Do 'soft law' board gender quotas work? Evidence from a natural experiment

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ABSTRACT

In a new era of "open governance", in which societal and corporate change is taking place, 15 predominantly European countries, including Spain, enacted board gender quotas to increase the share of women on boards. In this paper, we explore the effectiveness of the European Union's first "soft" quota — the 2007 Spanish Gender Equality Act recommending all large public and private Spanish firms to appoint a target of 40 percent of each gender to serve as board directors by 2015. The Act provides an incentive in that quota compliant firms may receive a preference for the tendering of public contracts. We draw on institutional and resource dependency theories to motivate the first empirical test of a "soft" quota which is distinct from Norway's "hard law" board gender quota, and more similar to the proposed EU-wide quota. Using a large novel panel of 767 Spanish firms and 2786 firm-year observations from 2005 to 2014, we exploit the Spanish Act as a natural experiment and employ a difference-in-differences model. We find that less than nine percent of targeted firms fully comply with the quota. Firms that depend on public contracts are significantly more likely to increase female representation, although quota compliant firms do not actually benefit from the Act's potential incentive. The results highlight the Spanish government's lack of commitment to the quota, and that the quota's normative obligations did not trigger the adoption of gender-balanced boards.

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1. Introduction

Women are underrepresented on the boards of directors of companies in the United Kingdom (UK) (Vinnicombe, Doldor, Sealy, Pryce, & Turner, 2015), the United States of America (USA) (Kogut, Colomer, & Belinky, 2014), Spain (Mateos de Cabo, Gimeno, & Escot, 2011), Italy (Bianco, Ciavarella, & Signoretti, 2015), France (Nekhili & Gatfaoui, 2013), and many other countries (Terjesen & Sealy, 2016). Concerned with persistently low female representation and potential discrimination on corporate boards and mimicking political gender quotas (Esteve-Volart & Bagues, 2012; Baltrunaite, Bello, Casarico, & Profeta, 2014), several countries established board gender quotas.[1]

Norway enacted the first board gender quota in December 2003, requiring public limited companies' boards to be comprised of at least 40% of each gender by 2008. Noncompliant firms faced stiff penalties such as delisting, nonregistration, and fines. All firms complied by the deadline; however, this "hard quota" success may not be generalizable to other countries' "soft" quotas. The purpose of this paper is to empirically investigate the effectiveness of a "soft" gender quota to ensure gender equality on corporate boards and particularly whether firms will comply without sanctions for noncompliance.

A "hard quota" refers to a binding instrument that prevents companies lacking a gender-balanced board from remaining listed on a stock exchange, and compensating the board members or even operating. In contrast, a soft quota is not binding; hence, a firm that lacks a gender-balanced board can continue to operate, and only faces recommendations, warnings, and reports on the causes of

noncompliance, or receive tax rebates and/or public subsidies for compliance, as in the Spanish case.

Inspired by the Norwegian quota's success, the 2007 Spanish Gender Equality Act was the second quota law to require large firms to appoint at least 40% of both genders on the boards, but unlike the Norwegian quota, the Spanish quota does not establish negative consequences for companies that fail to meet the target. Indeed, the Spanish Act only provides the incentive that the government may show preference in awarding public contracts to firms that follow its guidelines, thus following a soft approach (soft quota).

Nonbinding legislation and self-regulatory initiatives are typically preferred by policy-makers who seek to limit political opposition to quotas. However, does such nonbinding legislation really work, at least in the short to medium term? Enough time has passed to determine whether the pioneering Spanish Act achieved the expected outcomes.

Other European countries later adopted some kind of quota. In 2010, Iceland passed a law on board gender quotas (40%) on the boards of all companies with more than 50 employees. Icelandic law does not include punitive sanctions for noncompliance, but new companies must follow the 40% gender balance regulation (Arnardottir & Sigurjonsson, 2017). A year later, France passed a law requiring a gender balance (40%) among the nonexecutive directors of the largest companies (Zenou, Allemand, & Brullebaut, 2017). Similar laws (33%) passed in 2011 in Belgium (Levrau, 2017) and in 2012 in Italy (Profeta, Aliberti, Casarico, D'Amico, & Puccio, 2014). In Belgium, France, and Italy, noncompliant firms can be fined, dissolved, or banned from paying directors. In particular, in Italy, in the event of noncompliance, a progressive warning system with monetary fines culminates in the eventual removal of the board (Profeta et al., 2014). The Netherlands introduced a 30% gender quota in 2013 for the corporate boards of large public and limited liability companies (Kruisinga & Senden, 2017). Similar to Spain, the Netherlands enacted "soft" quotas without sanctions. In 2015, Germany set a 30% quota for companies that are listed or that are subject to full co-determination (Kirsch, 2017), requiring board seats to be left unfilled if qualified women cannot be found. In 2017, Portugal and Austria also implemented quotas. The Portuguese quota required at least 33.3% women for listed companies.[2] Noncompliance may lead to fines. In Austria,[3] the quotas target listed companies as well as companies with more than 1000 employees and require the supervisory board to be composed of at least 30% women. The sanction for noncompliance consists of the nullification of appointment.

To study the effectiveness of the Spanish "soft" gender quota, we employ a novel large national panel data set of 767 large Spanish firms from 2005 to 2014. This data set is the largest available panel of Spanish firms with information on directors' gender. We extend the mostly descriptive studies of the Spanish quota (e.g., Conde-Ruiz & Hoya, 2015; González-Menéndez & Martínez-González, 2012; Izquierdo, Huse, & Möltner, 2016) by using a nine-year panel and a natural experiment to examine the effectiveness of a soft gender quota. Our study seeks to provide policy-makers with empirical evidence of the merits of alternative positive action measures such as preference for public contracts.

This stimulus offers us the opportunity, using natural experiment research methods, to examine whether such active policies result in the desired gender targets for board directors. These policies, if effective, can be seen as an attractive means for improving board gender balance without the political drawbacks of a hard quota. This analysis is particularly salient as the EU recently proposed a region-wide board gender quota that mimics some aspects of the Spanish soft approach in that there is a vague promise of public contract preference for compliant firms.

A difference-in-differences (DiD) approach helps address the empirical challenges associated with evaluating public policy and inferring causal conclusions about the incentives to motivate firms to comply with the quota. The treatment group consists of those companies that can take advantage of the Act's incentives. The control group comprises firms not directly incentivized by the quota. The research design controls for potential sources of heterogeneity in panel regressions that may prevent us from identifying the public contract incentive effects such as time, industry-specific trends, and observed firm heterogeneity, which may additionally affect the growth in the proportion of women directors on each firm's board. Finally, we run several robustness checks to test the sensitivity of our results to changes in the original models and run several placebo experiments to confirm that our results are not by chance or any accident.

2. Context: the Spanish gender equality act

Spain's traditional values concerning women's roles in society reflect an androcentric cultural heritage and rampant gender discrimination (Gabaldon, Anca, Mateos de Cabo, & Gimeno, 2016; Mateos de Cabo et al., 2011). Persistent and embedded societal attitudes toward women and the late advent of the women' rights movement are a consequence of almost four decades of a military dictatorship (Campbell & Minguez-Vera, 2010). Women's status in this predemocratic authoritarian regime was based on the traditional male breadwinner model, in which women's main and only role was as housewife/caretaker (Cáritas Española, 1983). Following the Spanish dictator Franco's death in 1975, Spain transitioned from an authoritarian regime to a democracy in less than seven years, in which two parties, the socialist (PSOE—Partido Socialista Obrero Español) and the conservative (PP—Partido Popular), have alternated power. Spanish women's roles in society have dramatically increased since then (Bustelo, 2016).

Spanish women are now fully integrated in the labor market, enjoy equal access to education, and the gender pay gap in Spain was 14.2% in 2016, which was lower than the European Union (EU) average (16.2%). The Spanish female labor participation rate was 68.8% in 2017, higher than the EU average (67.8%). However, unemployment is higher for Spanish women (19.1%) than men (15.8%), and far above the EU average for women (8.0%). The World Economic Forum (0.746 in 2017) ranks Spain as 24th in the world for gender equality, down from 10th place in 2007 when the then-ruling Zapatero government prioritized gender equality. Indeed, the latest significant institutional developments regarding Spanish gender equality occurred during the two terms of Zapatero's government (2004—2011), which imposed new gender equality measures (Bustelo, 2016). The introduction of the 2007 Act put the lack of women in senior positions on Spain's national agenda (Gabaldon & Giménez, 2017).

The main political actors in the debate were the socialist PSOE, which defended the measure for reasons of justice and equality, and the conservative PP, which opposed it as a restriction on the freedom of companies and an attack against the principle of merit (Lombardo & Verge, 2017). Spain's two most representative business organizations, the Spanish Confederation of Business Organizations (CEOE) and the Spanish Confederation of Small and Medium Enterprises (Cepyme), opposed the quotas due to meritocracy arguments (Lombardo & Verge, 2017). Indeed, Spain's choice of a weak incentive (soft quota) is explained, to a large

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[2] Lei n.º 62/2017 - Diário da República n.º 147/2017, Série I de 2017-08-01 107791612.

[3] Gleichstellungsgesetz von Frauen und Männern im Aufsichtsrat — GFMA-G (509/BNR).

extent, by the business sector's strong opposition to quotas. Such business organizations also claimed that there was a low supply of qualified women wishing to compete for board positions (Lombardo & Verge, 2017). The vast majority of women directors also disagreed with quotas, fearing that their merits would be questioned (González-Menéndez & Martínez-González, 2012).

Aside from government and business agents, the Spanish context was characterized by a lack of visible gender champions and advocates pushing for gender equality. Indeed, it was only possible to identify a handful of visible actors (e.g., Katharina Miller, a German lawyer and founder of "Parity in Action," and Ana Maria Llopis, former president of the Spanish food retailer DIA), but their initiatives were not coordinated and were considered ineffective (Bustelo, 2016). There were also few visible male advocates for board gender diversity in Spain. From 2011 onward, and with PP's general election victory, the central government shifted from focusing on the demand-side to the supply-side, emphasizing measures such as training for women (e.g. the "Promociona" program), and the establishment of women's networks and mentoring programs (Lombardo & Verge, 2017).

The main rationale underlying the 2007 Act was social justice. Indeed, according to the Minister of Labour and Social Affairs, the Act constituted a step toward "democratic justice, cultural transformation, and social progress, and fair economic rules of the game, identifying as causes of discrimination gender biases and stereotypes in the selection processes" (González-Menéndez & Martínez-González, 2012: 175). Similarly, the Act's preamble (Organic Law 3/2007 of 22nd March) argues that gender equality is a matter of social justice and is aligned with the United Nations Convention on the Elimination of All Forms of Discrimination against Women, the EU Treaty of Rome, and the Spanish Constitution. Political and business sectors' strong opposition to a hard quota, including opposition from women entrepreneurs and directors, forced the government to employ a soft quota. The Act introduced a non-mandatory board gender quota. In particular, the Act reads in Articles 75 and 78:

> "Companies obliged to present unabridged financial statements of income will endeavor 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." (Article 75)

> "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 percent of the total." (Article 78)

Spain's quota applies both to inside directors (i.e., firm employees) and outside directors. Another key feature is that the quota applies to large firms that are required to present unabridged financial statements of income, i.e., firms that fulfil two of the following conditions: (i) more than 11.4 million euros in total assets, (ii) more than 22.8 million euros in annual revenue, and/or (iii) more than 250 employees. Thus, the Spanish quota applies to all large private and public firms; so it is significantly greater in scope than other countries' quotas (e.g., Italy, Portugal, and Belgium).

Finally, the main difference is that unlike the Norwegian quota's heavy sanctions, the Spanish legislation is a sanction-less recommendation with only a single incentive in Article 34, whereby the government may show preference in awarding contracts to firms that follow its guidelines (Gender Equality Act, 2007, reading in part in Article 34):

> "In the specific administrative clauses, the contracting bodies may provide for preference in the award of contracts for quotations submitted by companies that substantiate, along with their technical or professional solvency, that they follow the guidelines set out in the preceding item, provided that such quotations must match the most advantageous offers from the standpoint of the objectives on which award is based." (Article 34.2)

Interestingly, following parliamentary amendments, the EU Directive Proposal for a quota for women on corporate boards seems to adopt the Spanish approach rather than other countries' hard quota precedents. In fact, the EU Directive Proposal for *Gender balance among nonexecutive directors of companies listed on stock exchanges* establishes the objective to reach a gender quota of 40%, but the EU Directive only compels member states to ensure that there are women among candidates (Article 4.1). Article 6 outlines the following sanctions: administrative fines, exclusion from public calls for tenders, partial exclusion from EU funding, and the declaration of null appointment. Although nullifying appointments might be considered a hard quota sanction, they only occur if the nullity is linked to the 40% board gender quota and not to the absence of female candidates on the shortlist. Thus, the EU Directive Proposal offers member states the freedom to choose between hard and soft approaches, and in the latter case an instrument that is similar to the Spanish Act.

3. Theoretical development

Extant literature on Spain's board gender quota largely focuses on the relationship between board gender diversity and firm performance (e.g., Campbell & Minguez-Vera, 2010; Gallego, García, & Rodríguez, 2010; Reguera-Alvarado, de Fuentes, & Laffarga, 2017), a topic beyond the present study's scope. A handful of studies evaluate the 2007 Act's effectiveness in stimulating greater numbers of female directors, albeit from a descriptive approach. All extant studies reach a similar conclusion in the sense that although some progress has been made since the Act was passed, the percentage of female board members increased at a very slow pace, and there is still a long way to go before gender equality is achieved. González-Menéndez & Martínez-González (2012) analyzed the quota's impact on female director representation in 35 large firms from 2004 to 2010, finding a positive qualitative and quantitative effect, albeit one that is insufficient to improve women's access to corporate boards. Conde-Ruiz and Hoya (2015) examined the presence of female board members at the same listed companies, reporting that although the share of female directors increased from 2007 to 2013, it remains well below the Act's 40% target. Izquierdo et al.'s (2016) survey-based research suggests that the slow progress of voluntary approach results necessitates the threat of a quota.

All aforementioned studies restrict their analyses to descriptives. In contrast, the present study expands our knowledge of the Spanish Act's impact on female director representation in three important ways. First, we extend the time period (2005–2014), observing changes in firms' board composition every three years (the average rotation of board members). Second, unlike previous studies' attention to Spanish listed companies or a small subsample (e.g., IBEX 35: The Madrid Stock Exchange's 35 most liquid stocks), we analyze a large panel of 767 Spanish large (both listed and private) firms that better replicates the 2007 Act's scope. Third, and most importantly, we employ a rigorous econometric approach:

DiD models allow us to be the first to identify public contract incentive effects (Article 34) on quota compliance and the proportion of female directors. The effectiveness of the soft quota recommendation (Article 75 and 78) is tested by comparing the dummy variable after the Equality Act with the time trend variable. In both cases, several robustness exercises ensure the validity of our results.

Outside of Spain, the board gender quota outcome literature primarily focuses on Norway's hard quota impact in terms of performance. Thus, previous research analyzes the impact of the quota in terms of comparing post-quota stock price movements by firms with different information asymmetries (Nygaard, 2011), abnormal stock returns and changes in Tobin's Q between Norwegian firms (treatment) and other Nordic and US firms (control) (Ahern & Dittmar, 2012), changes in listing status (Bøhren & Staubo, 2014), changes in return on assets for the targeted nonfinance public limited companies and the nontargeted ordinary limited companies (Dale-Olsen, Schøne, & Verner, 2013), and changes in operating profits, employment, and labor costs between Norway's listed firms (targeted by the quota) and nonlisted firms and other Nordic firms (Matsa & Miller, 2013). All prior research assumes that targeted firms comply with the hard quota; however, this might not be the case for a soft quota such as the Spanish Act. Thus, our study examines the actual fulfilment of the targeted quota (or at least the increase in the proportion of female directors).

Before exploring the rationale behind the Spanish quota, we stress that the Spanish Equality Law includes different articles regarding gender balance on boards. Articles 75 and 78 (40% quota goal) include the legal recommendation for all firms covered by the Act (all large firms). Article 34.2 (economic incentive) introduces positive reinforcement, primarily intended for companies that depend on government contracts. Therefore, the theoretical ideas we use to justify the Spanish quota come directly from the spirit and the aim behind these two different legal regulations.

3.1. The adoption and implementation of a soft quota

Within corporate governance, when existing practices become established as law (and thus an enforceable norm), the expectation is that all targeted firms will comply. Indeed, in order to attain legitimacy, firms make concerted efforts to conform to established standards (Finkelstein, Hambrick, & Cannella, 2009). For instance, mandatory information disclosure rules pressure firms to change (Doshi, Dowell, & Toffel, 2013). This results in a convergence in organizations' most visible attributes, such as board gender composition.

The gender and politics literature discusses the drivers of gender quota legislation indicating that a mere change in formal institutions (i.e., adopting quotas) does not necessarily mean that informal norms and practices change as well. Indeed, the literature on gender electoral quotas stresses the importance of disrupting these entrenched informal power structures that have kept women out of positions of power. In this regard, Hughes, Paxton, and Krook (2017) emphasized that board gender quotas target decision-making positions that are among the most resistant to women's equal inclusion and suggest paying greater attention to the dynamics of resistance and backlash to quotas.

Some studies on political gender quotas advocate the disruption of longstanding informal norms of exclusion as the only means of augmenting women's representation in leadership positions (with or without quotas). Htun and Jones (2002) demonstrated that political quota laws in Latin America are only effective in increasing women's presence in legislatures when institutions and practices change to ensure that the quota can work (i.e., they use closed lists, explicit legislation mandating placement, big district magnitudes,

and good-faith party compliance). Scandinavian countries, which have the largest proportion of women in parliament, saw women's political representation significantly increase prior to the introduction of any legal quota regulations (Dahlerup & Freidenvall, 2005). In the Scandinavian context, political parties' and women's organizations' strategies to raise women's political representation (informal norms) were crucial in increasing the parliamentary representation of women, and so quotas alone are not necessary (and not sufficient) to ensure large proportions of women in parliament (Dahlerup & Freidenvall, 2005). In the board gender quota context, Iceland is an example of how a general shift in attitudes of existing informal institutions and processes can result in change. According to Arnardottir and Sigurjonsson (2017), Iceland's economic shock, called pre-existing values, knowledge, behavior, processes and practices into question, and stimulated a serious discussion regarding gender quota legislation, which was ultimately passed in the Icelandic Parliament. Shortly after the gender quota came into effect in September 2013, several public and private actors (stock exchange, academics, media, and businesses) turned in favor of the mandatory gender quota and urged others to follow the same path.

Other studies demonstrate that quotas with strong sanctions for non-compliance result in the desired outcomes. These studies also tend to refer to the necessity of changing informal practices and institutions but use this as an argument to support gender quotas. For instance, Krook, Lovenduski, and Squires (2009) noted that political soft quotas favor equal opportunities over equal results, and a preference for non-intervention in candidate selection processes only produce small increases in women's political representation. Franceschet and Piscopo (2013) argued that in order to move beyond the symbolic acceptance of women's equality, actions that broaden and deepen quotas should be imposed, such as mandatory equality mechanisms (e.g., increased penalties for non-compliance and regulations that clarify procedures for nominating and/or shortlisting women). Meier (2004) identified a contagion effect between legal (formal norm) and party gender quotas (informal norm) in the Belgian electoral process in the way that party measures stimulate the development of quota laws, whereas these act as a benchmark for party quotas.

In Spain, as previously discussed, the strong opposition from Spanish political and business sectors led lawmakers to soften the Act's wording into a recommendation (a soft approach). The reasoning behind this soft approach was to influence informal institutions by stimulating companies to evaluate the potential existence of gender bias in their selection processes (usually characterized by selecting board members from informal networks through opaque procedures). This way, companies would broaden their selection processes to include a talent pool of women whom had been discarded in the past, nominating more women to their boards, and hence conforming to societal expectations. This rationale is introduced in the Act's preamble, which expresses a desire to incorporate corporate social responsibility and "ensure that the prevailing criterion in the appointment of board members is talent and professional performance, for the process can only be impartial if sex is not an obstacle in such nominations" (Gender Equality Act, 2007, p. 6).

Piscopo and Clark-Muntean (2018) concluded that soft quotas may increase female directors' presence in the short term because the focus on the dearth of female directors creates a statutory threat, compelling companies to act and include voluntarily more women into positions of power, in order to demonstrate their progress and undercut government efforts to adopt more binding solutions. In this way, the Act would serve as a catalyst for informal institutional change, stimulating firms to increase women's presence on boards to gain legitimacy and to appear as more gender-sensitive to external constituencies.

Following the above reasoning, the Act's Article 75 must send strong messages regarding how Spanish companies must increase board gender diversity, or this symbolic statute might not be enough to trigger the desired change. Thus, we pose the following Hypothesis:

Hypothesis 1a. After a soft quota is enacted, firms will increase the percentage of female directors.

Given that the ultimate goal of the Act is a balanced presence of women and men on boards with a minimum 40% representation of each gender (Article 78), we also hypothesized the following:

Hypothesis 1b. After a soft quota is enacted, firms will be more likely to appoint a gender-balanced board.

We introduce two alternative hypotheses because success can be defined either in a strict sense (to reach the minimum 40% of female representation) or in a milder way that may be more appropriate for a soft approach (to increase levels of equality among men and women on Spanish boards, as noted in the Preamble II, by boosting the proportion of women on boards).

3.2. Incentives for quota compliance

One important resource for many firms is a strong relationship with the government, a significant customer that provides substantial income (Malatesta & Smith, 2014). Resource dependency theory (Pfeffer & Salancik, 1978) explains how firms appoint board members as a means of reducing uncertainty in the environment and providing linkages to critical resources. Therefore, given boards' dynamic nature (Hillman, Withers, & Collins, 2009), firms might modify board composition due to changes in public tender regulations.

For numerous Spanish firms, a strong working relationship with the government is a critical resource for survival and flourishing. Although the Spanish Act does not explicitly penalize firms that fail to comply with the quota, Article 34.2 limits noncompliant companies' access to public subsidies and government contracts. Given that this measure focuses on the share of women who serve on corporate boards, companies would need to first diversify their boards in order to then obtain the public contracts (i.e., board diversification is a prerequisite for public tendering).

Resource dependency theory predicts that firms that rely on government contracts will add women to their boards to improve

their likelihood of garnering public contracts. In order to test whether the positive reinforcement in Article 34.2 of the Act stimulates companies that depend more on government contracts to increase their percentages of women and achieve a gender-balanced board, we hypothesize the following:

Hypothesis 2a. After a soft quota with a public contract incentive is enacted, firms that are more dependent on public contracts will increase the percentage of female directors.

Hypothesis 2b. After a soft quota with a public contract incentive is enacted, firms that are more dependent on public contracts will appoint a gender-balanced board.

Regarding the research design, the first two hypotheses (H1a and H1b) reference the principal effect of the DiD experiment as they compare the potential impact of the recommendations of Articles 75 and 78 aimed at the whole set of targeted firms, whereas the subsequent two hypotheses (H2a and H2b) test the potential incremental effect by the interaction term that comes directly from the incentive for firms that are more dependent on public contracts.

4. Research design

4.1. Sample and data

To test the effectiveness of the Spanish quota, we use panel data on the composition of Spanish boards. The panel starts with the largest Spanish firms (both listed and unlisted) by operating revenues in 2003 obtained from SABI database (>100 million euros). Next, we select only those firms that were present and operative from 2005 to 2014 (i.e., true panel). By comparing identical firms before and after the Act, we rule out the possibility that any causal effects identified in our empirical exercise come from differences between firms that enter/exit the sample from those that remain across the nine-year period. As a final step, we exclude companies with only one director.

To determine gender composition, we follow prior research in using SABI's list of director names for each firm (Arosa, Iturralde, & Maseda, 2010; Barroso, Villegas, & Pérez Calero, 2011; Mateos de Cabo et al., 2011). Given that SABI only reports current board composition, we obtain a historical panel by downloading each firm's board of directors every three years (2005, 2008, 2011, and 2014), as these time intervals ensure mobility of board members

Table 1A
Spanish boards of directors in 2005, 2008, 2011, and 2014.

	2005				2008			
	Min.	Max.	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.
Board directors	2	49	6.08	4.11	2	47	5.84	3.91
Female directors	0	6	0.41	0.86	0	6	0.51	0.93
Male directors	1	46	5.67	3.95	1	42	5.33	3.63
Boards without women	0	1	0.74	0.44	0	1	0.67	0.47
Boards with one woman	0	1	0.17	0.37	0	1	0.21	0.41
Boards with two women	0	1	0.05	0.23	0	1	0.07	0.26
Boards with more than two women	0	1	0.04	0.20	0	1	0.05	0.21
Percent of female directors	0.00	75.00	6.76	13.59	0.00	75.00	8.30	14.46
	2011				2014			
	Min.	Max.	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.
Board directors	2	40	5.56	3.81	2	43	5.90	4.49
Female directors	0	10	0.55	1.04	0	7	0.69	1.11
Male directors	0	35	5.01	3.45	0	39	5.22	4.02
Boards without women	0	1	0.66	0.47	0	1	0.58	0.49
Boards with one woman	0	1	0.22	0.42	0	1	0.28	0.45
Boards with two women	0	1	0.07	0.25	0	1	0.07	0.25
Boards with more than two women	0	1	0.05	0.22	0	1	0.07	0.25
Percent female directors	0.00	100.00	9.14	15.31	0.00	100.00	10.95	16.19

Note: The total number of board directors includes institutional directorships which we exclude; we only include directorships held by individuals.

Table 2
Public expenditure dependence and quota compliance.

	Public Expenditure Dependence		Quota Compliance	
	# firms	Percent	# firms	Percent
2005	81	11.11%	31	4.25%
2008	80	11.13%	41	5.77%
2011	68	9.83%	38	5.49%
2014	69	10.42%	33	4.98%

Note: Public expenditure dependence is a dummy = 1 if the firm income from public contracts is equal or higher than 5 percent of total income. Quota compliance = 1 if the percentage of female directors is between 40 and 60 percent.

(Garay & González, 2008). We exclude institutional board seats that are represented by a changing group of individuals of unknown identity and gender. We determine each director's gender through a multistep process, first through the examination of first names (since Spanish first names clearly mark gender). For non-Spanish board members, we use a variety of methods including gender-specific language in annual report biographies, photographs, and Internet articles. These steps provide 767 firms and 2786 firm-year observations.

4.2. Descriptive statistics: Spanish board diversity

Women only held 6.8% of the directorships of the largest 767 Spanish firms in June 2005 (Tables 1a—1b), and only 26% of firms had at least one woman on their boards. By June 2014, the share of female directors increased to 11.6% and the share of firms without female directors fell to 58%.

Next, we examine the percentage of quota-compliant firms (40%—60% board gender balance). The largest increase in quota compliance occurred in the early years prior to the Act (2005—2008), before stagnating more recently (2011—2014) (Table 2). As the Act's incentive refers to public contracts, we track the proportion of firms' income from the public sector. The percentage of firms with public contracts representing more than 5% of their income did not exceed 11% in 2014 (Table 2). Finally, Table 3 includes some descriptive statistics of the firms' characteristics.

4.3. Empirical strategy

We use a DiD panel data model to examine the Act's effectiveness. This model consists of the following components:

i) The policy outcomes: We use two dependent variables: (1) *Percentage of female directors*, defined as each firm's share of female directors to total directors, and (2) *Quota compliance*, a dummy variable that is equal to one if the share of female directors is between 40% and 60%, and zero otherwise.
ii) The treatment to be evaluated: Public contract incentive in the Act to motivate firms to modify board composition. Our treatment is the dummy variable *Post-Equality Act*, equal to 1 if the observation is after the Act (2011 and 2014), and 0 otherwise (2005 and 2008).[4]
iii) The treatment group: Those firms that are more dependent on public contracts. We need to identify a threshold large

enough to truly affect the profit and loss of a company if excluded from public contracts. Thus, we include a firm in this treatment group when the ratio of income from public contract to total income in the previous two years was higher than 5%. This represented roughly 10% of the sample (Table 2). In the robustness section, we discuss alternative variable operationalizations with identical conclusions. We observed that no firms with at least 40% of each gender before the Act began to use of public tendering after 2008 to take advantage of the Act's preferences for quota compliant firms, excluding the possible endogeneity of the treated group due to selection bias problems.

iv) Control group: Firms that are not directly incentivized by the quota, that is, firms with less than 5% public income. The dummy *Public Sector Contractor* indicates a firm's membership in the treatment group (1) or control group (0). Following a DiD approach, we estimate the following two models:

$$
\begin{aligned}
WoB_{it} = {} & \gamma \cdot Post\_Eq\_Act_t + \phi \cdot Public\_Sector\_Contractor_{it} \\
& + \psi \cdot Post\_Eq\_Act_t \cdot Public\_Sector\_Contractor_{it} + \alpha_i \\
& + \beta \cdot X_{it} + \delta \cdot Year_t + \varepsilon_{it}
\end{aligned} \tag{1}
$$

$$
\begin{aligned}
\Pr[Gender\_Balance_{it} = {} & 1 \mid independent\ variables\,] \\
= {} & F[\gamma \cdot Post\_Eq\_Act_t \\
& + \phi \cdot Public\_Sector\_Contractor_{it} \\
& + \psi \cdot Post\_Eq\_Act_t \cdot Public\_Sector\_Contractor_{it} \\
& + \alpha_i + \beta \cdot X_{it} + \delta \cdot Year_t]
\end{aligned} \tag{2}
$$

where $F[\cdot]$ is the cumulative logistic distribution function $F[Z] = 1/(1+e^Z)$.

The DiD estimator is the coefficient associated with the interaction of *Post-Equality Act x Public Sector Contractor* that captures the double difference between groups and between policy periods, that is, the causal effect of the Act for firms that undertake public sector contracts.

In order to attain unbiased and consistent DiD estimators, we introduce additional control variables to ensure that the common trend assumption holds (Athey & Imbens, 2006; Cerulli, 2015). The trend variable *Year* (2005, 2008, 2011 and 2014) captures the possible general tendency to increase the share of female directors and to comply with the quota, independent of the Act. We introduce a wide range of covariates and factors (X_{it}) to control for systematic differences in the presence of female directors between firms with high dependence on public contracts and firms that have no such dependence (Athey & Imbens, 2006). Following Mateos de Cabo et al. (2011), control variables include: *HHI (ln)* defined as the log of the Herfindahl—Hirschmann industry concentration index (sum of squared market shares in 2-digit CNAE, the Spanish equivalent of SIC codes) based on SABI data; *Percentage of female managers in the industry*, proportion of female managers in each 2-digit CNAE industry based on the Spanish Labour Force Survey; *Board size (ln)*, the log of the number of directors; *Risk (ln)* captures volatility, as the log of the standard deviation of annual return on assets over a 13-year rolling window; *Firm size (ln)*, the log of the three-year mean of total assets; and *Firm age (ln)*, the log of the number of years since the company was founded. All variables are lagged two years. We also include *Industry dummies* for six sectors: petrol and power; financial services and real estate; basic materials, industry, and construction; consumer goods; consumer services; and technology and telecommunications. In addition, following Meyer (1995), and in order to ensure that the parallel trend

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[4] We do not include 2008 in the post-quota period because the Gender Equality Act's provision regarding women's participation on boards can only be considered after the Act came into force in 2007. Therefore, it would take some time for firms to achieve a gender-balanced board. In fact, we observe that every three years, only 35%—38% of directors leave the board. In the robustness section, we explore alternative specifications where 2008 is included in the post-Act treatment.

Table 3
Descriptive statistics of firm characteristics.

Variable	Quota Compliance = 0				Quota Compliance = 1			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
2005								
Total assets (ln)	12.1	1.3	8.6	17.7	11.7	1.1	9.7	14.4
Risk (ln)	1.4	1.0	−5.5	4.5	1.4	0.6	0.2	2.6
Age	30.9	23.3	3.0	114.0	32.3	15.3	6.0	78.0
2008								
Total assets (ln)	12.4	1.3	9.3	17.9	11.8	1.3	9.8	16.7
Risk (ln)	1.3	0.9	−4.6	4.3	1.3	0.7	−0.2	2.5
Age	34.1	23.2	6.0	117.0	33.9	20.1	9.0	96.0
2011								
Total assets (ln)	12.5	1.4	9.2	18.3	12.2	1.1	9.9	13.8
Risk (ln)	1.5	0.9	−6.6	4.2	1.3	0.8	−1.1	2.6
Age	36.9	23.4	9.0	120.0	39.7	20.1	12.0	99.0
2014								
Total assets (ln)	12.4	1.5	7.3	18.3	12.2	1.1	9.6	14.0
Risk (ln)	1.6	0.9	−4.3	4.8	1.3	0.7	−0.2	2.6
Age	39.9	23.1	12.0	122.0	39.8	19.9	13.0	102.0

assumption holds, we include interactions of the covariates with the treatment dummy to control for changes in the compositions of control and treatment groups both pre- and post-quota.

This DiD framework enables us to test the effectiveness of Article 34 in the Act (H2a and H2b) but also allow us to test the effectiveness of the general recommendation to all firms set by Articles 75 and 78 (H1a and H1b). The latter effect should be reflected in a positive and significant γ (i.e., the coefficient on $Post\_Eq\_Act_t$ variable), independent of the general time trend ($Year_t$), that accounts for the slow organic growth in women's participation in the Spanish economy as described in Section 2.

5. Results

5.1. The difference-in-differences panel data estimator: hypotheses testing

We conduct the DiD regression analysis for equations (1) and (2). For the *Percentage of Female Directors*, we use a panel regression model (equation (1)) with random effects (Table 4), according to Hausman test results. Column 1 estimates only the effects of *Public sector contactor* and *Post-Equality Act*; column 2 adds the interaction of *Public sector contactor x Post-Equality Act* acts as the basic DiD analysis; column 3 adds a trend variable to capture the possible general tendency to increase the share of female directors independent of the quota; column 4 estimates the regression in a multivariate framework (including control variables); and column 5 includes all interactions between covariates and policy, in both cases (columns 4–5), to avoid potential problems of violation of the parallel trend assumption that ensure against the presence of systematic differences between the presence of female directors in firms that depend on public contracts and firms that do not.

We observe an increase in the percentage of female directors after the enactment of the quota for the whole set of companies, as reflected in the *Post-Equality Act* coefficient (columns 1–2). Considering the secular trend of an increase in the share of female directors due to the passage of time (column 3), we do not see a consistent result, and this is reinforced after adding control variables and interactions with policy (columns 4–5). Therefore, the principal effect of *Post-Equality Act* is not significant (p = 0.304), and there is no evidence to support H1a.

Regarding the interaction term between *Public sector contractor* and *Post-Equality Act*, we observe a positive effect on the percentage of female directors after the quota (column 2). The statistically different values before and after the quota provide strong support

for H2a: The quota led firms that depend on public contracts to appoint more female directors. This positive effect remains after taking into account the general trend (column 3) and controls for parallel trends (columns 4 and 5). The positive and highly significant coefficient for the interaction (p-value ranges between 0.001 and 0.003) represents an increase of about 4pp in the share of female directors.

Table 5 estimates logit panel data models on quota compliance (equation (2)). We use a random effect panel model in accordance with Hausman test results. Column 1 estimates the effects of *Public sector contactor* and *Post-Equality Act*; column 2 adds the interaction of *Public sector contactor x Post-Equality Act* as the basic DiD analysis; column 3 adds a trend variable to capture the possible general tendency; and columns 4 and 5 ensure the parallel trend assumption, including the control variables and their interactions with policy, respectively.

Regarding the effects of DiD variables, we observe that the *Post-Equality Act* (p-values range from 0.361 to 0.617) does not increase the likelihood that the entire sample of firms complies with the quota (columns 1–5). This result does not support H1b; thus, we conclude that the quota does not increase the probability that large Spanish firms will have gender-balanced boards. The interaction coefficient, *Public sector contractor x Post-Equality Act*, is positive and highly significant (p-values range between 0.017 and 0.032), providing strong support for H2b (columns 2–5). Therefore, firms that depend on public contracts are more likely to comply with the quota. This positive effect remains after taking into account the general trend (column 3) and controls for parallel trends (columns 4–5).

5.2. Robustness checks

We test the sensitivity of our DiD results to changes in the models (Tables 6–7). We estimate both random and fixed effects but only report the relevant ones according to the corresponding Hausman tests. We include industry dummies when the Hausman tests allow us to do so.

Alternative timeframe. Our previous analyses consider that 2005 and 2008 correspond to pre-legal period because 2008, just one year after the Act, is too close for firms to implement board changes (i.e., it takes three years to change one third of the board). As this assumption can be contested, we run a robustness check including 2008 in the Post-Equality Act period (Tables 6–7, column 1), yet the earlier finding still holds: The only sizable effect of the quota is on firms that depend on public contracts.

Unbalanced panel. Our sample is derived from firms operating

Table 4
DiD random effects panel regression on percentage of female directors.

	(1)	(2)	(3)	(4)	(5)
Public sector contractor	1.188	−0.394	−0.418	−0.306	−0.170
	(1.122)	(1.237)	(1.233)	(1.244)	(1.257)
Post-Equality Act	2.644***	2.258***	−0.983	−0.822	−9.505***
	(0.357)	(0.378)	(0.791)	(0.799)	(3.973)
Public sector contractor × Post-Equality Act [†]		3.657***	3.636***	4.036***	3.933***
		(1.210)	(1.205)	(1.213)	(1.236)
Year (trend)			0.544***	0.496***	0.496***
			(0.117)	(0.122)	(0.123)
HHI (ln)				−0.343	−0.102
				(0.263)	(0.325)
Percentage of female managers in the industry				4.891*	2.464
				(2.566)	(3.100)
Firm age (ln)				1.548**	1.620**
				(0.682)	(0.686)
Board size (ln)				1.583**	1.507**
				(0.618)	(0.717)
Risk (ln)				−0.575*	−0.802
				(0.330)	(0.381)
Firm size (ln)				−1.017***	−1.374***
				(0.332)	(0.377)
Constant	7.395	7.567	−1084.214	−985.144	−979.688
Observations	2793	2793	2793	2786	2786
Number of firms	767	767	767	767	767
(Random) Firm effects	Yes	Yes	Yes	Yes	Yes
Industry effects	No	No	No	Yes	Yes
Interaction: Control variables × Policy	No	No	No	No	Yes
Wald chi2	55.58	64.96	87.21	141.03	149.22
p-value	0.000	0.000	0.000	0.000	0.000
Hausman test	0.52	1.19	2.38	16.12	19.62
p-value	0.771	0.756	0.666	0.096	0.238

Notes: Dependent variable is the percentage of female directors (ranging from 0 to 100). Regressors include: Public sector contractor (=1 if companies with public contract income over total income > 5 percent); Post-Equality Act (years 2011 and 2014); HHI (Herfindahl Index of income concentration by industry); risk (the standard deviation of the return of assets over the previous ten years); firm size (firm total assets in thousand euros); board size (number of board directors); and percentage of female managers in the Industry. [†] DiD estimator for the causal effect of the Spanish Gender Equality Act on the dependent variable: percentage of female directors.

before the quota (income >100 million euros in 2003), when the political agenda was distinctly different. This balanced panel ensures the exogeneity from any consequence that the Act might have on firms. However, to confirm that a firm's survival until 2014 does not affect our results, we run the same regressions on an extended sample that includes firms that disappeared between 2005 and 2014 (Tables 6–7, column 2), and the previous conclusions still hold.

Alternative board size restriction. In the main models, we restrict the sample to boards comprised of at least two members. However, as a board composed of only three directors cannot possibly reach the 60/40 gender balance, we also exclude firms with just three board members (Tables 6–7, column 3) and reach the same conclusions.

Alternative measure for public sector dependence. We set the threshold to identified treatment and control groups at 5% of total income. As this threshold could be contested, we undertake a regression discontinuity analysis for the increase in the share of female directors and quota compliance before (mean values in 2005–2008) and after the Act (mean values in 2011–2014) for different cut-off values. This analysis does not reveal any clear threshold where the change is preferable to the others (Fig. 1). Thus, we run additional regressions using the continuous variable *public contract income over total income* instead of the *public dependence* dummy to avoid the potential problem of discretional dichotomization. The results show that the interaction with the Post-Equality Act is even more significant for *percentage of female directors* (Table 6, column 4), and slightly less for *quota compliance* (Table 7, column 4).

Year dummies. The DiD methodological framework does not allow us to include a *Post-Equality Act* dummy and *year* dummies at the same time due to their perfect multicollinearity. We, therefore,

add a trend variable. Given that the results may be nonlinear (i.e., a decelerating tendency), additional robustness analyses (Tables 6 and 7, column 5) substitute the trend with year dummies and drop the *Post-Equality Act* dummy. In both models, the interaction is still significant.

Placebo experiments. In order to confirm that our effects are not based on coincidence, we run 4000 placebo experiments, with random treatment groups with the same number of observations by year that we observe for the *public contractor* variable. We then run the same regressions (equations (1) and (2)), including control variables. We obtain only six cases for equations (1) and (42) cases for equation (2) that match or improve the real effect found (i.e., 0.00149477 and 0.01096163 of total cases). Thus, these experiments confirm that the effects are at least as extreme as the standard p-values implied (i.e., 0.00088251 and 0.01750744).

Reverse causality and credibility issues of public income increases. Article 34 is only effective if the government fulfils its promise of prioritizing public contracts for quota-compliant firms. If firms perceive that the government is not committed, the quota's effectiveness will be further weakened. Therefore, we examine whether quota-compliant firms increase their income from public contracts compared with noncompliant firms (equation (3)):

$$\Delta PI_{it} = \gamma \cdot Post\_Eq\_Act_t + \phi \cdot Gender\_Balance_{it-3}$$
$$+ \psi \cdot Post\_Eq\_Act_t \cdot Gender\_Balance_{it-3} + \alpha_i + \beta \cdot X_{it} + \delta_t + \varepsilon_{it}$$
$$(3)$$

where ΔPI_{it} is the income increase from public contracts over total income or the change in public sector contractor status (=−1 if public dependence decreased; =1 if increased; and =0 if

Table 5
DiD random effects panel logit regression on quota compliance.

	(1)	(2)	(3)	(4)	(5)
Public sector contractor	0.768	−0.205	−0.202	0.011	0.276
	(0.499)	(0.712)	(0.712)	(0.791)	(0.823)
Post-Equality Act	0.087	−0.123	−0.469	−0.430	−2.093
	(0.228)	(0.246)	(0.513)	(0.536)	(3.015)
Public sector contractor × Post-Equality Act [†]		1.729**	1.718**	2.008**	1.870**
		(0.769)	(0.758)	(0.842)	(0.872)
Year (trend)			0.058	0.017	0.013
			(0.076)	(0.081)	(0.083)
HHI (ln)				−0.346**	−0.223
				(0.147)	(0.210)
Percentage of female managers in the industry				2.619*	4.920**
				(1.402)	(2.000)
Firm age (ln)				0.725*	0.923**
				(0.376)	(0.420)
Board size (ln)				−0.455	−1.059**
				(0.355)	(0.485)
Risk (ln)				−0.212	−0.088
				(0.205)	(0.276)
Firm size (ln)				−0.258	−0.464*
				(0.179)	(0.240)
Constant	−5.950	−5.872	−122.788	−38.014	−28.856
Industry effects	No	No	No	Yes	Yes
(Random) Firm effects	Yes	Yes	Yes	Yes	Yes
Interaction: Control variables * Policy	No	No	No	No	Yes
Observations	2786	2786	2786	2786	2786
Number of firms	767	767	767	767	767
Wald Chi square	2.50	8.38	8.87	28.75	33.19
p-value	0.287	0.039	0.064	0.017	0.044
Hausman test	0.14	0.44	0.43	9.40	8.82
p-value	0.713	0.932	0.933	0.310	0.718

Notes: Dependent variable is quota compliance (=1 if percentage of female directors is between 40 and 60 percent, 0 otherwise). Regressors include: Public sector contractor (=1 for companies with public contracts income over total income > 5 percent); Post-Equality Act (years 2011 and 2014); HHI (Herfindahl Index of income concentration by industry); risk (the standard deviation of the return of assets over the previous ten years); firm size (firm total assets in thousand euros); board size (number of board directors); and percentage of female managers in the Industry. [†] DiD estimator for the causal effect of Spanish Gender Equality Act on the dependent variable: quota compliance.

unchanged).

There is no effect of quota compliance on change in public income (Table 8, columns 1–4). Thus, we find no sign of reverse causality in our sample as the quota compliance does not appear to

have encouraged public sector contracts. Indeed, firms' tendering of public contracts is driven more by the sector of activity, previous experience with other public contracts, and other factors than by quota compliance. We replicate the analysis using the change in

Table 6
Robustness Check: DiD random effects panel regression on percentage of female directors.

	(1)	(2)	(3)	(4)	(5)
Public sector contractor	−1.640	0.411	1.616		−0.315
	(1.572)	(1.532)	(1.753)		(1.245)
Public income over total income				−0.363	
				(1.934)	
Post Equality Act	−1.261	−0.710	−1.147	−0.641	
	(1.461)	(0.736)	(0.849)	(0.795)	
Public sector contractor × Post Equality Act [†]	5.115***	3.874***	4.133***		4.024***
	(1.566)	(1.204)	(1.307)		(1.214)
Public income over total inc. × Post Eq. Act [†]				9.181***	
				(3.335)	
Year (trend)	0.521***	0.471***	0.388**	0.496***	
	(0.185)	(0.135)	(0.152)	(0.122)	
Observations	2076	3282	2203	2783	2786
Number of firms	765	1027	707	767	767
Firm effects	RE	FE	FE	RE	RE
Industry effects	Yes	Yes	Yes	Yes	Yes
Year effects	No	No	No	No	Yes
Control variables	Yes	No	No	Yes	Yes
Wald chi2	126.69	8.89	6.87	135.12	141.14
p-value	<0.001	<0.001	<0.001	<0.001	<0.001
Hausman Test	8.87	22.37	21.35	16.58	16.66
p-value	(0.544)	(0.022)	(0.019)	(0.084)	(0.118)

Notes: Standard error in parentheses. ***p < 0.01. **p < 0.05. *p < 0.1; Dependent variable is the proportion of female directors (ranging from 0 to 100). Regressors include: Public sector contractor (1 for companies with public contracts income over total income > 5 percent); Post Equality Act (years 2008, 2011 and 2014); HHI is the Herfindahl Index of income concentration by industry; Risk is the standard deviation of the return of assets over the previous ten years; Firm size is the firm total assets in thousand euros; [†] DiD estimator for causal effect of Equality Act on dependent variable: proportion of women on boards.

Table 7
Robustness Check: DiD random effects panel logit regression on quota compliance.

	(1)	(2)	(3)	(4)	(5)
Public sector contractor	−0.206	−0.053	−0.186		0.031
	(0.986)	(0.742)	(0.837)		(0.790)
Public income over total income				−2.562	
				(3.483)	
Post Equality Act	0.824	−0.248	−0.565	−0.350	
	(0.888)	(0.489)	(0.572)	(0.524)	
Public sector contractor × Post Equality Act [†]	1.917*	1.870**	2.386**		2.019**
	(1.056)	(0.805)	(0.934)		(0.841)
Public income over total inc. × Post Eq. Act [†]				6.280*	
				(3.485)	
Year (trend)	−0.121	0.014	0.038	0.019	
	(0.113)	(0.074)	(0.085)	(0.079)	
Observations	2076	3282	2203	2783	2786
Number of firms	765	1027	765	767	767
(Random) firm effects	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes
Year effects	No	No	No	No	Yes
Control variables	Yes	Yes	Yes	Yes	Yes
Wald chi2	25.77	35.33	32.44	31.74	29.99
p-value	(0.040)	(0.002)	(0.006)	(0.007)	(0.018)
Hausman Test	3.67	0.00	5.81	13.72	9.01
p-value	(0.885)	(1.000)	(0.668)	(0.186)	(0.342)

Notes: Standard error in parentheses. ***p < 0.01. **p < 0.05. *p < 0.1; Dependent variable is the proportion of female directors (ranging from 0 to 100). Regressors include: Public sector contractor (1 for companies with public contracts income over total income >5 percent); Post Equality Act (years 2008, 2011 and 2014); HHI is the Herfindahl Index of income concentration by industry; Risk is the standard deviation of the return of assets over the previous ten years; Firm size is the firm total assets in thousand euros; [†] DiD estimator for causal effect of Equality Act on dependent variable: proportion of women on boards.

Public sector contractor status as the dependent variable (Columns 5−8). Once again, there is no effect on the dependent variable after the quota is enacted. A final confirmation that there is no effect for the 40% quota target is that a regression discontinuity analysis (Fig. 2) shows no difference at the 40% or any other threshold.

6. Discussion

The underrepresentation of women on corporate boards in Europe and across the world has received considerable attention in the media and the economic literature. The director market appears to have some important flaws that hinder women's access to these positions, in particular a preference for homogeneity at the board and managerial levels (Mateos de Cabo et al., 2011). Historically, closed networks of males (the "old boys' club") select board members from informal networks through opaque procedures, in a form of crony capitalism.

In a new era of "open governance," characterized by boards operating in an atmosphere of openness, wider corporate accountability, and improved decision making (Arnardottir & Sigurjonsson, 2017), and in which societal and corporate change is taking place, 15 predominantly European countries, including Spain, enacted board gender quotas to increase the share of women on boards. The European Commission also advocates for a region-wide 40% quota. The proposed EU policy includes instruments similar to those used in the Spanish case (e.g., exclusion from public
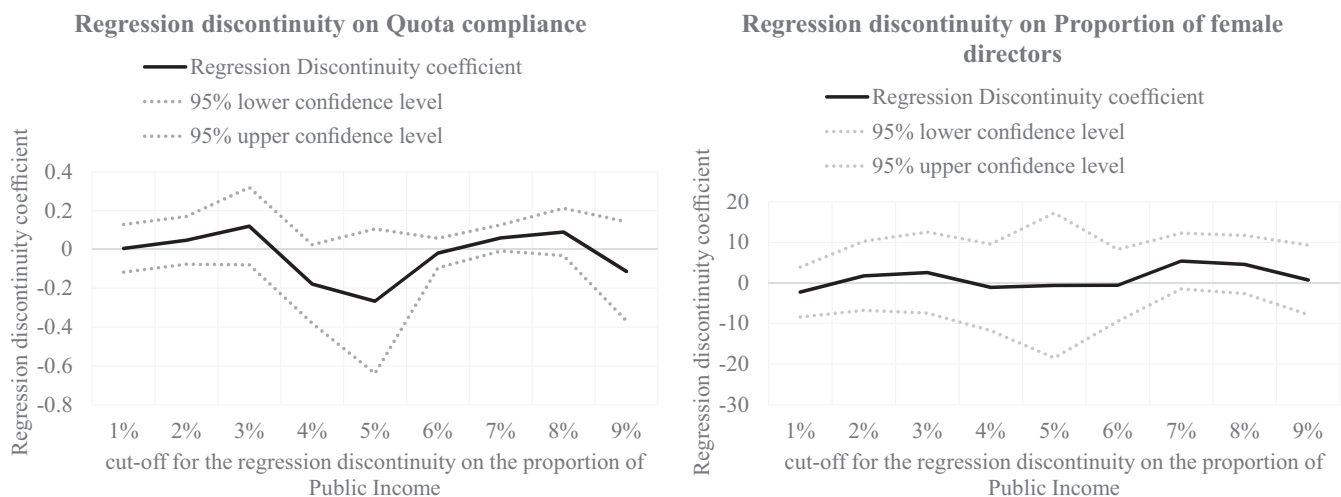
Fig. 1. Regression discontinuity analysis of the effect of public income dependence over quota compliance and proportion of female directors
Notes: Coefficients and confidence level intervals for regression discontinuity analysis of the increase in quota compliance (left panel) and proportion of female directors (right panel), before (mean of observed values in 2005−2008) and after (mean of the observed values in 2011−2014) the Spanish Gender Equality Act. For each cut-off value, we estimated the regression discontinuity with a first order polynomial and a bandwidth optimally selected. Regressions include the same control variables we used in equations (1) and (2).

Table 8
Panel data regression models on income increase from public contracts.

| Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Δ Public income	Δ Public income	Δ Public income	Δ Public income	Δ Public contractor	Δ Public contractor	Δ Public contractor	Δ Public contractor
Quota compliance (t-3)	0.001	0.009	−0.002	0.007	−0.006	−0.029	−0.010	−0.034
	(0.010)	(0.017)	(0.010)	(0.017)	(0.015)	(0.028)	(0.015)	(0.028)
Quota compliance (t-3) * Post Equality Act		−0.012		−0.012		0.034	−0.010	0.034
		(0.020)		(0.020)		(0.033)	(0.008)	(0.033)
HHI (ln)			0.001	0.001			0.004	0.004
			(0.002)	(0.002)			(0.003)	(0.003)
Percentage of female managers in the Industry			−0.036*	−0.037*			0.024	0.024
			(0.020)	(0.020)			(0.031)	(0.031)
Firm age (ln)			0.003	0.003			0.001	0.001
			(0.004)	(0.004)			(0.001)	(0.001)
Board size (ln)			0.001	0.001			−0.009	−0.009
			(0.004)	(0.004)			(0.007)	(0.007)
Risk (ln)			0.001	0.001			−0.003	−0.003
			(0.002)	(0.002)			(0.004)	(0.004)
Firm size (ln)			−0.002	−0.002			−0.008***	−0.008***
			(0.002)	(0.002)			(0.003)	(0.003)
Constant	−0.012***	−0.013***	0.000	0.000	−0.004	−0.003	0.123	0.125
	(0.004)	(0.004)	(0.030)	(0.030)	(0.006)	(0.006)	(0.045)	(0.045)
Observations	2057	2057	2050	2050	2060	2060	2053	2053
Number of firms	745	745	745	745	745	745	745	745
Firm effects	RE	RE	RE	RE	RE	RE	RE	RE
Industry effects	No	No	Yes	Yes	No	No	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald chi2	10.75**	11.11**	26.42**	26.74**	7.21*	8.22*	38.87***	39.92***
p-value	(0.013)	(0.025)	(0.023)	(0.031)	(0.066)	(0.084)	(0.000)	(0.000)
Hausman Test	3.12	3.83	12.06	12.83	0.51	0.99	10.89	11.16
p-value	(0.374)	(0.429)	(0.210)	(0.233)	(0.916)	(0.910)	(0.283)	(0.345)

Notes: Standard error in parentheses. ***$p < 0.01$. **$p < 0.05$. *$p < 0.1$; Dependent variable is the increase in public income proportion over total income (columns 1–4) and the change in public sector contractor status (columns 5–8); Quota Compliance = 1 if the proportion of female directors is between 40 and 60 percent; Post Equality Act = 1 for years 2011 and 2014; HHI is the Herfindahl Index of income concentration by industry; Risk is the standard deviation of the return of assets over the previous ten years; Firm size is the firm total assets in thousand euros.

calls for tenders). Given that the EU-wide proposal quota design allows EU countries to mimic the Spanish quota, our results regarding Spain's "soft law" approach are timely and relevant.

The discussion of quotas on corporate boards aims to increase the pace of entry of women into the highest echelons of business. In many countries, hard quotas came after a long period of softer approaches failed to yield visible results. Indeed, countries that apply a hard quota often view this binding instrument as the fastest and easiest means of accelerating gender balanced boards. Regarding ongoing discourses about facilitating women's access to boards through quotas, a wide range of arguments can be identified, from social justice and equality to utility and the business case. The latter is usually used by quota advocates to help the business community to perceive the advantages of including women on boards. Seierstad (2016) advocated both utility and justice logics when discussing the value of diversity.

This diffusion process of the corporate board quota reform public debate across Europe after the enactment of the Norwegian quota can explain both the process itself and the national distinctive factors (Teigen, 2012). In particular for Spain, Teigen (2012) pointed to the shift in government in 2004 that led to a series of welfare policy reforms combined with the follow-the-leader diffusion mechanism as the main drivers for the corporate board quota law. Other important diffusion factor in the international debate of gender quotas is the role play by experts' statements. Indeed, the claim that female board representation positively affects firm financial performance (the business case for women) is a central argument promoted by policy makers for the quota reform, despite the inclusive academic evidence (Post & Byron, 2015). As we have seen in the Spanish case, the business case for women is not deemed as an important factor for the diffusion of public debate

and legal reform of the gender quota, causing companies' lack of interest for gender diversity. Finally, learning from the consequences of the tough sanctions attached to hard quota is also a driving force for the adoption of different systems of sections.
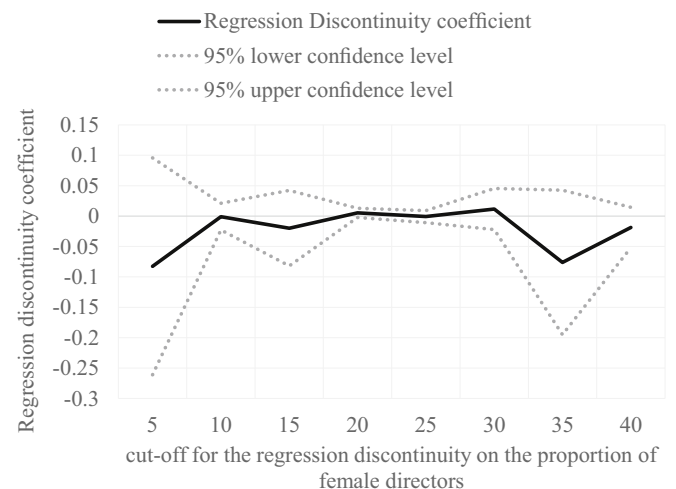
Fig. 2. Regression discontinuity analysis of the effect of proportion of female directors on the increase in public income dependence
Notes: Coefficients and confidence level intervals for regression discontinuity analysis of the proportion of female directors in change in public income dependence, before (mean of observed values in 2005–2008) and after (mean of observed values in 2011–2014) the Spanish Gender Equality Act. For each cut-off number, we estimated the regression discontinuity with a first order polynomial and a bandwidth optimally selected. Regressions include the same control variables we used in equations (1) and (2).

Nevertheless, in this regard, there is much variation between countries (Teigen, 2012). Indeed, Spain omitted sanctions in its legislation, largely due to the concessions made by the government to accommodate political and business groups.

This ongoing spread of corporate board quota legislation seems unstoppable as recently Portugal and Austria also implemented quotas. Given the market failures in the directors' market (Mateos de Cabo et al., 2011), gender quotas appear to be part of the solution, although they restrict business freedom.

7. Conclusion

Through our DiD analysis, we found that the Spanish Act falls short of its intended goals. There has been an increase of about 4pp in the share of female directors on those firms that are more dependent on public contracts and are, therefore, directly affected by the Act's promise of preference in public tendering (Article 34.2). As these companies started with a 6.7% proportion, the effect of the law represents a remarkable 60% increase, although this is not big enough to produce a balanced board. In contrast, for the whole sample of large companies covered by the Act (Articles 75 and 78), only a small annual growth of 0.5pp in female representation on Spanish boards from 2005 to 2014 can be noted. This growth cannot be directly attributed to the quota, as we do not observe a significant quantitative leap in this growth following its enactment. Given the slow increase in female directors, there are very few quota-compliant firms in Spain (roughly 5%).

We additionally find that quota-compliant firms do not significantly increase their income from public contracts, thus pointing to a lack of government commitment to the quota. This apparent lack of commitment may be attributed to institutional changes. In particular, the crisis and the change of government in 2011 shifted the debate focus from the demand-side to supply-side and pushed gender equality to a secondary place in national policies. This shift could imply that the positive effect of the Act may be put at risk if firms learn that gender balanced boards are not considered explicitly for the award of public contracts.

These results offer important implications. First, to improve effectiveness, policy stimuli should be aimed at all firms covered by the law, rather than at a subset (i.e., firms dependent on public contracts). Second, given the positive effect for public dependent firms, and in order to speed up the process, rewards/sanctions should be reinforced. The promise for a preference in the granting of government contracts is a weak incentive that has made limited progress, at least in the short and medium term. Indeed, recent studies on female directors (Armstrong & Walby, 2012; Piscopo and Clark-Muntean, 2018) recognized that the only policy intervention that significantly increases the proportion of women on boards is a binding legal instrument that enforces gender quotas.

In order to do this, it is important to build a critical mass of advocates and alliances to promote gender quotas, which were not present in Spain, precluding the effectiveness of the quota (Gabaldon & Giménez, 2017). Furthermore, given that quotas might not be enough on their own, accompanying measures to attain parity should be considered by the administration, especially those pertaining to work-life balance and sharing home duties more equally between men and women, which were also weak in Spain (Izquierdo et al., 2016).

Finally, the Spanish quota's limited progress may have been due to the government's lack of commitment to comply with the promise of prioritizing the awarding of public contacts to firms that achieve a gendered-balanced board. The stimulus should be immediate and effectively implemented in order to signal real political intent (Iannotta, Gatti, & Huse, 2016). In this sense, it is crucial to follow up on promised rewards/sanctions in order to advance gender equality.

To sum up, we can offer the following recommendations for increase women's presence on Spanish boards of directors. First, institutional political compromise can help to move faster the gender equality on boards. In fact, the new left-wing government has promised to revisit the Spanish legislation on board gender quotas, so there are possibilities that developments toward a hard-regulatory approach, or at least a hard quota threat, come back to the national agenda. Institutional complementarities, in particular those that come from public policies that foster higher paternity leaves and greater co-responsibilities in domestic tasks and care for dependents. It is remarkable that when searching for board members, only in 20%–30% of the occasions, Spanish listed companies chose professionals outside the circle of acquaintances of the president or of the one of a senior board member (Izquierdo et al., 2016). So, it seems necessary to professionalize the selection process to ensure that they are unbiased and that the best candidates and the best talent mix are getting to boards (this could lead to a code of conduct setting up the compromise between searches firms, to include women extensively). The creation of a business case for Spain would help Spanish companies to appreciate the advantages for getting women on boards from a wide and diverse talent pool, and finally, it would be also desirable more coordinated efforts of the different advocates for gender equality and the involvement of visible male politicians, businesses, and leaders that can show the benefits of creating teams which could ensure wide and comprehensive decision-making processes.

Before concluding, we acknowledge the important limitation of only examining a single country and policy, which might not be generalizable to other contexts. However, data from the Netherlands points to the same direction. According to the EIGE database, the increase in the proportion of women directors in 2004–2011 (before the Dutch soft quota) was a 1.84% per year, statistically identical to the 1.95% of the 2012–2017 post soft quota period. In fact, the Spanish quota is especially relevant given its similarities with the proposed EU directive, and can therefore be considered as a pre-test of the potential effects of the region-wide quota (if approved) in a small-scale experiment. Future research should examine the effectiveness of other quotas with different incentives and treatments. It would appear that the positive reaction of companies to the economic incentives (H2a and H2b) could easily be extrapolated to other contexts, but we are less certain with respect to the lack of response to the recommendation (H1a and H1b). Although the societal pressure that the Act produced was insufficient, it might be argued that in a different social context and/or under other political/economic circumstances this societal pressure may have been able to influence the informal processes in the director selection, as the Spanish legislators attempted.

Our results suggest other promising directions for future research. An emerging corporate governance theory explores how firms can express "governance deviance" by adapting practices outside the established national corporate governance framework (Aguilera, Judge, & Terjesen, 2018). Given observed differences amongst Spanish firms, future research could explore differences between subsets of firms, such as faster-complying firms and slower complying firms to the quota and other corporate governance legislation. Second, building on an extensive literature on human capital and social capital in board composition (e.g., Johnson, Schnatterly, & Hill, 2013), researchers could investigate similarities and differences in the characteristics of the new directors appointed following the quota compared to those directors already on boards. This research could identify potential "leaks in the pipeline" that reduce the pool of candidates.

Table 1B
Board diversity in Spanish firms

Year	Board directors	Female directors	Percent female directors	Boards without women	Boards with one woman	Boards with two women	Boards with more than two women
2005	4433	302	6.81%	73.94%	16.74%	5.35%	3.98%
2008	4147	365	8.80%	67.46%	20.85%	7.18%	4.51%
2011	3849	384	9.98%	66.04%	22.25%	6.50%	5.20%
2014	3911	454	11.61%	58.16%	28.25%	6.65%	6.95%

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