to hypothesis 4, the results reveal that the impact of *regulation* on gender diversity is more powerful in increasing the presence of women on Boards of directors and Board committees in countries that have high values in the *power distance* (Panel B, Models 3A and 3B) and *uncertainty avoidance* (Panel C, Models 6A and 6B) dimensions, and low values in *long-term orientation* (Panel C, Models 7A and 7B). Additionally, some cultural dimensions (*individualism, masculinity* and *indulgence*) are found not to influence the relationship between *regulation* and the presence of women on the Boards of directors and Board committees in the same way. In fact, high levels of *individualism* strengthen the positive effect of *regulation* by increasing the percentage of *female directors* (Panel B, Model 4A) but do not influence the relationship between *regulation* and the *gender diversity index in committees* (Panel B, Model 4B). In contrast, *masculinity* (Panel B, Model 5A) and *indulgence* (Panel C, Model 8A) do not influence the effectiveness of *regulation* in increasing the percentage of *female directors* (although the models reveal a direct negative effect of *masculinity* and *indulgence* in the presence of *female directors*), but they do moderate the relationship between *regulation* and the *gender diversity index in committees*. Therefore, in countries with low levels of *masculinity* (Panel B, Model 5B) and high levels of *indulgence* (Panel C, Model 8B) the positive effect of *regulation* in increasing the presence of women on audit, nomination and remuneration committees is strengthened. In summary, while hypothesis 4 establishes a negative moderating effect for the cultural dimensions *power distance, individualism, masculinity* and *uncertainty avoidance* and a positive effect for the dimensions, *long-term orientation* and *indulgence*, the results only support hypothesis 4 in the *masculinity* and *indulgence* dimensions and for the presence of women on Board committees. In contrast, the moderating effects in the rest of the cultural dimensions present the opposite sign to that established in the research hypothesis.

**Influence of gender diversity regulation and the institutional environment on the presence of women on Boards of directors and Board committees (*continuation*)** TABLE 6

**Panel B: Culture I**

| | Model 3A | Model 3B | Model 4A | Model 4B | Model 5A | Model 6B |
|---|---|---|---|---|---|---|
| **Variables** | **Female directors** | **Gender diversity index in committees** | **Female directors** | **Gender diversity index in committees** | **Female directors** | **Gender diversity index in committees** |
| Regulation | -0.161 | -0.054** | -0.701 | 0.027 | 1.558*** | 0.112*** |
| | (-0.46) | (-2.06) | (-1.17) | (0.62) | (4.01) | (4.41) |
| Power distance | -0.118 | -0.005 | | | | |
| | (-1.38) | (-0.85) | | | | |
| Regulation × Power distance | 0.024*** | 0.001*** | | | | |
| | (3.88) | (3.22) | | | | |
| Individualism | | | -0.038 | -0.003 | | |
| | | | (-0.68) | (-0.65) | | |
| Regulation × Individualism | | | 0.024*** | -0.001 | | |
| | | | (2.88) | (-0.09) | | |
| Masculinity | | | | | -0.144 | -0.004 |
| | | | | | (-0.02) | (-0.79) |
| Regulation × Masculinity | | | | | -0.010 | -0.002*** |
| | | | | | (-1.58) | (-3.78) |
| Assets | 0.183 | 0.004 | 0.089 | -0.001 | 0.081 | 0.001 |
| | (0.87) | (0.25) | (0.56) | (-0.04) | (0.47) | (0.03) |
| Leverage | 0.348 | -0.001 | 0.106 | -0.001 | -0.004 | 0.017 |
| | (0.42) | (-0.02) | (0.14) | (-0.21) | (-0.001) | (0.36) |
| Size of the Board | 0.068 | 0.007 | 0.079 | 0.011** | 0.107* | 0.005 |
| | (1.07) | (1.25) | (1.25) | (2.13) | (1.70) | (0.97) |
| Country | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Wald | 102,770*** | 19,822*** | 118,086*** | 19,260*** | 104,940*** | 18,693*** |
| $M^2$ | 1.17 | 1.27 | 1.18 | 1.28 | 1.17 | 1.24 |
| Hansen | 327.50 | 316.29 | 465.80 | 345.30 | 443.55 | 287.77 |
| N observations | 7,016 | 6,930 | 7,016 | 6,930 | 7,016 | 6,930 |
| N companies | 586 | 586 | 586 | 586 | 586 | 586 |

Source: Own calculations. Models are estimated using the generalised method of moments (GMM). Values are non-standardised coefficients with *z* values in parentheses. Wald is the test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as $X^2$ under the null hypothesis of no relationship for all explanatory variables. $M^2$ is the second-order serial correlation test using residuals in first differences, asymptotically distributed as $N(0.1)$ under the null hypothesis of no serial correlation. Hansen is the test of over-identifying restrictions, asymptotically distributed as $X^2$ under the null hypothesis of no correlation between the instruments and the error term. Models are estimated with the constant and one lag of dependent variable; however, they are not reported in the table. * p < 0.10; **p < 0.05; *** p < 0.01

**Influence of gender diversity regulation and the institutional environment on the presence of women on Boards of directors and Board committees (*continuation*)** TABLE 6

**Panel C: Culture II**

| | Model 7A | Model 7B | Model 8A | Model 8B | Model 9A | Model 9B |
|---|---|---|---|---|---|---|
| **Variables** | **Female directors** | **Gender diversity index in committees** | **Female directors** | **Gender diversity index in committees** | **Female directors** | **Gender diversity index in committees** |
| Regulation | 0.090 | -0.040 | 2.259*** | 0.097*** | 0.889*** | -0.067** |
| | (0.19) | (-1.10) | (4.17) | (2.63) | (2.62) | (-2.43) |
| Uncertainty avoidance | -0.080 | -0.004 | | | | |
| | (-1.35) | (-0.92) | | | | |
| Regulation × Uncertainty avoidance | 0.013** | 0.001* | | | | |
| | (2.15) | (1.81) | | | | |
| Long-term orientation | | | -0.061 | -0.002 | | |
| | | | (-0.85) | (-0.39) | | |
| Regulation × Long-term orientation | | | -0.017** | -0.001* | | |
| | | | (-2.26) | (-2.17) | | |
| Indulgence | | | | | -0.282 | -0.001 |
| | | | | | (-0.01) | (-0.27) |
| Regulation × Indulgence | | | | | 0.003 | 0.002*** |
| | | | | | (0.42) | (3.32) |
| Assets | 0.187 | 0.004 | 0.191 | -0.001 | 0.129 | -0.001 |
| | (0.82) | (0.26) | (0.86) | (-0.03) | (0.75) | (-0.01) |
| Leverage | 0.318 | 0.001 | 0.286 | 0.018 | 0.016 | -0.009 |
| | (0.37) | (0.01) | (0.33) | (0.37) | (0.02) | (-0.23) |
| Size of the Board | 0.081 | 0.008 | 0.063 | 0.006 | 0.104* | 0.009* |
| | (1.16) | (1.51) | (0.92) | (1.13) | (1.64) | (1.75) |
| Country | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Wald | 89,253*** | 18,992*** | 91,463*** | 17,882*** | 103,092*** | 19,962*** |
| $M^2$ | 1.14 | 1.27 | 1.15 | 1.27 | 1.17 | 1.27 |
| Hansen | 297.95 | 316.99 | 295.44 | 288.34 | 400.11 | 386.49 |
| N observations | 7,016 | 6,930 | 7,016 | 6,930 | 7,016 | 6,930 |
| N companies | 586 | 586 | 586 | 586 | 586 | 586 |

Source: Own calculations. Models are estimated using the generalised method of moments (GMM). Values are non-standardised coefficients with *z* values in parentheses. Wald is the test of the joint significance of the reported coefficients of the explanatory variables, asymptotically distributed as $X^2$ under the null hypothesis of no relationship for all explanatory variables. $M^2$ is the second-order serial correlation test using residuals in first differences, asymptotically distributed as $N(0.1)$ under the null hypothesis of no serial correlation. Hansen is the test of over-identifying restrictions, asymptotically distributed as $X^2$ under the null hypothesis of no correlation between the instruments and the error term. Models are estimated with the constant and one lag of dependent variable; however, they are not reported in the table. * $p < 0.10$; **$p < 0.05$; *** $p < 0.01$

# 5 Conclusions, limitations and future lines of research

The study analyses the impact of corporate governance codes and quotas that promote gender diversity on Boards of directors on the presence of women on Boards of directors and Board committees in Europe. The results reveal that the presence of women on Boards of directors is higher in countries that have included gender recommendations in corporate governance codes and that have implemented quota legislation. However, when differentiating between *soft* quotas or quotas without sanctions, and *hard* quotas or quotas with sanctions, the findings show that soft quotas do not have a significant effect in increasing the presence of women on Boards. These findings differ from previous empirical evidence. Thus, Sojo et al. (2016) demonstrate that gender quotas, with and without sanctions, significantly increase the presence on women on Boards, while gender recommendations in codes do not have a significant effect on increasing gender diversity on Boards. The results also reveal that the influence of recommendations in the corporate governance codes is greater than the effect of quotas when it comes to increasing the presence of women on Board committees. Furthermore, the formal and informal institutional environment moderates the relationship between regulation on gender diversity and female representation on Boards of directors and Board committees. The effectiveness of gender regulation is lower in countries with a high quality of governance and a high presence of women in politics. Conversely, the effectiveness of the regulation is enhanced in countries with cultural characteristics such as high levels of power distance, individualism, uncertainty avoidance and short-term orientation. While the analysis of institutional theory and the institutional factors considered lead us to establish, from a theoretical point of view, that higher quality of governance, presence of women in decision-making bodies, greater indulgence and long-term orientation and lower power distance, individualism, masculinity and uncertainty avoidance would enhance the effect of gender diversity regulation, the results show, in general terms, the opposite effect to be true. In other words, the effect of more binding gender diversity regulation is increased in countries with weaker formal institutions, with a reduced presence of women in decision-making bodies, and with informal institutions characterised by greater tolerance for inequality, less concern for collective interest, great concern about uncertainty and respect for traditions. The analyses also indicate differences in the role that the institutional environment plays as a moderator of the relationship between gender diversity regulation and the presence of women as members of Boards of directors or Board committees. In general, the study provides rich empirical evidence about the importance of the formal and informal institutional environment in the effectiveness of gender diversity regulation.

This work has a number of limitations, which could be addressed in future research; among them the fact that only European companies are considered and, therefore,

the results cannot be extrapolated to other institutional settings, and there are institutional factors that have not been considered, such as those relating to the welfare state, the characteristics of the labour markets and education systems. In addition to the potential research topics associated with these limitations, there are other promising future lines of research. Future research could consider the potential effect of the ownership structure of companies, differentiating, for example, between family and non-family businesses. It would also be interesting to consider the impact of gender regulation and the moderating role of the institutional environment on other variables, for example on the types of female directors (executive and non-executive) or the educational and professional profiles of female directors.

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# Annex I

## Definition of study variables

TABLE 7

| Variables | Description |
|---|---|
| **Dependent variables** | |
| Female directors | Percentage of women on the Board of directors. |
| Women on audit committees | Percentage of women on audit committees. |
| Women on nomination committees | Percentage of women on nomination committees. |
| Women on remuneration committees | Percentage of women on remuneration committees. |
| Gender diversity index in committees | Index constructed using a principal component analysis (PCA) that includes the percentage of women on audit, nomination and remuneration committees. |
| **Gender diversity regulation** | |
| Code | Dummy variable that takes the value of 1 when the company is affected by a gender recommendation included in a corporate governance code and zero otherwise. |
| Quota | Dummy variable that takes the value of 1 when the company is affected by a gender quota (soft or hard) and zero otherwise. |
| Soft quota | Dummy variable that takes the value of 1 when the company is affected by a soft quota and zero otherwise. |
| Hard quota | Dummy variable that takes the value of 1 when the company is affected by a hard quota and zero otherwise. |
| Regulation | Categorical variable that takes the value of zero when the company is not affected by any type of gender regulation, 1 when it is exclusively affected by a gender recommendation included in a corporate governance code, 2 when it is affected by a soft quota and 3 when affected by a hard quota. |
| **Quality of governance** | |
| Control of corruption | Refers to the extent to which the exercise of public power for private gain is controlled. Range: -2.5 to 2.5. |
| Rule of law | Refers to the extent to which agents trust and abide by the rules of society. Range: -2.5 to 2.5. |
| Regulatory quality | Refers to the government's ability to carry out programmes and regulations that promote private sector development. Range: -2.5 to 2.5. |
| Government effectiveness | Refers to the quality of public services, state employees, the formulation of policies and the application of these policies, as well as the credibility of the national government's commitment to these policies. Range: -2.5 to 2.5. |
| Political stability | Refers to the probability of political stability. Range: -2.5 to 2.5. |

**Definition of study variables (*continuation*)** TABLE 7

| Variables | Descripción |
|---|---|
| **Quality of governance (cont.)** | |
| Voice and accountability | Refers to the extent to which citizens are free to choose their public representatives and government and to exercise freedom of expression and association. Range: -2.5 to 2.5. |
| Governance quality index | Index constructed through a principal component analysis (PCA) that includes: control of corruption, rule of law, regulatory quality, government effectiveness, political stability, and voice and accountability. |
| **Women in decision-making bodies** | |
| Women in parliament (%) | Percentage of women in national parliaments (upper and lower house). |
| **Culture** | |
| Power distance | Hofstede dimension that measures the degree to which less powerful members of a society accept and expect power to be unevenly distributed (high values: acceptance; low values: rejection). Range: 0 to 100. |
| Individualism | Hofstede dimension that measures the degree to which members of a society identify themselves as individuals (high values) or as members of a group or collective (low values). Range: 0 to 100. |
| Masculinity | Hofstede dimension that measures preferences for values such as heroism, assertiveness, success and material rewards (high values) versus preferences for cooperation, modesty, caring for the weak and quality of life (low values). Range: 0 to 100. |
| Uncertainty avoidance | Hofstede dimension that measures the degree to which members of a society feel uncomfortable (high values) or tolerant (low values) with uncertainty and ambiguity. Range: 0 to 100. |
| Long-term orientation | Hofstede dimension that measures the extent to which society is oriented towards future rewards, more open to change and willing to make sacrifices in the present for the sake of future gains (high values) versus societies with high respect for traditions and a willingness to maintain them (low values). Range: 0 to 100. |
| Indulgence | Hofstede dimension that measures the extent to which individuals in a society are guided by their desires and impulses (high values) or are governed by prescribed gender roles and strict sexual norms and present a greater concern with maintaining order (low values). Range: 0 to 100. |
| **Control variables** | |
| Assets | Logarithm of the book value of the total assets (thousands of euros). |
| Leverage | Leverage ratio defined as the book value of total debt/book value of total assets. |
| Size of the Board | Total number of directors |