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Gendered language and board diversity: Evidence from European banks

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Abstract

Based on a sample of EU banks covering the period 2007 to 2021, I explore the impact of gendered language on bank board diversity policies. I find that gendered language negatively affects banks' gender diversity practices, especially after the passage of board reforms. Further, I find that rule of law and government efficiency explain the relationship, suggesting that these are useful mechanisms to reduce the negative effect of language gender-marking orientation on banks' gender diversity practices. However, results do not show a statistically significant effect of board gender diversity on riskiness of banks operating in countries with higher language gender orientation. My study provides a timely contribution to the literature by filling the gap regarding the importance of language gender-marking orientation in explaining banks' diversity practices and suggesting that regulators and institutions should take stronger actions aimed at reducing such cross-country heterogeneity. It also provides useful insights for EU regulators following the passage of the mandatory "Women on Boards" Directive in 2022.

KEYWORDS

bank risk, board gender diversity, boardroom reforms, gendered language

1 | INTRODUCTION

In a pioneering work published in 1859, Darwin (1859) affirms that the architecture of languages is a black box able of preserving information in a genome-like system. Similarly, cognitive science literature (Boroditsky et al., 2003) considers language as an aptitude that directly affects both cognitive and mental visualizations of reality, and thus how people think (Boroditsky, 2009).

According to recent research (Berman, Cano-Kollmann, & Mudambi, 2022; Berman, Mudambi, & Shoham, 2022; Bertrand et al., 2022; Dar & Sahu, 2022; Kwon et al., 2023; Santacreu-Vasut et al., 2014), gender language aptitude has been found to be a relevant cultural factor explaining gender gaps in access to credit (Bertrand et al., 2022), financial inclusion (Dar & Sahu, 2022), and non-financial firms' board diversity (Santacreu-Vasut et al., 2014), supporting cognitive science literature on the material impact of language on society.

Theoretically, sex gender is perceived as a stable construct of cultural language grammar, being a monolithic and unchanged aptitude over the centuries (Wichmann & Holman, 2009). Gendered language is therefore considered one of the most enduring connections between a country's past beliefs and the present, and it impacts on contemporary economic and social values (Shoham & Lee, 2018).

However, little is known about how gendered language shapes banks' behaviour towards gender-inclusive board practices in developed and regulated countries such as those in the EU.

The focus on EU countries is motivated by the widely recognized commitment of the European Commission (EC) to achieving higher levels of gender equality in financial institutions in the EU (Arnaboldi et al., 2020). Specifically, the EU's Institutional Framework implemented a range of policies aimed at enhancing the levels of gender inclusion and diversity on banks' executive boards, which also impacted national corporate governance rules in member countries.

However, the EC allowed member countries to freely adopt (or not) corporate governance codes and legislation, leading to a period of boardroom reforms which took place between 2007 and 2014. Consequently, heterogeneity abounded regarding boardroom reforms implemented in EU member states: some countries (e.g., Austria) adopted a recommendatory prescription about considering gender diversity in firm boards in 2009, while others (e.g., Finland) enacted a corporate governance code with broadly similar objectives. Moreover, the European Parliament enacted the Non-Financial Reporting Directive (EU NFRD hereafter) in, 2014, which required to listed companies working in EU to publish in an annual reports all non-financial activities, including those related to gender diversity issues. In 2022, all EU efforts to reach a higher presence of women on boardrooms became a reform proposal called the "Women on Boards" Directive.

Focusing on EU countries in this paper reduces cross-country institutional differences during a period which includes the end of the 2008–2012 global financial crisis (GFC) as well as the eruption of COVID-19 worldwide. This paper fills the existing gap by exploring how countries gender language aptitude affects banks' gender diversity practices and policies in the EU. While the effect of such policies has been widely explored (Arnaboldi et al., 2020; Cuomo et al., 2022; Fauver et al., 2022), no study has yet investigated how language gender-marking affects banks' gender inclusion policies and its interaction with board diversity reforms in Europe.

Consistent with value–belief theory (Triandis, 1995) and social identity theory (Tajfel & Turner, 1979), my findings reveal a negative effect of country language gender-marking on banks' diversity practices in Europe, supporting the literature on the real economic effect of such cultural factors. Moreover, as a mean of the differences-in-differences (DID) methodology, I find that the language gender-marking explains the successful of EU board diversity reforms passed during the 2007–2014 period, with banks headquartered in lower gender-marking countries experiencing more diverse boards after these reforms.

Additionally, my results reveal that countries' governance efficiency and rule of law channel the language gender-marking–bank board gender diversity relationship while suggesting useful strategies to reduce such cultural effects and a possible economic explanation of the documented nexus. Finally, I do not find any statistically significant improvement in terms of risk aptitude for more gender-diverse banks headquartered in countries with a higher prevalence of gendered language.

My findings provide new insights for the literature on banks' disclosures and regulation of board gender diversity. By addressing the literature and policy actions effectiveness gap, my paper provides important data-driven recommendations.

First, by providing empirical evidence of the effect of countries' use of gendered language on banks' board inclusion policies, I address the hotly debated question regarding the tangible effect of language culture on the real economy (i.e., Bertrand et al., 2022) by extending this emerging strand of research to the EU banking industry—which has recently become subject to new regulations—with the aim of filling this gap (Arnaboldi et al., 2020) and shedding light on possible—and underestimated—causes of difference in banks' gender inclusion levels in Europe. Therefore, the banking, corporate governance, and diversity literature are the first to benefit from these results.

Second, by showing that gendered language is a pivotal cultural aspect in explaining bank board gender inclusion, this study provides useful insights for regulators aiming to reduce the documented gender gap on bank boards by proposing that more heterogeneous directives be implemented according to the different level of language gender orientation (or language gender-marking) in a country. Specifically, my results suggest that regulatory authorities should pay greater attention to a country's cultural language orientation and try to design more stringent corporate governance reforms for countries with higher language gender-marking to address this gap in Europe.

Third, my study extends the literature on the mixed effectiveness of EU boardroom reforms by showing that their effectiveness changes depending on countries' language gender orientation, an aspect of cross-country differences that is little understood (Arnaboldi et al., 2020). Empirical evidence on board diversity reforms' effectiveness finds mixed results; thus, by adopting a quasi-natural experiment approach, my paper supports the need to consider cultural differences related to the use of gendered language during the regulatory design process and suggests a useful mechanism to reduce heterogeneity in EU countries in this regard. From a bank-specific perspective, the boardrooms of banks headquartered in countries with

higher language gender-marking should pay additional attention to increasing diversity and facilitating the transition to a more gender-inclusive workplace.

Finally, my study provides support for several moderating factors (i.e., rule of law and governance effectiveness) and bank consequences (i.e., risk aptitude) relevant to the literature on language gender-marking (Santacreu-Vasut et al., 2014) by showing how such channels mitigate the detrimental impact of countries' language culture and how board gender inclusion practices affect banks' soundness. Again, from a policymaker perspective, these results offer suggestions for regulators that may strengthen EU countries' rule of law and governance effectiveness, thus enabling them to achieve higher gender diversity on bank boards. Given that gendered language is a cultural factor requiring many years to be concretely changed, rule of law and government effectiveness are a smarter channel via which to address the documented gender diversity gap on which regulatory authorities should focus, especially considering the recent passage of the "Women on Boards" Directive. Given that the Directive will be mandatory by 2026, EU regulators should spend the intervening years avoiding a "one size fits all" approach and should instead tailor the "Women on Boards" Directive according to different countries' language gender-marking, thereby strengthening EU member states' rule of law and government effectiveness.

I structured the paper as follow. Section 2 details the literature review, theoretical framework, and main hypotheses. Section 3 illustrates the empirical framework, data, and database used. Section 4 details the empirical findings, Section 5 the robustness checks, and Section 6 the conclusions, suggesting possible policy implications for regulators.

2 | LITERATURE REVIEW, THEORETICAL FRAMEWORK, AND HYPOTHESIS DEVELOPMENT

In the years following the publication of the seminal work of Boroditsky et al. (2003), the notion that grammar and language orientation directly affect people's cognitive framework and thus their conceptualization of reality has steadily spread to the economics and business fields of research. According to value–belief theory (Triandis, 1995), there is an intrinsic relationship between ethical values and group members' behaviour and their actions' legitimacy (Freytag & Thurik, 2007), which ultimately impacts economic behaviour (Mueller & Thomas, 2001).

A key aspect distinguishing different cultures worldwide is the way they perceive different gender roles in civil society (Adams & Funk, 2012). The rationale behind this is that different languages' gender orientation should reflect the values society places on issues such as gender equality, women's board presence, and inclusion (Wright et al., 1995). Similarly, social identity theory considers gender as a social group, which directly affects differences in people roles and aptitude in society (Tajfel & Turner, 1979).

Therefore, gender is considered as a group of interest able to affect individuals' identity, determining roles, and capabilities (Shoham et al., 2020).

In recent years, to understand organizational processes, their development, and mechanisms, has also been adopted the social identity theory (Hogg, 2016).

Shoham et al. (2020), Berman, Cano-Kollmann, and Mudambi (2022), and Kwon et al. (2023) view social identity theory as a theoretical framework that explains how gender diversity affect merge and acquisition transactions determining economic outcome differences.

Stahlberg et al. (2007) defines language gender orientation by classifying language into three distinct categories regarding the frequency of references to gender: languages grammatically gendered, naturally gender, and genderless. For example, Spanish, Russian, and German are "grammatically gendered languages" while Scandinavian languages are "naturally gendered languages", as they contain a lower frequency of references to biological sex differences.

In this vein, language gender orientation has been found to be a relevant cultural aspect affecting gender quotas in political institutions (Santacreu-Vasut et al., 2013), gender gaps in employment (Mavisakalyan, 2015), gender gaps in access to credit (Bertrand et al., 2022), financial inclusion (Dar & Sahu, 2022; Osei-Tutu & Weill, 2021), the financial soundness of microfinance banking industry (Golesorkhi et al., 2019), innovation (Berman, Mudambi, & Shoham, 2022; Colladon et al., 2023), M&A activity (Berman et al., 2022a; Shoham et al., 2020), and non-financial firms' board diversity (Santacreu-Vasut et al., 2014), thus supporting a direct nexus between language culture and civil society.

Santacreu-Vasut et al. (2013), using the World Atlas of Language Structures (WALS) as a proxy of sex-gender differences in grammatical languages, find that language gender-marking is one of the most effective cultural characteristics in explaining gender quota adoption over other variables such as economic development, the country in question's political system, and religion. Similarly, Mavisakalyan (2015), using a sample of 108 countries worldwide, shows that regions in which the language spoken is more gender intensive tend to have a lower percentage of women's presence in the labour force and are characterized by a more gender-discriminatory attitude.

On the other hand, Berman, Mudambi, and Shoham (2022) distinguish language structure based on

grammatical gender-marking and how second and first-person pronouns are used, finding a statistically and significant correlation between language gender orientation and innovation output and performance. Similarly, Dar and Sahu (2022) confirms the existence of a statistically significant cross-country heterogeneity ascribable to gendered language.

From a firm-specific perspective, Bertrand et al. (2022) use the WALS database to explore how language gender-marking affect gender gaps determining cross-country credit access differences. By performing several regressions on a sample of 32,955 entities operating in 56 countries during 2009–2019, the authors find that language gender-marking negatively affects female access to bank credit, supporting the detrimental effect of language orientation on civil society.

The research most closely related to the aim of this paper is that of Santacreu-Vasut et al. (2014). They disentangle the average effect of language gender-marking intensity on women's corporate board presence worldwide in non-financial contexts. Using the WALS dataset to classify language gender-marking orientation and the World Values Survey to obtain data from corporate boards, the authors conclude that countries having higher language gender-marking show a statistically significant lower presence of women on boards and in management teams; they also have a smaller percentage of female-led corporate boards.

However, not either of these studies explores how and to what extent language gender-marking impacts bank board gender diversity in the EU which has recently taken strong actions regarding this issue. Therefore, based on value–belief theory and social identity theory, I fill this gap by proposing the following first hypothesis (H1):

> **H1.** Language gender orientation negatively affects banks' board gender diversity.

In recent years, EU institutions have taken the documented gender gap seriously by incorporating proposals and directives into their reform plans. As mentioned in Section 1, in 2010 the European Commission (2010) warned about the too low level of gender diversity and encouraged member states and the EU to implement policies aimed at fostering diversity in boardrooms (Arnaboldi et al., 2020). For example, in 2013 the EU launched the Capital Requirements Directive (CRD) IV (a list of reforms) whose scope is enhancing banks' corporate governance practices that support board gender diversity issues. However, despite the efforts of the EU institutions and consensus about the need for stronger actions on the gender issue, EU countries are free to adopt different strategies to address this issue.

Despite the effectiveness of mandatory and voluntary gender-based regulations, they remain a debated issue, and evidence regarding the adoption of a gender quota policy—in Norway, for example—suggests this has not led to an improvement in bank soundness (Bøhren & Staubo, 2016). However, in 2012 the EC passed a proposal stipulating that women should occupy a 40% share in boardrooms by 2020. Similarly, in 2022 the EC announced the passage of the "Women on Boards" Directive, which aims to prescribe a reliable and transparent recruitment process of EU firms, where at least the 40% of non-executives post or 33% of all directors' vacancies should be hold by the sex less represented (European Commission, 2022).

Supporters of mandatory requirements for gender diversity reforms argue that these would bring about two main benefits: (1) social and ethical benefits and (2) improvements in financial performance (Fauver et al., 2022). Among international institutions, the EU is one of the stronger supporters of all actions aimed to empower women leadership position, its effectiveness for economic development and competition in EU financial market (European Commission, 2012a, 2012b, p. 7).

Another major step taken by the EC is the passage of the EU NFRD in 2014 (which became mandatory after 2017); it mandates all publicly listed companies to disclose their socially responsible engagement, including on gender inclusion and diversity issues, especially on the management and supervisory boards (Directive 2014/95/EU).

A study by Bøhren and Staubo (2016) investigates how a mandatory gender balance reforms affects board independence. Using an unbalanced panel of Norwegian firms during the 2003–2008 period, the authors find that mandatory gender quotas positively affect firm board independence and diversity at the expense of economic value. However, other studies seem not to support the gender quota–performance nexus. Specifically, some argue that a mandatory gender quota leads to potential biases, since it affects firm owners' freedom to independently select candidates. From the financial performance perspective, Ahern and Dittmar (2012) disentangle the effect of the 2003 gender quota directive in Norway, concluding that on average there has been a decrease in financial performance following its passage. Consistently, based on a database of EU banks during the 2007–2014 period, Arnaboldi et al. (2020) observe an increase in bank returns and volatility, with this effect changing according to countries' legal systems and cultural aspects. However, little is known about whether and to what extent country language cultural factors play a role in affecting the implementation of bank board directives. More precisely, there is a gap regarding the importance of considering language gender-marking cultural characteristics when seeking to

achieve more diversity in bank boardrooms and targeting specific policy actions according to such heterogeneity. Therefore, to fill this gap, I propose the following second hypothesis:

> **H2.** Language gender orientation explains the success of boardroom diversity regulation in EU banks.

3 | RESEARCH DESIGN

To test the first hypothesis, I estimate the following ordinary least squares (OLS) model:

$$Board\,gender\,diversity_{i,t} = c + \beta_1 Lang\_gend_{i,t} + \beta_2 X_{i,t-1} + \upsilon_i + \gamma_i + \varepsilon_{i,t} \quad (1)$$

Board gender diversity (*Board gender diversity*) measures the level of banks' engagement on gender inclusion policies. Data on bank board gender diversity measures the percentage of women on boards and comes from Thomson Reuters Refinitiv (Chen et al., 2016; Fauver et al., 2022). It ranges between 0 (lowest level of diversity) to 100 (highest level of diversity).

Following Bertrand et al. (2022) and Santacreu-Vasut et al. (2014), the target variable is language gender-marking (*Lang_gend*), provided by the World Atlas Language Structures (WALS) database classification. It equals to 0 for countries with low gender-marking, 1 for middle gender-marking, and 2 for high gender-marking orientation. Therefore, the stronger the gender classification, the higher the value is.

In line with studies examining the determinants of bank gender diversity policy (Mateos de Cabo et al., 2012), I control for additional variables (vector *X* in the equation) that may be correlated with boardroom gender diversity, both bank-specific (namely size, the return on equity, the amount of gross loans, deposits, the cost to income ratio, a proxy of banks' ownership and amount of intangible assets)[1] and country-specific (inflation, gross domestic product, strength of gender regulation). Tables A.1 and A.2 (see Appendix A) describes bank- and country-level control variables and data sources.

The symbols υ_i, γ_i, $\varepsilon_{i,t}$ represent bank, time fixed effects, and the error term, respectively, while standard errors are clustered at bank-level; these are always tested individually or combined in the baseline model. Moreover, in the baseline model I also test different fixed effects combinations to capture bank-specific and cross-time-varying unobservable characteristics that may impact board gender diversity practises (such as bank and country*time fixed effects).

The second hypothesis aims at disentangling if and to what extent the effects of board reforms in the EU are dependent on language gender-marking. Therefore, I follow Arnaboldi et al. (2020) by testing these assumptions in a DID setting. Since board reforms were implemented over a relatively extended period (2008–2013, depending on members' choices) and at different points in time, I follow Arnaboldi et al. (2020) by using the dummy variable (*SHOCK*) which is equal to 1 for the country-specific year of the passage of the directive, and 0 otherwise (see Table 3). Specifically, France, Denmark, and the Netherlands introduced gender reforms in 2008; Austria, Belgium, and Germany followed in 2009; Lithuania, Poland, Iceland, and the UK in 2010; Greece and Italy in 2011; Iceland and Portugal in 2012; and Ireland in 2013. Others, such as the Czech Republic in 2007 had yet in 2007 a boardrooms diversity status (Arnaboldi et al., 2020). Therefore, the dummy *SHOCK* takes the value of 1 during these years for the corresponding countries, and 0 otherwise.

From an econometric perspective, I run the following OLS regression over the 2007–2017 period:

$$Board\,gender\,diversity_{it} = c + \beta_1 SHOCK + \beta_2 TREATED + \beta_3 SHOCK^{*} TREATED + \beta_4 X_{i,t-1} + \upsilon_i + \gamma_i + \mu_{it} \quad (2)$$

In this setting, treated banks are those headquartered in countries with lower language gender-marking, while all the others are controls. Therefore, the variable (*TREATED*) is equal to 1 for banks headquartered in countries with a language gender-marking score equal to 0, and 0 if equal to 1 or 2, and the variable *SHOCK*TREATED* is the interaction of *TREATED* and *SHOCK* variables. The coefficient of interest is *SHOCK*TREATED*, which captures the impact of neutral language gender-marking on bank boardroom diversity after the passage of gender reforms. Most importantly, since the enactment of such reforms varies across time and country, I test the results on many post-shock periods spanning from two to 4 years after the shock (from 2007 to 2015 and 2017). Then, as in Equation (1), I include both bank and time fixed effects and a list of bank-specific and country-specific characteristics (*X*).

I also run a traditional set of robustness checks (Heckman two-step and propensity score matching [PSM] weighted regression) strengthening the validity of the baseline inference and reducing endogeneity problems. Moreover, I also perform two falsification tests to corroborate the results of the DID regression.

3.1 | Identifying board reforms

As stated before (section 3), during the 2008–2014 period, EU countries passed a series of board reforms aimed at enhancing diversity. Due to the important level of heterogeneity regarding the timing of the implementation/adoption of such practices, it is not easy to identify a clear cut-off caused by the reforms. I strictly follow the work of Arnaboldi et al. (2020) and Fauver et al. (2022) by collecting all EU countries' statements regarding the passage of a recommendation or mandatory guidelines applicable to diversity issues and corporate governance codes, from European statements related to corporate governance best policies, EC, and the European Corporate Governance Institute (ECGI).

Since the focus of this paper is gender diversity in banks' boardrooms, I focus on all types of reforms that clearly aim at addressing gender inclusion issues for listed firms. For example, in 2009, the Austrian regulatory authority passed a recommendatory prescription about the need to consider all relevant aspects of diversity, as well as adequate sex genders representation on the supervisory board (Fauver et al., 2022). In 2010, Finland enacted a corporate governance code aimed at equally represents both genders on boards (Fauver et al., 2022). Spain took similar actions in 2007; Belgium and Germany in 2009; Denmark, France, and the Netherlands in 2008; the UK, Poland, and Iceland in 2010; Italy and Greece in 2011; Portugal in 2012; and Ireland in 2013.

As in Fauver et al. (2022), the reforms considered in my sample take the form of both legislation and corporate governance codes. Therefore, to capture banks' reactions to local directives, I do not distinguish between mandatory and recommended/suggested corporate governance codes; thus, I select the first corporate governance code or legislation passed during the period of analysis and include it in Equation (2). Table 1 lists the year of boardroom reforms in selected countries and their language gender-marking, as shown in recent literature (Arnaboldi et al., 2020; Fauver et al., 2022).

3.2 | Measurements

In this section, I explain in detail the source and measurement of all variables used in the paper. Table A.2 sums up all this information.

3.3 | Dependent variable: Board gender diversity

I use data on the board gender diversity measure of EU banks, as provided by Thomson Reuters Refinitiv database during the 2007–2021 period. Board gender diversity is a variable measuring the percentage of women on the board, ranging from 0 (no gender diversity) to 100 (highest level of gender diversity). In the robustness test I use additional variables such as the gender pay gap score, executive gender diversity policy, policy on gender diversity, and policy on gender diversity and opportunity. The adoption of such variables to account for gender diversity follows the existing literature (Chen et al., 2016; Fauver et al., 2022) and is in line with analysts and institutions working on this field. The final dataset includes 89 listed banks headquartered in 25 countries in the EU (see Table 1) during the 2007–2021 period.

3.4 | Target variable: Language gender orientation

In their seminal work, Corbett (2013) clarifies the existence of a theoretical distinction between language system based on a grammatical sex classification (sex-based) from others (non sex-based). In sex-based language systems, there is perfect correspondence between the grammatical framework and the related semantic category. For example, in Dravidian languages, we notice a bidirectional relationship between masculine nouns, which denote males, and vice-versa. On the other hand, in European languages such as French and Russian, nouns indicating males are usually masculine; however, masculine nouns do not denote only males, but also others (Corbett, 2013).

In non-sex-based grammatical systems, biological sex does not always correspond to the corresponding semantic category. Specifically, these grammatical systems are mainly based on the notion of "animacy", a semantic feature aimed at clarifying if and to what extent a noun refers to living things. An example of non-sex-based systems are Turkish and Finnish, where nouns and pronouns are not specified by their biological sex.

However, since this paper focuses on the EU, all banks are headquartered in countries with a sex-based grammatical system. Therefore, to account for different language gender orientations, I strictly follow the literature on this topic (Bertrand et al., 2022; Mavisakalyan, 2015; Santacreu-Vasut, 2014) by using data from WALS (Dryer & Haspelmath, 2013), which provides language gender-marking (*Lang_gend*, the target variable) data for a list of countries worldwide. More precisely, the database assigns a value from 0 (lower language gender-marking) to 2 (higher language gender-marking) for countries worldwide, accounting for the strength of cultural language gender orientation.

According to recent literature (Bertrand et al., 2022; Santacreu-Vasut et al., 2014), language gender-marking is the most useful variable to account for gendered language intensity; it has been found to negatively affect women's

TABLE 1 Sample description, language gender marking distribution and board reforms adoptions.

Country	N. of Obs.	%	Lang_gend	Year of diversity reform adoption
Austria	35	4.04	1	2009
Belgium	14	1.62	1	2009
Cyprus	2	0.23	0	
Czech Republic	19	2.19	1	2007
Denmark	53	6.12	1	2008
Finland	20	2.31	0	2010
France	42	4.85	1	2008
Germany	30	3.46	1	2009
Greece	56	6.47	1	2011
Hungary	13	1.50	0	NA
Iceland	2	0.23	0	2012
Ireland; Republic	28	3.23	1	2013
Italy	100	11.55	1	2011
Netherlands	15	1.73	1	2011
Norway	33	3.81	1	2008
Poland	113	13.05	1	2010
Portugal	14	1.62	1	2012
Romania	9	1.04	1	NA
Spain	72	8.31	2	2007
Sweden	49	5.66	1	NA
Switzerland	31	3.58	1	NA
United Kingdom	116	13.39	1	2010

Note: This table shows the distribution of observations across countries, the respective language marking, and the year of board reform adoption.

inclusion and representation worldwide. The rationale behind states on the evidence that sex gender is considered as a strongly stable feature of language grammar; it is often monolithic in nature and unchanged for millennia (Wichmann & Holman, 2009). Therefore, language gender-marking should be considered one of the most reliable means identifying long-established ancestral beliefs that directly affect contemporary economic and social values (Shoham & Lee, 2018). Table 1 shows the classification of EU countries' language gender-marking as provided by the WALS database.

3.5 | Control variables

Finally, I include a set of bank- and country-relevant variables usually correlated with diversity and bank soundness and follow previous research (Chen et al., 2016; Chiaramonte et al., 2021; Cuomo et al., 2022) by using the Thomson Reuters Refinitiv database to obtain balance sheet data. Size proxied as as the natural logarithm of total assets, the return on equity (Roe), gross loans scaled by total asset ratio (Gl_ta), the deposit loans divided by total loans (Dep_Loans), the cost to income ratio (Cir), the amount of total intangible asset scaled by total assets (Int_Ass), the ownership structure taking values of 1 for government, 2 limited liability, 3 cooperative/mutual, and 4 for stock corporation structure (Ownership) as well as the World Bank database for country-specific one (the gross domestic product growth rate (Gdp_grw), inflation rate (Infl), and the presence or not of gender quota regulation (D_Quota) (Arnaboldi et al., 2020)).

4 | EMPIRICAL ANALYSIS

4.1 | Descriptive statistics

Table 2 describes the 25p, mean, median, and 75p values of all variables used in the analysis. The board gender

TABLE 2 Descriptive statistics.

Variables	Mean	Median	St. Dev.	P25	P75
Board Gender Diversity	0.210	0.1904	0.154	0.083	0.333
Lang_gend	0.419	0	0.546	0	1
Size	16.1478	16.1324	2.3169	14.52461	17.43866
Roe	0.062	0.071	0.101	0.041	0.106
Gl_ta	0.669	0.704	0.168	0.581	0.798
Dep_loans	0.987	0.868	0.592	0.706	1.139
Cir	0.613	0.586	0.173	0.505	0.685
Int_ass	0.004	0.002	0.007	0.0002	0.006
Ownership	3.641	4	0.619	3	4
Gdp_grw	0.011	0.014	0.032	0.185	0.026
Infl	0.018	0.018	0.016	0.774	0.025
D_Quota	0.189	0	0.495	0	0.80

Note: This table summarize the average, median, P25 and P75 distribution of all variables used in the sample.

diversity score has a mean value of 21% (0.21), which indicates the need for stronger action to achieve gender parity in the boardrooms of EU banks. The lower value (p25) is 8% (0.08) and the higher value (p75) is 33%, again confirming the existence of too low a gender balance in EU banks, as shown by Fauver et al. (2022).

As for the target variable, I observe that the sample is broadly balanced: a higher number of banks are headquartered in countries with middle language gender-marking (value of 1) and the 25p with low language gender-marking. As mentioned before, the lower the level of language gender-marking, the higher the neutrality of the grammatical system in a country (Bertrand et al., 2022). Finally, all control variables are in line with previous research exploring similar topics in EU banks (Arnaboldi et al., 2020).

Figure 1 plots the distribution of the board gender diversity across different levels of language gender-marking during the 2007–2021 period in Europe. Besides is a graphical representation, it seems to support my first hypothesis (H1): the higher the language gender-marking, the lower the average distribution of board gender diversity.

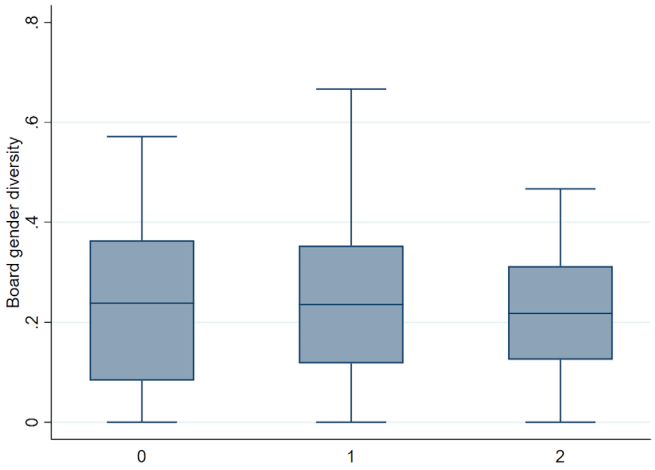

FIGURE 1 Board gender diversity across language gender-marking intensity. This figure shows the distribution (minimum, p25, median, p75 and maximum) of board gender diversity according to low language gender marking (0), middle gender-marking (1) and high gender-marking during the period 2007–2021. [Colour figure can be viewed at wileyonlinelibrary.com]

4.2 | Baseline regression analyses

Table 3 shows the result of the main model. Specifically, the variable *Lang_gend* (the target variable) is negative and statistically significantly correlated with *Board gender diversity* (the dependent variable) in all econometric specifications (with/without including time, bank, and country fixed effects), thus confirming the existence of a negative correlation between language gender-marking and gender diversity in the boardrooms of EU banks.

I find that the average difference in boardroom diversity between the lowest (equal to 0) and highest (equal to 2) gender language-marking country spans from 2% (Table 3, column 1) to 9% (for the bank and country*time fixed effects model; Table 3, column 3), suggesting a strongly significant effect of the target variable on banks' board diversity.

These findings support the predictions of value–belief theory, where grammatical gender orientation affects people's thinking as well as the representation of genders in society (Bertrand et al., 2022). Specifically, as stated in value–belief theory (Triandis, 1995), there is a pertinent

TABLE 3 Baseline model.

	Board gender diversity			
Variables	**(I)**	**(II)**	**(III)**	**(IV)**
Lang_gend	−0.0757***	−0.284***	−0.413**	−0.169***
	(0.001)	(0.0256)	(0.186)	(0.0354)
Size		0.000108	0.0131	−0.000603
		(0.00946)	(0.0140)	(0.0117)
Roe		0.00530	0.0614	0.0725*
		(0.0395)	(0.0474)	(0.0385)
Gl_ta		0.0610	−0.000202	−0.0282
		(0.130)	(0.137)	(0.122)
Dep_loans		0.0199	−0.0333	−0.0281
		(0.0377)	(0.0371)	(0.0330)
Cir		0.0404	0.0163	0.0300
		(0.0498)	(0.0639)	(0.0481)
Int_ass		−2.175**	−0.958	−1262
		−1.040	−1092	(0.995)
Ownership		−0.160***	0.0159	−0.194***
		(0.0244)	(0.134)	(0.0227)
Gdp_grw		−0.00340***	−0.0119	−0.00465***
		(0.000854)	(0.0113)	(0.00161)
Infl		0.00614	0.134	0.00520
		(0.00391)	(0.126)	(0.00569)
D_quota		0.0995***	0.201***	0.0106
		(0.0121)	(0.0593)	(0.0245)
Bank fe	Yes	Yes	Yes	Yes
Year fe	No	No	No	Yes
Country*year fe	No	No	Yes	No
Cluster S.E Bank	Yes	Yes	Yes	Yes
Observations	1142	866	866	866
R-squared	0.442	0.679	0.852	0.762

Note: This table reports the estimates Equation (1) for 2007–2021. The dependent variable is *board gender diversity*. The variable of interest is the Language gender-marking (Lang_gend) – without control variables column (I); and different fixed effects combination – columns (II), (III), (IV).***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

connection between ethical purposes and individuals' behaviour (Freytag & Thurik, 2007), as well as on perceptions of gender roles and the respective economic ability. My results are also supported by literature that finds a pivotal role is played by individuals' language structure and its consideration of sex genders, since it tends to lead people to act according to a specific framework for classifying experience (; Hoijer, 1954; Slobin, 1991, p. 7), thus influencing human relationships.

Put simply, the results indicate that a country's language structure should be considered as a linguistic construct rather than merely a tool for communication. This is in line with Berman, Mudambi, and Shoham (2022): unspoken and cultural attitudes tend to be embedded in a country's language structure, which finally manifest in different levels of economic representation for women and reduced diversity in boardrooms. Therefore, supported by value–belief theory, social identity theory, and recent studies (Berman, Mudambi, & Shoham, 2022; Bertrand et al., 2022; Santacreu-Vasut et al., 2014), my baseline results confirm the importance of language gender-marking in explaining cross-country boardroom diversity policies.

As for the control variables, Table 3 is in line with the literature (Oliveira & Zhang, 2022) and shows that the

TABLE 4 Difference in difference regression.

	Board gender diversity			
Variables	**(I)**	**(II)**	**(III)**	**(IV)**
TREATED*SHOCK	0.0505**	0.0790***	0.0896***	0.100***
	(0.0231)	(0.0298)	(0.0292)	(0.0261)
TREATED		0.142***	0.172***	0.169***
		(0.0331)	(0.0354)	(0.0340)
SHOCK		−0.0303**	−0.0297**	−0.0283*
		(0.0145)	(0.0145)	(0.0145)
Controls	No	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes
Cluster S.E Bank	Yes	Yes	Yes	Yes
Observations	574	574	511	452
R-squared	0.734	0.748	0.752	0.754

Note: This table shows the difference in difference regression result for 2007–2016. The dependent variable is *board gender diversity*. TREATED is the variable of interest, which equals to 1 for banks headquartered in countries with lower Language gender-marking, and 0 if headquartered in countries with higher marking; the variable SHOCK, equals to 1 for the specific year of implementation of board reform, and 0 otherwise; the variable TREATED*SHOCK, which capture the effect of the SHOCK for our group of interest. Column (I) includes only the main variable of interest; while different event windows combination (+4; +3; +2) are reported in columns Column (II), (III) and (IV) respectively. Specifically, Column (II) includes the sample until 2017 (+4); Specifically, Column (III) includes the sample until 2016 (+3); Specifically, Column (IV) includes the sample until 2015 (+2). ***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

amount of intangible assets (Intangible), different ownership (Ownership), country gross domestic product (GDP_Grw), and country gender quota adoption (D_Quota) are all significantly correlated with banks' board gender diversity in Europe.

Table 4 shows the results of the DID regression used to investigate hypothesis H2. More precisely, it reveals the positive and statistically significant relationship between *TREATED*SHOCK* and the degree of banks' boardroom diversity, supporting the marginal effect of language gender-marking on diversity policies after gender reforms. Specifically, the positive marginal effect for *TREATED* banks varies between 23% (for the model without controls) and 41% (for the full controls and fixed effects model) highlighting the economic significance of these cultural variables.

My results corroborate, once again, the nexus posited in H2 between country language gender-marking and banks' boardroom diversity. Language culture seems to be a significant variable in explaining higher (lower) bank diversity policy in Europe, especially in determining the success (failure) of board reforms. More precisely, Table 4 shows that the implementation of a board directive has a positive and statistically significant effect for banks headquartered in countries with lower language gender-marking (*TREATED*), confirming that the less gendered the gendered language is, the higher the bank's diversity engagement. Again, this result supports previous studies on the effectiveness of such directives (Arnaboldi et al., 2020) and the relevance of language gender-marking for the real economy (Santacreu-Vasut et al., 2014). In addition, Table 4 reveals the existence of cultural cross-country heterogeneity (language gender-marking), which must be addressed to increase board reform effectiveness.

5 | ADDITIONAL TESTS AND ROBUSTNESS CHECKS

In section 5, I run further tests and robustness checks aimed at disentangling the economic channel behind the language gender-marking and board diversity nexus as well as how it affects banks' soundness. To do so, I perform a set of robustness checks, namely a placebo DID test, the Heckman two-stage regression, and PSM.

5.1 | The channel of rule of law and government efficiency

Evolutionary linguists state that the existence of different gender distinctions in human languages should be

TABLE 5 Economic channel analysis: the role of Institutional factors.

Variables	Rule of law (I)	Gov_eff (II)	Board gender diversity (III)	Board gender diversity (IV)
Lang_gend	−0.788***	−0.608***	−0.232**	−0.479***
	(0.0186)	(0.0205)	(0.0980)	(0.107)
Lang_gend*Gov_eff			0.0804*	0.0977**
			(0.0442)	(0.0439)
Lang_gend*Rule of law			0.0951*	0.0972*
			(0.0504)	(0.0502)
Controls	Yes	Yes	No	Yes
Country fe	Yes	Yes	No	No
Bank fe	No	No	Yes	Yes
Year fe	Yes	Yes	Yes	Yes
Cluster S.E Bank	No	Yes	Yes	Yes
Observations	768	768	849	768
R-squared	0.779	0.771	0.755	0.774

Note: This table shows the economic channel analysis estimates for 2007–2021. The variable of interest is the Language gender-marking (*Lang_gend*). The dependent variable in column (I) and (II) are the *Rule of law* and Government effectiveness (*Gov_eff*) respectively, while in columns (III), (IV) is the *board gender diversity*. Columns I and II include country and time fixed effects; Columns III and IV, include bank and time fixed effects with and without control variables, respectively. ***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

considered as an important marker for biological sex distinctions which are directly translated into different gender stereotypes mirroring discrimination and different perceptions of women in societies (Johansson, 2005). Falck et al. (2012) support this view of human language, arguing that it must be viewed as one of the "best measurable indicators of cultural differences" due to its persistence over time and impact on economic behaviour. In this vein, language has also been considered an "institution" (Sampson et al., 2009) which shapes civil society and cultural heritage as well as other cultural institutions like religion.

Given that language impacts cultures and traditions, it is reasonable to expect that it directly affects institutions and their welfare economics approach. Shoham and Lee (2018) finds a direct nexus between language gender-marking and women's labour participation and female wage inequality. Consequently, the authors find that the higher the gender-marking in a language, the lower the level of country equality is. Therefore, the gender inequality derived from language marking has been found to be strongly associated with political institutions' quality and legal rights, thus supporting the existence of a direct nexus with country institutional and legal origins (Htun & Weldon, 2011).

Given that language has been shown to have a direct impact on gender attitudes in civil society' (Bertrand et al., 2022; Shoham & Lee, 2018), I test whether any institutional economic factors may channel the language gender-marking–board gender diversity relationship. As argued by Piketty (2014), the variables that most affect societal inequality, such as gender, should be found exogenously from firm-specific factors, such as institutions.

Specifically, in Table 5, I run a channel regression analysis to investigate whether rule of law and government efficiency help in explaining the language gender-marking–bank gender diversity relationship.[2] Specifically, as in Cuomo et al. (2022), I obtain data on rule of law and government effectiveness from the World Bank database. While the rule of law measures the citizen perception of the rules of society, the efficiency of contracts, adequate functioning of property rights, the courts (Kaufmann et al., 2010), the government effectiveness proxies the perception of efficiency of citizens' services, and governments' commitment to strengthen the quality of public wellbeing (Kaufmann et al., 2010). Therefore, these variables are appropriate for use when considering differences in institutional quality in relation to language gender-marking and trying to understand if and to what extent these factors may represent viable economic channels.

In columns 1 and 2 of Table 5, I find that the variable *Lang_gend* is strongly negatively and statistically significantly correlated to countries' rule of law and government effectiveness (*Gov_eff*), suggesting that the higher the language gender-marking, the lower institutional

TABLE 6 The effect on bank risk taking.

Variables	RWA (I)	NPL_GL (II)	NPL_TA (III)
Lang_gend*Board gender diversity	−0.0763	−0.0536	−0.0232
	(0.0532)	(0.0327)	(0.0231)
Board gender diversity	0.0643	0.0847*	0.0433
	(0.0714)	(0.0427)	(0.0323)
Lang_gend	−0.0505*	0.00446	0.00835
	(0.0302)	(0.0172)	(0.0111)
Controls	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes
Year fe	Yes	Yes	Yes
Cluster S.E Bank	Yes	Yes	Yes
Observations	854	752	752
R-squared	0.825	0.890	0.886

Note: This table shows the bank risk taking effect for 2007–2021. The variable of interest is the Language gender-marking (*Lang_gend*). The dependent variable in column (I), (II) and (III), are the risk weighted asset (RWA), non-performing loans scaled by gross loans (NPL_GL) and scaled by total asset (NPL_TA) respectively. ***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

quality is. Then, in columns 3 and 4 of Table 5, I find that the interaction between *Lang_gend* and *Rule of law* and *Gov_eff* is positive and statistically significant, suggesting the existence of a channel and moderating the relationship with bank board gender diversity. More precisely, Table 5 seems to support the relevance of *Rule of law* and *Gov_eff* in determining the detrimental effect of language gender-marking on banks' board gender diversity, since *Lang_gend* negatively affects both institutional quality variables and thus banks' board gender diversity.

This result highlights the importance of institutional variables in reducing the negative effect of cultural aspects such as language, suggesting that they are a useful mechanism through which to alleviate language gender-marking's detrimental consequences on banks' board gender diversity. At the same time, this result empirically proves that language gender-marking negatively affects *Rule of law* and *Gov_eff* and thus banks' board gender diversity.

5.2 | Implications for banks risk taking behaviour

The agency theory framework states that when human capital in boardrooms is not well-diversified, the CEO tends to take less risky actions (Abou-El-Sood, 2021). However, beyond the ethical aspects of being highly gender diverse, persists a remarkable lack of clearness about the real nexus between board gender diversity and financial soundness. For example, Keltner et al. (2003) find that a woman CEO is considered less powerful compared to other board members, since she is more prone to be affected by threats in the workplace. Consequently, the prediction of performance is negative. On the other hand, Gulamhussen and Santa (2015) find that women are, on average, less risk-takers in their investment decisions, especially in placing greater importance on downside risk (Olsen & Cox, 2001). This is empirically supported by Abou-El-Sood (2021), who—in line with the agency theory expectations—finds that the higher the share of women directors, the lower banks' risk-taking behaviour is.

Mohsni et al. (2021), while exploring the how board gender diversity affects firms' financial stability in 27 developing countries, confirm the presence of both risk reduction and a positive performance effect for non-financial firms. However, the authors find that countries' cultural factors such as masculinity reduce the effect of such policies, highlighting the detrimental impact of specific cultural factors. Interestingly, Mohsni et al. (2021) find only a temporary effect of board gender diversity on firm risk, which decrease in the years after its establishment.

Kinateder et al. (2021) analyse a sample of banks during the 2006–2017 period and support the positive nexus between board gender diversity and financial stability. Additionally, they find that an increase of one standard deviation in boardroom diversity tends to, on average, increase the distance to default from 38% to 50%, thereby highlighting the economic relevance of diversity practices. The rationale behind this finding is the lower risk-

TABLE 7 Heckman two-step.

	Board gender diversity		
Variables	**(I)**	**(II)**	**(III)**
Lang_gend	−0.293***	−0.439**	−0.188*
	(0.0833)	(0.210)	(0.112)
IMR	−0.0575	−0.0764	−0.127
	(0.0612)	(0.0578)	(0.0821)
Controls	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes
Year fe	No	No	Yes
Country*year fe	No	Yes	No
Cluster S.E Bank	Yes	Yes	Yes
Observations	876	876	876

Note: This table shows the Heckman two-step regression output for 2007–2021. The dependent variable is *board gender diversity*. The variable of interest is the Language gender-marking (Lang_gend) – with different fixed effects combination. Specifically, Column I include bank fixed effect only; Column II includes include bank and time*country fixed effects; Column III include bank and time fixed effects. ***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

TABLE 8 PSM regressions.

	Board gender diversity		
Variables	**(I)**	**(II)**	**(III)**
Lang_gend	−0.293***	−0.570**	−0.179***
	(0.0269)	(0.245)	(0.0380)
Controls	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes
Year fe	No	Yes	Yes
Country*year fe	No	No	No
Cluster S.E Bank	Yes	Yes	Yes
Observations	849	849	849
R-squared	0.729	0.872	0.809

Note: This table shows the estimates of PSM regression for 2007–2021. The dependent variable is *board gender diversity* which measures bank boardrooms diversity. The variable of interest is the Language gender-marking (Lang_gend) – with different fixed effects combination, Column I, II and III. **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

taking aptitude of women compared to men, which is well documented in the behavioural finance stream of research.

However, many other studies reports conflicting results (Adams & Funk, 2012; Ahmed & Atif, 2021; Deaves et al., 2009; Sila et al., 2016; Trinh et al., 2021). For example, Adams and Funk (2012) state that risk-averse behaviour is mainly an individual characteristic, and thus it is unlikely to be impacted by gender differences. In this vein, Deaves et al. (2009) show that there is no significant difference in investment overconfidence between women and men; thus, the relationship with risk seems to be unsupported, while on examining equity risk, Sila et al. (2016) find an absence of any statistically significant correlation with board gender diversity, arguing that any possible results may be driven by unobservable firms covariates instead of those related to gender. Thus, how bank board gender diversity affects risk-taking practices in higher language gender-marking countries remains an open question; therefore, I test this relationship in Table 6. Specifically, as a mean of the interaction terms between *Lang_gend* and *Board gender diversity*, I investigate whether any statistically significant correlation exists between banks' risk-weighted assets (RWA) and non-performing loans (NPL), which are commonly used risk-taking proxies in the banking industry (Abou-El-Sood, 2021).

Table 6 shows the results of this additional analysis, suggesting the absence of any statistically significant correlation between the target variable (*Lang_gend*Board gender diversity*) and banks' risk-taking practices. Therefore, despite the growing debate about the existence of positive correlation between highly gender diverse boards and risk-taking performance, I do not find any statistically significant difference between high language gender-marking countries and boardroom diversity in terms of risk appetite behaviour.

5.3 | Robustness tests

Further, I perform a set of alternative econometric models aimed at strengthening the validity of the baseline results.

First, since the construction of the sample depends on the availability of data for the dependent variable (*Board gender diversity*), the banks included in the analysis are not randomly selected. Therefore, a common econometric approach used in banking, finance, and corporate governance literature (Chiaramonte et al., 2021; McGuinness et al., 2017) to solve this issue is running the Heckman two-step regression (Heckman, 1978). As argued by McGuinness et al. (2017), sample selection bias is one of the most important sources of endogeneity and may ultimately affect the validity of coefficient estimations. Therefore, I perform the Heckman two-step regression (Heckman, 1978) to control for the existence of such sources of endogeneity.

In the first step, I run a probit model using *Lang_gend* as a dependent variable, obtaining the Inverse Mills

TABLE 9 Placebo tests.

Panel A				
	Board gender diversity			
Variables	**(I)**	**(II)**	**(III)**	**(IV)**
TREATED*PLACEBO_SHOCK	−0.0247	−0.00416	−0.00235	0.00493
	(0.0551)	(0.0511)	(0.0492)	(0.0449)
TREATED		0.125***	0.156***	0.169***
		(0.0382)	(0.0378)	(0.0348)
PLACEBO_SHOCK		−0.0209	−0.0187	−0.0135
		(0.0129)	(0.0125)	(0.0117)
Controls	No	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes
Cluster S.E Bank	Yes	Yes	Yes	Yes
Observations	574	574	511	452
R-squared	0.733	0.748	0.752	0.752
Panel B				
	Board gender diversity			
Variables	**(I)**	**(II)**	**(III)**	**(IV)**
TREATED*PSEUDOSHOCK	0.0397	−0.0222	−0.00879	−0.0121
	(0.0340)	(0.0409)	(0.0318)	(0.0360)
TREATED		0.266***	0.203***	0.181***
		(0.0408)	(0.0366)	(0.0339)
PSEUDOSHOCK		0.0376**	0.0392***	0.0318**
		(0.0172)	(0.0142)	(0.0146)
Controls	No	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes
Country*year fe	Yes	Yes	Yes	Yes
Cluster S.E Bank	Yes	Yes	Yes	Yes
Observations	337	337	393	452
R-squared	0.779	0.794	0.767	0.755

Note: This table shows the placebo test regression output for 2007–2016 (A and B). In *panel A* the dependent variable is *board gender diversity* which measures bank boardrooms diversity. TREATED is the variable of interest and equals to 1 for banks headquartered in countries with lower Language gender-marking, and 0 if equal to 1 and 2; the variable PLACEBO_SHOCK, equals to 1 for the year before the implementation of board reform, and 0 otherwise; the variable TREATED*PLACEBO_SHOCK, which capture the effect of the SHOCK for our group of interest. Column (I) includes only the main variable of interest; while different event windows combination (+4; +3; +2) are reported in columns (III) and (IV) respectively (*Panel A*). *Panel B* shows a second placebo test only during the period before the final implementation of all board reforms (2014). The dependent variable is *board gender diversity* which measures bank boardrooms diversity. TREATED is the variable of interest and equals to 1 for banks headquartered in countries with lower Language gender-marking, and 0 if equal to 1 and 2; the variable PLACEBO_SHOCK, equals to 1 for a random choice of a year before the implementation of board reform, and 0 otherwise; the variable TREATED*PLACEBO_SHOCK, which capture the effect of the SHOCK for our group of interest. Column (I) includes only the main variable of interest; while different event windows combination (+4; +3; +2) are reported in columns (III) and (IV) respectively. Specifically, Column (II) includes the sample until 2017 (+4); Specifically, Column (III) includes the sample until 2016 (+3); Specifically, Column (IV) includes the sample until 2015 (+2). ***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

TABLE 10 Alternative measures of gender diversity.

Variables	Pay gap score (I)	Executive gender diversity (II)	Policy gender diversity (III)	Policy diversity and opportunity (IV)
Lang_gend	−0.0548**	−0.473***	−0.598***	−0.209**
	(0.0230)	(0.0284)	(0.119)	(0.104)
Controls	Yes	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes	Yes
Year fe	Yes	Yes	Yes	Yes
Cluster S.E Bank	Yes	Yes	Yes	Yes
Observations	1263	869	823	870
R-squared	0.348	0.738	0.728	0.559

Note: This table shows the estimates of Equation (1) for 2007–2021 with alternative dependent variables. The dependent variable is Pay gap score, Executive gender diversity score, Policy gender diversity and Policy diversity and opportunity. The variable of interest is the Language gender-marking (Lang_gend). All columns include bank and time fixed effects.***, **, and * signals 1%, 5%, and 10% levels of statistical difference from zero of coefficients, respectively.

Ratio (IMR). Second, I rerun the baseline specification (Equation (1)) adding the IMR as additional independent variable (Li & Prabhala, 2007). Table 7 confirms the lack of bias in the baseline model, supporting the existence of a negative and statistically significant correlation between language gender-marking and boardroom diversity in EU banks.

Second, despite the Heckman two-step regression, an unobservable source of heterogeneity may still be present in the estimations. Specifically, my results may be led by unobserved cross-country and bank-specific differences caused by banks being or not being headquartered in countries with higher (lower) language gender-marking. A common way to overcome this additional potential issue is performing a PSM weighted regression, which ensures the reduction of biases resulting from unobserved heterogeneity between banks in the sample. Put simply, unlike in controlled experiments, the obtained coefficients may be biased by overlooked unobservable confounding factors, which in my empirical research question are represented by the strategic decision to improve the level of gender diversity engagement in line with unobservable country-specific aptitudes which finally determine banks' boardroom diversity. I tackle this possible bias following Chen and Matousek (2020) and run a PSM weighted regression controlling for the existence of unobserved heterogeneity between low (control banks) and high (treated banks) language gender-marking countries.

Table 8 shows the consistency of the baseline model after running a PSM weighted regression, strengthening the validity of the language gender-marking and bank boardrooms diversity nexus.

Third, I test the impact of language gender-marking in determining corporate governance reforms' effectiveness in Europe. However, an additional concern arising from the use of quasi-natural experiments in the financial literature is the presence of possible "anticipatory" effects of reforms on the observed dependent variable, which may skew the final interpretation of the experiment. Therefore, in Table 9 I test the validity of Equation (2) (the DID regression) by performing two falsification tests.

The former follows Cuomo et al. (2022) and consists of setting the time of the shock to the year before the true event data to assess whether there is an any anticipatory effect on the outcome variable (board gender diversity). Panel A, Table 9 sum up the result of this placebo test, confirming the absence of a statistically significant correlation with the *TREATED*PLACEBO SHOCK* variable and thus of any anticipatory effect of board reforms. Following Arnaboldi et al. (2020), in the second placebo test, I set the *PLACEBO SHOCK* year to 3 years before the true shock then run the regression on the pre-shock period sample (2007–2014). Again, looking at the variable of interest (*TREATED*PLACEBO SHOCK*), I observe the lack of a statistically significant correlation, thus corroborating the validity of the main model in Equation (2).

Fourth, I rerun my baseline model by proxying banks' boardroom diversity using the following alternative variables: the gender pays gap score, the executive gender diversity score, the policy gender diversity score, and the policy diversity and opportunity score, as provided by Thomson Reuters Refinitiv. All these measures are ratings ranging between 0 (lower level) and 1 (higher level). Table 10 summarizes this additional test, showing that the *Lang_gend* variable is always negatively and statistically significantly correlated to all the selected alternative variables, thus confirming the validity of the baseline assumption.

Finally, I run the following additional analyses to confirm the robustness of results: (1) I redo the baseline regression after removing the COVID-19 period (2020 and 2021), and (2) I stress the validity of the baseline

assumptions removing the UK sample, since it represents the biggest share of observations. Holding to this battery of further checks and additional tests, my finding support the existence of an average and marginally negative correlation between language gender-marking and bank boardrooms diversity practices, a finding that will be of particular interest to policymakers and institutions.

6 | CONCLUSIONS

I explore how language gender-marking affect banks' board diversity engagement. Focusing on a sample of EU banks during the 2007–2021 period, I find that language gender-marking should be considered a pivotal cultural factor in understanding different levels of gender diversity in the banking industry.

I also find that language gender-marking should be considered as a relevant variable in explaining the success or failure of board reforms in EU countries, with the results confirming the existence of a causal link between the adoption of more gender-diverse boards and the implementation of reforms for banks headquartered in countries with lower language gender-marking (i.e., less gendered languages). Board gender diversity increased from 23% to 41% after the enhancement of legislative or corporate governance measures for banks headquartered in countries with the lowest level of language gender-marking. In addition, I find that countries' rule of law and government effectiveness channel the language gender-marking–board diversity relationship. However, I do not find any statistically significant differential effect of having more gender inclusive boards on banks' riskiness across countries with different levels of language gender-marking.

Based on value–belief theory, my results offer useful suggestions for policymakers and regulators. First, it is vitally important that languages are considered as a determining cultural aspect in explaining gender diversity in the financial industry. Specifically, I provide data-driven evidence that regulatory authorities should pay more attention to countries' cultural language gender orientation and implement more stringent and targeted corporate governance reforms considering such gender-marking heterogeneity to address the gender diversity gap in Europe. Moreover, by showing how rule of law and government effectiveness channel the language gender-marking–boardroom diversity relationship, my results indicate that EU regulatory authorities may focus on these aspects to fill the documented diversity gap in EU banks. Since gendered language is a monolithic cultural aspect that is often unchangeable, rule of law and government effectiveness are efficient channels through which to reduce gender diversity heterogeneity. EU regulatory authorities may wish to focus on these channels, especially considering the recent passage of the "Women on Boards" Directive.

The findings of this study are confirmed in a difference-in-different econometric framework constructed around the passage of relevant EU board diversity reforms, helping to explain the differing effectiveness of such policies. Therefore, the findings emphasize the importance of considering this cultural variable, namely language gender-marking, during the process of reform design. Furthermore, my findings do not reveal a statistically relevant impact of board gender diversity on risk-taking behaviour, excluding any presence of financial risk performance differences across language gender-marking levels.

However, my paper explores how country-level measure of language gender-marking affect bank boardroom diversity. In line with the literature on the topic, such proxy may not fully capture boards' sex gender culture, especially for highly ethnically diverse banks. Therefore, other researchers may replace the country-level measure of language gender-marking with specific bank board members' nationality, thereby advancing knowledge of language and inclusion in financial institutions.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

ENDNOTES

[1] Due to the high correlation between banks' size and other control variables, I follow Chiaramonte et al. (2021) by centring these variables around the sample mean.

[2] Most importantly, while testing the channel effect of such institutional factors, I include the country's legal origins, GDP, Inflation and D_Quota as a control variable (columns 1 and 2 of Table 5), since has been found to be a relevant aspect for diversity and inclusions practices (Liang & Renneboog, 2017).

REFERENCES

Abou-El-Sood, H. (2021). Board gender diversity, power, and bank risk taking. *International Review of Financial Analysis*, *75*(2021), 101733.

Adams, R. B., & Funk, P. (2012). Beyond the glass ceiling: Does gender matter? *Management Science*, *58*, 219–235.

Ahern, K., & Dittmar, A. (2012). The changing of the boards: The impact on firm valuation of mandated female board representation. *Quarterly Journal of Economics*, *128*, 137–197.

Ahmed, A., & Atif, M. (2021). Board gender composition and debt financing. *International Journal of Finance and Economics*, *26*, 3075–3092.

Arnaboldi, F., Casu, B., Kalotychou, E., & Sarkisyan, A. (2020). Board diversity reforms: Do they matter for EU bank performance? *European Financial Management*, *26*, 416–454. https://doi.org/10.1111/eufm.12238

Berman, A., Cano-Kollmann, M., & Mudambi, R. (2022). Innovation and entrepreneurial ecosystems: Fintech in the financial services industry. *Review of Managerial Science*, *16*(1), 45–65.

Berman, A., Mudambi, R., & Shoham, A. (2022). Linguistic structures and innovation: A behavioral approach. *Journal of International Management*, *28*(4), 1–17.

Bertrand, J., Tutu, F. O., & Weill, L. (2022). Language gender-marking and borrower discouragement. *Economics Letters*, *212*, 110298.

Bøhren, Ø., & Staubo, S. (2016). Mandatory gender balance and board independence. *European Financial Management*, *22*, 3–30.

Boroditsky, L. (2009). How does our language shape the way we think. *What's Next*, 116–129.

Boroditsky, L., Schmidt, L., & Phillips, W. (2003). *Sex, syntax, and semantics. Language in mind: Advances in the study of language and cognition* (pp. 61–80). MIT Press.

Chen, G., Crossland, C., & Huang, S. (2016). Female board representation and corporate acquisition intensity. *Strategic Management Journal*, *37*(2), 303–313.

Chen, M., & Matousek, R. (2020). Do productive firms get external finance? Evidence from Chinese listed manufacturing firms. *International Review of Financial Analysis*, *67*, 101422.

Chiaramonte, L., Dreassi, A., Girardone, C., & Piserà, S. (2021). Do ESG strategies enhance bank stability during financial turmoil? Evidence from Europe. *The European Journal of Finance*, *28*, 1173–1211.

Colladon, A. F., Toschi, L., Ughetto, E., & Greco, F. (2023). The language and social behavior of innovators. *Journal of Business Research*, *154*, 1–13.

Corbett, G. G. (2013). Systems of gender assignment. In: M. S. Dryer, & M. Haspelmath, (Eds.), *The World Atlas of Language Structures Online*. Max Planck Institute for Evolutionary Anthropology, Leipzig, Available online at: http://wals.info/chapter/32. (Accessed 7 September 2021).

Cuomo, F., Gaia, S., Girardone, C., & Piserà, S. (2022). The effects of the EU non-financial reporting directive on corporate social responsibility. *The European Journal of Finance*, 1–27.

Dar, S. S., & Sahu, S. (2022). The effect of language on financial inclusion. *Economic Modelling*, Elsevier, *106*(C), 1–14.

Darwin, C. (1859). *On the origin of species by means of natural selection*. John Murray.

Deaves, R., Lüders, E., & Luo, G. Y. (2009). An experimental test of the impact of overconfidence and gender on trading activity. *Review of Finance*, *13*, 555–575.

Directive 2014/95/EU of the European Parliament and of the Council. 2014. (See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095andfrom=EN)

Dryer, M. S., & Haspelmath, M. (2013). *The world atlas of language structures online*. Max Planck Institute for Evolutionary Anthropology.

European Commission. (2010). Corporate governance in financial institutions and remuneration policies.

European Commission. (2012a). Proposal for a Directive of the European Parliament and of the Council on improving the gender balance among non-executive directors of companies listed on stock exchanges and related measures COM/2012/0614, final – 2012/0299 (COD).

European Commission. (2012b). Women in economic decision-making in the EU: Progress report. *European Commission*, 1–28. https://op.europa.eu/en/publication-detail/-/publication/8832ea16-e2e6-4095-b1eb-cc72a22e28df

European Parliament. 2022. https://www.europarl.europa.eu/news/en/press-room/20220603IPR32195/women-on-boards-deal-to-boost-gender-balance-in-companies.

Falck, O., Heblich, S., Lameli, A., & Suedekum, J. (2012). Dialects, cultural identity, and economic exchange. *Journal of Urban Economics*, *72*, 225–239.

Fauver, L., Hung, M., Taboada, A. G., & Wang, E. J. (2022). Boardroom gender diversity reforms and institutional monitoring: Global evidence. *Review of Accounting Studies*, 1–44.

Freytag, A., & Thurik, R. (2007). Entrepreneurship and its determinants in a cross-country setting. *Journal of Evolutionary Economics*, *17*(2), 117–131.

Golesorkhi, S., Mersland, R., Piekkari, R., Pishchulov, G., & Randoy, T. (2019). The effect of language use in the financial performance of microfinance banks: Evidence from cross-border activities in 74 countries. *Journal of World Business*, *54*, 3.

Gulamhussen, M. A., & Santa, S. F. (2015). Female directors in bank boardrooms and their influence on performance and risk-taking. *Global Finance Journal*, *28*(2015), 10–23.

Heckman, J. J. (1978). Dummy endogenous variables in a simultaneous equation system. *Econometrics*, *46*(6), 931–959.

Hogg, M. A. (2016). Social identity theory. In S. McKeown, R. Haji, & N. Ferguson (Eds.), *Understanding peace and conflict through social identity theory. Peace Psychology Book Series*. Springer. https://doi.org/10.1007/978-3-319-29869-6_1

Hoijer, H. (Ed.). (1954). *Language in culture: Conference on the interrelations of language and other aspects of culture*. University of Chicago Press.

Htun, M., & Weldon, L. (2011). *Sex equality in family law: Historical legacies, feminist activism, and religious power in 70 countries (Background paper for World Development Report 2012)*. The World Bank.

Johansson, S. (2005). *Origins of language: Constraints on hypotheses*. John Benjamins.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). The Worldwide Governance Indicators: Methodology and Analytical Issues. World Bank Policy Research Working Paper No. 5430. Available at SSRN: https://ssrn.com/abstract=1682130

Keltner, D., Gruenfeld, D., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review*, *110*, 265–284.

Kinateder, H., Choudhury, T., Zaman, R., Scagnelli, S. D., & Sohel, N. (2021). Does boardroom gender diversity decrease

credit risk in the financial sector? Worldwide evidence. *Journal of International Financial Markets Institutions and Money*, *73*, 101347.

Kwon, K. Y., Molyneux, P., Pancotto, L., & Reghezza, A. (2023). Banks and FinTech Acquisitions. *Journal of Financial Services Research*, 1–35.

Li, K., & Prabhala, N. R. (2007). Self-selection models in corporate finance. In B. E. Eckbo (Ed.), *Handbook of corporate finance: Empirical corporate finance* (Vol. 1, pp. 37–86). Elsevier/North-Holland.

Liang, H., & Renneboog, L. (2017). On the foundations of corporate social responsibility. *The Journal of Finance*, *LXXII*(2), 853–910.

Mateos de Cabo, R., Gimeno, R., & Nieto, M. J. (2012). Gender diversity on European Banks' boards of directors. *Journal of Business Ethics*, *109*, 145–162. https://doi.org/10.1007/s10551-011-1112-6

Mavisakalyan, A. (2015). Gender in Language and Gender in Employment. *Oxford Development Studies*, *43*(4), 403–424.

McGuinness, P. B., Vieito, J. P., & Wang, M. (2017). The role of board gender and foreign ownership in the CSR performance of Chinese listed firms. *Journal of Corporate Finance*, *42*, 75–99.

Mohsni, S., Otchere, I., & Sharhiar, S. (2021). Board gender diversity, firm performance and risk-taking indeveloping countries: The moderating effect of culture. *Journal of International Financial Markets, Institutions and Money*, *73*, 1–20.

Mueller, S. L., & Thomas, A. S. (2001). Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness. *Journal of Business Venturing*, *16*(1), 51–75.

Oliveira, M., & Zhang, S. (2022). The trends and determinants of board gender and age diversities. *Finance Research Letters*, *46* Part A102798, 1–9.

Olsen, R., & Cox, C. (2001). The influence of gender on the perception and response to investment risk: The case of professional investors. *The Journal of Psychology and Financial Markets*, *2*(1), 29–36.

Osei-Tutu, F., & Weill, L. (2021). Sex, language, and financial inclusion. *Economics of Transition and Institutional Change*, *29*(3), 369–403.

Piketty, T. (2014). *Capital in the twenty-first century*. Belknap Press.

Sampson, G., Gill, D., & Trudgill, P. (2009). *Language complexity as an evolving variable*. Oxford University Press.

Santacreu-Vasut, E., Shenkar, O., & Shoham, A. (2014). Linguistic gender marking and its international business ramifications. *Journal of International Business Studies*, *45*(9), 1170–1178.

Santacreu-Vasut, E., Shoham, A., & Gay, V. (2013). Do female/male distinctions in language matter? Evidence from gender political quotas. *Applied Economics Letters*, *20*(5), 495–498.

Shoham, A., & Lee, S. M. (2018). The causal impact of grammatical gender marking on gender wage inequality and country income inequality. *Business and Society*, *57*(6), 1216–1251.

Shoham, B., Lee, S. M., Rivera, M. J., & Shoham, A. (2020). Impact of the female board members and gaps in linguistic gender marking on cross-border M&A. *Journal of World Business*, *55*(2), 1–18.

Sila, V., Gonzalez, A., & Hagendorff, J. (2016). Women on board: Does boardroom gender diversity affect firm risk? *Journal of Corporate Finance*, *36*, 26–53.

Slobin, D. (1991). Learning to think for speaking native language, cognition and rhetorical style. *Pragmatics*, *1*(1), 7–25.

Stahlberg, D., Braun, F., Irmen, L., & Sczesny, S. (2007). Representation of the sexes in lan- guage. *Social Communication*, 163–187.

Tajfel, H., & Turner, J. C. (1979). Turner an integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Brooks/Cole.

Triandis, H. C. (1995). *Individualism and collectivism*. Westview.

Trinh, V. Q., Cao, N. D., Dinh, L. H., & Nguyen, H. N. (2021). Boardroom gender diversity and dividend payout strategies: Effects of mergers deals. *International Journal of Finance Economics*, *26*, 6014–6035.

Wichmann, S., & Holman, E. W. (2009). *Assessing temporal stability for linguistic typological features*. LINCOM Europa.

Wright, E. O., Baxter, J., & Birkelund, G. E. (1995). The gender gap in workplace authority: A cross-national study. *American Sociological Review*, *60*(3), 407–435.

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APPENDIX A

TABLE A.1 Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12
1	Board gender diversity	1											
2	Lang_gend	−0.0188	1										
3	Size	0.1356	−0.0980	1									
4	Roe	0.0515	0.0004	−0.0240	1								
5	Gl_ta	−0.0569	0.0774	−0.2016	−0.0570	1							
6	Dep_ta	−0.0397	0.0171	−0.2102	0.1419	−0.3813	1						
7	Cir	−0.0192	−0.0955	0.0568	−0.5243	−0.1411	0.0591	1					
8	Int_ass	−0.2943	0.0834	−0.0191	0.1279	−0.1362	0.0786	−0.0222	1				
9	Ownesthip	−0.1312	0.0045	0.1115	−0.0315	−0.1092	0.1568	0.0682	0.1094	1			
10	Gdp_grw	−0.0149	−0.0477	0.0095	0.1782	0.0434	0.1106	0.0011	−0.0131	0.0156	1		
11	Infl_pc	−0.1605	−0.0502	0.0368	0.1822	−0.0840	0.0269	−0.1248	0.1653	−0.0204	0.1257	1	
12	D_Quota	0.4150	0.1329	−0.1248	−0.0693	−0.0113	0.1762	0.0903	−0.1104	−0.0697	0.1110	−0.3736	1

TABLE A.2 Variable definition and source.

Variable	Definition	Source
Board gender diversity	The % of women on board	Thomson Reuters Refinitv'
Lang_gend	A variable equal to 0 for countries with the lower gendered language; 1 for middle gendered language; 2 for higher gendered language	WALS database (Dryer & Haspelmath, 2013)
Size	Natural Logarithm of bank's total asset.	Thomson Reuters Refinitv', Author's own calculation
Roe	Return on equity	
Gl_ta	Gross loans divided by total assets	
Dep_ta	The amount of deposit divided by total assets	
Cir	Cost to income ratio	
Int_ass	Intangible assets scaled by total assets	
Ownership	A variable proxying the banks' ownership; 1 if Government-owned; 2 if limited liability; 3 if mutual; 4 if stock-based corporation.	
Gdp_grw	The gross domestic product growth ratio	World Bank Database
Infl_pc	The inflation percentage	
D_Quota	A variable equal to 1 for banks headquartered in countries adopting a gender quota in 2014 and 0 if not adopting.	Arnaboldi et al., 2020