

Breaking the glass ceiling: The Impact of Cultural Values on Women in Board Leadership Roles

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Abstract:

Employing a global sample of firms, we examine whether societal beliefs about gender equality shape women's access to board leadership positions. We measure gender-equality cultural beliefs using the World Values Survey (WVS) and find a significant and positive relationship between these beliefs and the overall likelihood of women holding board leadership roles, such as board chair or chair key board committees. The effect is particularly pronounced when female directors have weaker observable qualifications, where appointment decisions are more discretionary and traditional signals are less decisive. We further show that women's participation in board leadership positions, influenced by cultural beliefs in gender equality, significantly improves the firm's financial performance. Overall, the evidence suggests that gender-equality culture lowers informal barriers to female leadership and weakens the boardroom glass ceiling.

Keywords: National Culture, Women in Leadership, Board Leadership, Corporate Governance.

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1. Introduction

Heightened pressure from investors and regulators has placed board gender diversity on the corporate agenda, and firms have responded by increasing the share of female directors over recent decades (Gormley et al., 2023).¹ Yet, it is arguable increases in female representation need not translate into women holding positions of power and may, in some settings, be largely symbolic (Adams & Ferreira, 2009; Farrell & Hersch, 2005). Consistent with this concern, Field et al. (2020) find that female directors are less likely to occupy board leadership positions, even though they often exhibit stronger qualifications than their peers, pointing to a persistent glass ceiling within the boardroom hierarchy. This leadership gap can result from discrimination and implicit bias, as well as unequal access to the networks, sponsorship, and mentoring that shape appointments to chair and committee leadership roles (Cotter et al., 2001; Eagly et al., 2007). In this paper, we investigate whether culturally embedded beliefs and attitudes about gender equality help explain variation in women's likelihood of attaining board leadership positions and, more broadly, their ability to break through the boardroom glass ceiling.

Previous literature examined various determinants of women's promotion to leadership positions, primarily emphasizing individual education and childbearing status (Davies-Nettley, 1998; Hurley & Choudhary, 2016; Pini, 2005), gender diversity in boards (Cook & Glass, 2014; Field et al., 2020; Ng & Sears, 2017; You, 2021), and gender quota regulatory interventions (Hamplová et al., 2022; Maida & Weber, 2022; Wang & Kelan, 2013). Far less attention has been paid to culturally embedded beliefs about gender equality, which may shape whether

¹ Countries, such as Norway, France, and Italy, have implemented formal legislation requiring a minimum level of female directors on corporate boards, while others, including the UK and Sweden, are in the process of introducing similar regulations (Latura & Weeks, 2023; Terjesen et al., 2015).

decision makers view women as legitimate holders of authority and whether stakeholders accept women in high-visibility leadership roles. Unlike individual- or firm-level determinants, culture is slow moving and operates as a shared constraint on selection and promotion, influencing both the supply of potential female leaders and the demand for women in positions of power (Cronk, 2017; Kistler et al., 2015; Matsumoto, 2007; Sagiv & Schwartz, 2022). By focusing on gender-related cultural attitudes, we capture the prevailing norms and expectations that can influence leadership appointments even under similar formal incentives to increase female representation.

To estimate the relationship between gender-related cultural beliefs and women's appointments to board leadership positions, we analyze data from a sample of 823,999 director-firm-year observations across 56 countries from 2005 to 2022, representing 133,364 individual directors serving at 17,390 unique firms. Following existing literature (Burns et al., 2025; McLean et al., 2023), we employ societal attitudes regarding women's rights and roles in education and employment sectors from the World Values Survey (WVS) to construct gender-related cultural beliefs. We hypothesize that gender equality beliefs can promote female directors' advancement to board leadership roles. Specifically, in an environment with strong gender equality beliefs, firms should prioritize individual competence and skills over traditional gender traits in the recruitment and promotion process. It mitigates gender bias perceptions arising from traditional gender roles, such as insufficient career commitment among women, masculine leadership stereotypes, and the incongruity between traditional gender traits and leadership qualities. The barriers to women's advancement are thereby dissolved, resulting in a more inclusive and egalitarian employment environment.

The empirical results show a substantial leadership gap in the boardroom: compared to their male counterparties, females are less likely to be appointed to a leadership role. However, such gap will be narrowed once we include the culture values. Specifically, in countries with

strongest beliefs in gender equality, women are 3.7 percentage points less likely than comparable men to hold a board leadership role. In contrast, in countries where gender equality beliefs lie at the bottom of the distribution, the gap widens to 11.7 percentage points. In other words, moving from the bottom to the top of the gender equality distribution reduces the female leadership disadvantage by roughly 8.0 percentage points, which is about 20% of the sample mean leadership rate (0.394). This magnitude indicates that gender equality culture substantially attenuates the boardroom glass ceiling. We further show that gender equality beliefs primarily narrow the leadership gap in substantive positions, such as board chair and the chairs of major committees, rather than in more symbolic roles, such as lead director. We also find the two specific dimensions of gender-equality beliefs, support for women's education and labor participation, both play a significant role in promoting women's representation in board leadership positions.

To assess the validity and robustness of our findings, we address potential endogeneity concerns and conduct several robustness tests. In our analysis, reverse causality is unlikely to confound the main finding, as cultural measures capture the enduring attitudes of a country's average inhabitant, which are less likely to be influenced by individual- or firm-level behavior in the short term (Aggarwal et al., 2016). Omitted variables may bias our results, as unobservable factors could simultaneously affect cultural beliefs and gender-related outcomes. To eliminate this omitted variable bias, we employ a Two-Stage Least Squares (2SLS) instrumental variable analysis, using historical determinants of national cultures as instrumental variables to predict cultural belief.² The results are consistent with our main findings, suggesting that the findings are not confounded by endogeneity issues. Moreover, we conduct several robustness checks to assess the reliability of our findings across different settings, including alternative measures of gender equality beliefs, the exclusion of U.S. firms

² It includes language separation time, the distribution of major religious affiliations, and historical national wealth.

from the sample, firm-level fixed effect models, and Probit model estimation. Across all these tests, the results consistently show that gender-equality beliefs increase the relative likelihood of women being appointed to board leadership positions more than men, strengthening the robustness of our findings.

Our cross-sectional analyses further reveal that the effect of gender-equality cultural beliefs is not uniform across female directors. Specifically, the positive association between gender-equality culture and women's appointment to board leadership positions is significantly stronger when female directors have weaker observable qualifications such as those with lower educational qualification and the absence of commonly valued background experiences (e.g. executive experience). The stronger cultural effect in this subsample suggests that gender-equality culture primarily operates by reducing informal barriers to female leadership and legitimizing women's advancement in borderline cases, rather than by simply rewarding already highly credentialed female directors.

Beyond individual-level heterogeneity, we find that gender-equality cultural beliefs play a significantly larger role in promoting women's appointments to board leadership positions when boards are less internationalized and when countries face higher economic policy uncertainty. In firms with a lower proportion of foreign directors, board decision-making is more locally embedded, increasing the salience of domestic gender norms in leadership selection. Similarly, under high policy uncertainty, firms are more likely to draw on widely accepted cultural beliefs to guide and legitimize strategic decisions, including leadership appointments. Together, these results show that the influence of gender-equality culture is not uniform but becomes stronger precisely when boards and firms rely more heavily on local norms, highlighting culture as a conditional and economically meaningful determinant of women's access to board leadership roles.

A large body of research shows that female board representation is, on average, associated with stronger firm performance.³ In a final analysis, we focus more narrowly on women in board leadership roles, where they are more likely to set agendas and influence key decisions (Bezemer et al., 2018; Krause et al., 2019; Withers & Fitza, 2017). Accordingly, the value of women's diverse perspectives and skills should be more pronounced in these positions and, in turn, more likely to reflect in firm performance. To explore the economic relevance of women holding board leadership positions, we construct a firm-level panel and examine the association between female board leadership and financial performance. We find that, on average, firms with females in leadership roles exhibit stronger financial performance, and that this impact is stronger in countries with more gender equality beliefs. This pattern is consistent with gender equality culture increasing the effectiveness of female leaders by strengthening perceived legitimacy and reducing barriers to exercising authority, thereby allowing leadership roles to translate more readily into governance actions and firm outcomes.

Our research contributes to literature in multifold. First, we contribute to the literature on the determinants of women's representation in leadership position. Previous research has identified various determinants, such as individual qualifications, institutional environments, industry characteristics, and gender quota policies (Cook & Glass, 2014; Davies-Netzley, 1998; Hamplová et al., 2022; Hurley & Choudhary, 2016; Maida & Weber, 2022; Pini, 2005; Settles et al., 2007; Wang & Kelan, 2013). Few studies have examined the influence of cultural beliefs, and those that exist primarily focus on individual-level beliefs (McLean et al., 2023). Unlike individual- or firm-level determinants, culture is slow moving and operates as a shared

³ Besides, a growing body of research emphasizes the importance of female representation on boards, suggesting women's unique skills, knowledge, and experiences can enhance corporate governance and firm performance (Adams & Ferreira, 2009; Brown et al., 2002; Fernandez et al., 2019; Fondas, 2000; Kaspereit et al., 2016; Liu et al., 2014; Post & Byron, 2015; Sheridan & Milgate, 2005; Singh et al., 2001; Srinidhi et al., 2020; Wiersema & Mors, 2023).

constraint on selection and promotion, influencing both the supply of potential female leaders and the demand for women in positions of power. By focusing on gender-related cultural attitudes, we identify a country-level force that helps explain variation in women's access to board leadership beyond individual qualifications and formal governance reforms.

Second, our study contributes to the literature on how culture beliefs shape women's labor market outcomes. Existing studies largely examine compensation-based outcomes, such as the gender pay gap and related earnings differences (Burns et al., 2025; Chen et al., 2022; Ñopo et al., 2012).⁴ We extend this line of research by focusing on a distinct and economically important margin: women's attainment of leadership roles where decision-making power is concentrated. This shift from pay to authority clarifies how culture relates not only to earnings differences, but also to inequality in access to influential positions.

Last, our findings also have implications for policy design. To encourage women's labor market participation and reduce workplace gender gaps, many countries, including Norway, Iceland, Italy, Belgium, France, have adopted mandatory gender quota legislation for corporate board.⁵ Recent evidence, however, suggests that such mandates can generate unintended consequences, particularly when formal requirements conflict with prevailing social norms and expectations (Bertrand et al., 2019; Bian et al., 2024). In these settings, quotas may raise the number of female directors without a commensurate shift in authority, effectively encouraging window dressing rather than substantive inclusion. Our results indicate that cultural beliefs are a key moderator of whether representation translates into leadership. Accordingly, quota-based

⁴ For example, Chen et al. (2022) employed Schwartz's national-level egalitarianism index and found that attitudes toward gender equality across countries are the significant factor explaining the CEO gender pay gap. Burns et al. (2025) constructed a gender equality index from the World Values Survey and found that culturally embedded beliefs significantly explain differences in executive compensation.

⁵ For example, Norway enacted legislation in 2004 mandating that at least 40% of corporate board members be women, and explicitly stated that companies failing to meet these requirements could face penalties including warnings, substantial fines, or even dissolution (Latura & Weeks, 2023; Terjesen et al., 2015).

policies are likely to be most effective when paired with complementary measures that reduce normative resistance and strengthen the acceptance of women in positions of authority.

The remainder of the paper is organized as follows. Section 2 reviews the relevant literature and develops the hypotheses. Section 3 describes the sample selection and variable construction. Section 4 describes the empirical methodology and presents the main regression results. Section 5 conducts cross-sectional analyses. Section 6 addresses endogeneity concerns and presents robustness checks. Section 7 conducts additional analysis. Section 8 concludes.

2. Literature Review and Hypothesis Development

2.1 Women in Board Leadership Roles

Many studies examine the influence of women in leadership roles on corporate performance outcomes (Dezső & Ross, 2012; Flabbi et al., 2019; Francoeur et al., 2008; Glass et al., 2016; Moreno-Gómez & Calleja-Blanco, 2018; Strøm et al., 2014). For example, Dezső and Ross (2012) propose that female representation in top management teams improves firm performance, as female leaders enrich management behaviors and bring informational and social diversity benefits. Francoeur et al. (2008) argue that firms with a higher proportion of female executives in senior management are more likely to generate positive abnormal returns in complex environments, because women frequently bring new perspectives to complex issues and help to correct information biases in strategic planning and problem-solving processes. Glass et al. (2016) suggest that firms led by female CEOs are more effective in implementing environmentally sustainable strategies due to women's inherent empathy and concern for others and greater awareness of the consequences of environmental harm on personal well-being. Besides, Strøm et al. (2014) suggest that a female CEO and a female board chair are positively associated with financial performance in companies with a predominantly female customer, as female leadership teams have a deeper understanding of the market dynamics relevant to

female consumers. Similarly, Flabbi et al. (2019) suggest that the impact of female leadership on firm performance increases with the proportion of female employees, as female executives are better at interpreting productivity signals from female employees, implying that the underrepresentation of women in executive roles may result in substantial costs to firms.

While research consistently shows that women in leadership roles can improve a firm's performance, women remain underrepresented in boards leadership positions. Specifically, women only hold 8.4% of board chair positions globally, which is nearly three times lower than the percentage of women serving on boards overall (Bowman et al., 2024; International Finance Corporation, 2024; MSCI, 2024). The proportion of women serving as lead directors is better than that of chairs, with 46% in the UK's FTSE 350 (SpencerStuart, 2024), 35% in European companies (Bouwens & Sanderson, 2024), and 22% in the US S&P 500 in 2024 (News Desk, 2024). For committee chairs, women generally hold less than 30% of committee chair positions worldwide, with 26.3% of nomination committee chair positions, 29.9% of compensation committee chair positions, and 29.3% of audit committee chair positions among the constituents of the MSCI ACWI index (MSCI, 2024). This percentage varies significantly by region, with women occupying 41% of committee chairs in leading European companies but merely 27% in the United States (Deloitte, 2024).

2.2 National Culture and Gender Bias in the Workplace

Traditional cultural beliefs often define the individual's appropriate or desirable characteristics based on their gender within the prevailing social context. For example, men are generally expected to have individualistic values and agentic-instrumental traits, including assertiveness and dominance; in contrast, women are typically associated with collectivist values and expressive-communal traits, including compassion and caring for others (García-Ael et al., 2012; Rincón Diez et al., 2017). These gender-specific characteristics are consistent across

different countries (Williams & Best, 1990).⁶ These expected traits shape the distribution of society responsibility between men and women, with women being primarily expected to take on family caregiving duties while males are expected to participate more in the labor market. It influences societal attitude about gender roles and individual behavior, enabling individuals to conform to social expectations. For example, Sánchez-Sellero and Sánchez-Sellero (2013) found that an increase in family size reduces the probability of women being employed by others, while the probability of men being employed remains unchanged. Kaufman and Uhlenberg (2000) suggest that women with children are less likely to participate in the labor market than women without children, while men with children are more likely to participate and work longer hours than men without children.

The persistence of traditional gender roles reinforces gender stereotypes, which describe and prescribe that certain qualities are more closely linked with one gender than the other. These stereotypical traits are usually used to evaluate individuals and make relevant decisions, such as prioritizing task performance when assessing men while emphasizing social interaction skills when evaluating women (Ellemers, 2018). However, this evaluation approach ignores variations in attributes within one gender and fails to recognize individual true traits, resulting in biased evaluations and discriminatory behavior in the labor market. For example, Joshi et al. (2015) demonstrate that significant gender pay disparities have endured across various work settings over the past three decades due to gender stereotype bias. Jarman et al. (2012) and Buffington et al. (2016) found that gender stereotype bias causes clear gender segregation in occupational roles across 30 industrialized countries: some professions (such as policing,

⁶ Williams and Best (1990) conducted a study investigating gender roles across 25 countries and found that when participants were asked to identify whether each adjective in a list was more frequently associated with men, women, or neither group, their responses were strongly consistent across countries with these gender traits.

science, and engineering) are male-dominated, while others (such as nursing) are female-dominated.

Cultural beliefs, as a source of gender stereotype bias, played a significant role in the degree of gender equality within firms, with the positive cultural attitudes toward gender equality improving organizational perception of gender equality and alleviating related discriminatory concerns (Burns et al., 2025; May & McGarvey, 2017; Racko & Burchell, 2013; Uunk, 2015). For example, May and McGarvey (2017) propose that cultural values across various regions affect women's representation in higher education and male-dominated STEM fields, indicating that states supporting liberal beliefs have greater gender integration in the labor market and reduced occupational segregation than those that follow conservative values. Racko and Burchell (2013) demonstrate that religious cultural attitudes played an important role in explaining gender occupational segregation across different countries, with this segregation being more pronounced in countries where religious beliefs emphasize more rigid gender role distinctions, such as Catholicism or Protestantism. In addition, Burns et al. (2025) contend that cultural differences embedded in societies have significant explanatory power for the observed gender gap in executive compensation, with gender equality cultural attitudes strongly associated with a lower gender pay gap.

2.3 Women in Board Leadership Roles and National culture.

As indicated in Section 2.1, women remain significantly underrepresented in board leadership positions (Cotter et al., 2001; Eagly et al., 2007), supporting the glass ceiling theory that women usually face more invisible barriers to promotion into leadership positions. There are four specific gender biases embedded in traditional cultural beliefs that explain women's underrepresentation in leadership positions. Firstly, based on societal expectations that women primarily assume family caregiving duties, employers usually regard women as less committed

to their careers and offer them less relevant leadership training and fewer opportunities for management positions (Rincón Díez et al., 2017). Secondly, based on traditional gender roles, leadership traits in the workplace are generally considered to be associated with stereotypically masculine characteristics, such as assertiveness, task initiation, problem-focused strategies, and innovation. Women who exhibit fewer masculine traits may be regarded as lacking leadership ability (Johns, 2013). Thirdly, the role congruity hypothesis suggests that leaders are expected to demonstrate particular leadership qualities while conforming to traditional gender role expectations (Eagly & Karau, 2002). When evaluating women in leadership roles, dual expectations cause conflict as women cannot simultaneously exhibit male stereotype-based leadership traits and traditional feminine traits, resulting in negative perceptions of women's leadership skills (Eagly & Karau, 2002; Kubu, 2018).

Fourthly, the underrepresentation of women in leadership positions exacerbates implicit gender biases, resulting in a self-reinforcing negative feedback loop. Specifically, the low number of female leaders leads to a lack of female role models, limiting the opportunities for aspiring women leaders to learn effective leadership behaviors (Ibarra et al., 2013). It may also unintentionally convey that women are unsuitable for leadership roles, discouraging young women from pursuing leadership positions (Ibarra et al., 2013; Kubu, 2018). Also, since individuals tend to associate with and promote those who resemble themselves,⁷ the underrepresentation of women in leadership positions makes it difficult for women to access powerful professional networks and build social connections with the elite, exacerbating barriers to women's advancement into leadership positions (Cerami et al., 2010; Kubu, 2018; McGuire, 2002).

⁷ For example, the "old boy network" at the top management team, as an informal male social system that deliberately excludes women, facilitates the sharing of resources and insider information (Oakley, 2000).

Given that traditional culture beliefs are a primary source of these gender biases hindering women's promotion, we hypothesize that cultural beliefs supporting gender equality are more likely to alleviate these biases and promote the women's appointment to leadership positions. Specifically, in countries with higher gender equality beliefs, individuals are more likely to be evaluated based on their skills and competence rather than traditional gender roles in leadership appointment decisions. This disregard for traditional gender roles alleviates the stereotype that leadership attributes are inherently associated with traditional masculine traits and diminishes the role congruity expectations that require women leaders to not only exhibit stereotypically masculine leadership qualities but also adhere to traditional gender norms. These reductions in gender bias eliminate some barriers women typically face in career promotions, increasing their opportunities to attain leadership roles. Besides, the increased representation of female leaders further mitigates implicit biases stemming from the scarcity of female role models in leadership positions, as it sends a clear message that being a woman is compatible with leadership, encouraging more women to pursue leadership positions. This creates a positive feedback loop of women's appointment to board leadership positions: increased female representation in leadership roles reduces perceptions of gender-based bias, improves the recognition of female leaders, and further promotes more women to attain leadership positions. Based on these reasons, we propose the following hypothesis:

H1: In countries with stronger gender equality beliefs, women are more likely to hold board leadership positions.

3. Sample Selection and Variables Construction

3.1 Measuring Beliefs About Gender-Equality Index

Gender equality beliefs across countries are measured using the World Values Survey (WVS), which is a cross-national project conducted by the University of Michigan's Institute for Social Research. The project is conducted in person by a global network of social scientists at periodic intervals, i.e., in waves, and examines individuals' fundamental beliefs and values and their influence on social life. Across multiple survey waves, we use WVS waves 5 (2005 - 2009), waves 6 (2010-2014), and waves 7 (2017-2022) to ensure the closest alignment between WVS wave responses and the corresponding years of board and financial data.

Following Burns et al. (2025), we focus on five WVS questions related to the individual's perception of women's roles and rights in society. These questions address the importance of women's education, women's right to work, and the impact of women's employment on their families.⁸ We adjust and invert some responses of these gender-related questions based on the question content to achieve the same polarity, ensuring that the higher values indicate a more egalitarian role for women in society. This approach enhances the clarity of interpretation and reduces potential measurement errors in the survey data (Welzel, 2013; Welzel & Inglehart, 2005). Next, we standardize each WVS item on a scale with 0/1 minimum and maximum to address the issue that the WVS responses are measured on various scales. Finally, we calculate the average scores of five question responses for each country and financial year to develop a gender-equality index.

Table 2 presents summary statistics for gender equality scores, showing that both the mean and median scores are approximately 0.7. Table 1 further displays a detailed analysis of the Gender

⁸ Appendix B provides detailed descriptions of the variables.

Equality Index categorized by country. The countries with the highest gender equality scores are France (0.83) and Norway (0.83), followed by Finland (0.81), the Netherlands (0.79), and Sweden (0.79). In contrast, the countries with the lowest gender equality scores are Pakistan (0.40), Egypt (0.40), Bangladesh (0.40), and Jordan (0.40), with India slightly higher at 0.41.

3.2 Gender and Leadership Roles

Following Field et al. (2020), leadership positions include board chair, lead director, and chair of major committees such as audit, governance, remuneration, or nominations. Specifically, the board chair and committee chair, as the primary leaders of the board and committee, hold significant formal responsibilities, including planning and leading meetings, representing the organization in engagements with key stakeholders, and ensuring the firm meets its legal obligations and corporate governance standards (Bezemer et al., 2018; Krause et al., 2019; Withers & Fitza, 2017). Besides, Lead Director, as a position introduced in recent decades, is typically appointed when the roles of CEO and Board Chair are held by the same individual to prevent excessive concentration of power in the CEO and strengthen the board's independence (Li, 2025; Penbera, 2009). Their primary duty is to serve as a liaison between the independent directors and the CEO by presiding over meetings of independent directors and conveying their views to the CEO (Li, 2025; Penbera, 2009). We identify female directors and collect data of board leadership positions from BoardEx.

Figure 1 presents the proportion of women on boards and board leadership positions over time. Panel A displays the percentage of female directors relative to all board directors (blue line) and the percentage of women in board leadership roles relative to all board leadership positions (red line). While the proportion of female directors and leaders on boards has increased during the sample period, women still accounted for only about 19% of all board leadership positions as of 2022. Descriptive statistics in Panel A of Table 2 further show that, on average, women

hold just 4% of board chair positions, 8% of lead director roles, and 14% of committee chair roles, reflecting women's significant underrepresentation in board leadership positions.

3.3 Country and Firm Characteristics and Sample

Following Bilimoria and Piderit (1994); Fedaseyeu et al. (2018); Hurley and Choudhary (2016); Kesner (1988), we identify key biographical characteristics of directors that influence the appointment of leadership positions, including tenure, educational background, and professional experience across various areas. All of this data is sourced from BoardEx. At the country level, we control for several country-level variables, including the female labor force participation rate, GDP, elderly population rate, and the Women, Business and the Law Index score, to account for broader institutional and demographic factors that may affect women's appointment to leadership positions. Data for these variables are obtained from Ortiz-Ospina et al. (2018) and the World Development Indicators (WDI). Besides, we incorporate a range of firm-level and board-level characteristics to control for organizational context, with data collected from BoardEx and Compustat. Definitions for these variables are provided in Appendix A, and summary statistics for the full sample are presented in Table 2.

Our sample consists of 133,364 directors from 17,390 companies across 56 countries, comprising 823,999 director-firm-year observations spanning the period from 2005 to 2022. Countries without female directors or with less than 100 available observations are excluded from the sample. All continuous variables are winsorized at the 1% level for both tails. Table 1 shows the distribution of total sample observation by country. As with most cross-country study samples, the United States had the most representation, with 524,734 director-firm-year observations, accounting for more than 50% of sample. The United Kingdom has the second-highest number of observations (49,790), followed by Canada (40,228), Germany (34,805), India (25,013), and Australia (23,332).

4. Multivariate Analysis

The multivariate regression models are estimated to evaluate the impact of gender and related cultural beliefs on a director's appointment to board leadership positions, controlling for the observable characteristics that might influence these appointment decisions:

$$\begin{aligned} \text{Leadership Roles}_{i,t} = & \beta_0 + \beta_1 \text{Female}_{i,t} + \beta_2 \text{Gender Equality Belief}_{i,t} + \beta_3 \text{Female} * \\ & \text{Gender Equality Belief}_{i,t} + \beta_4 \text{Director Controls}_{i,t} + \beta_5 \text{Board Controls}_{i,t} + \\ & \beta_6 \text{Firm Controls}_{i,t} + \beta_7 \text{Country Controls}_{c,t} + \text{Fixed Effects} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

where t represents the year, i represents the firm, and c represents the country.

Our dependent variable, *Leadership Roles*, is an indicator variable that takes a value of one if the director serves as board chair, lead director, or chairs a major committee (audit, compensation, remuneration, and governance) and zero otherwise. The independent variables include *Female*, a dummy variable equal to one if the director is a woman and zero otherwise, and *Gender equality beliefs*, a country-level index derived from standardized cultural-value scores that capture perceptions of women's roles and rights in society. The interaction term $\text{Female} \times \text{Gender Equality}$ is included as a key explanatory variable to investigate how gender-related cultural attitudes influence the gender gap in board leadership roles.

We control a wide range of director qualifications and experience that may influence their appointments to leadership positions, including director tenure (*Director tenure*), educational background (*Bachelor degree*, *Master degree*, *MBA degree*) and prior experience in the financial sector (*Financial experience*), academia (*Academic experience*), the legal field (*Law experience*), and the political field (*Political experience*). At the board level, key governance characteristics are included, such as board size (*Board size*), the proportion of independent directors (*Board independent ratio*), CEO duality (*CEO duality*), and whether the CEO is female (*Female CEO*). Beyond director and board attributes, we incorporate firm-level

financial indicators, including the capital expenditure-to-sales ratio (*Capital expenditure/Sales*), return on assets (*Return on asset*), debt-to-assets ratio (*Debt/Assets*), research and development expenditure-to-assets ratio (*R&D/Assets*), and the natural logarithms of total assets (*Ln(assets)*) and total sales (*Ln(sales)*). Finally, we control the institutional and demographic factors at the country level, including *GDP*, *Fertility rate*, the proportion of the population aged 60 and above (*Percentage of population over age 60*), the female labor force participation rate (*Female labor participation rate*), and the *Women, Business and the Law* Index score. Besides, we include industry (measured by a two-digit SIC code), year, and country fixed effects to absorb variation from leadership positions and gender representation over time and across industries and countries. Standard errors are clustered by firms to account for potential correlation in the error terms within the same firm.

4.1 Gender-Related Beliefs and Women in Overall Leadership Positions

Table 3 presents the baseline result. Model (1) includes only the *Female* variable as a predictor of leadership appointments, aiming to clearly identify the relationship between gender and leadership roles. The coefficient on *Female* is significantly negative, with a value of 0.105, indicating that female directors are 10.5% less likely to hold leadership positions compared to their male counterparts. Across models (2) to (6), we incorporate *Gender equality* and its interactions with the *Female* indicator and progressively add director-, board-, firm-, and country-level controls.⁹ In these models, the coefficient on *Female* reflects the relationship between female and leadership positions in environments with low endorsement of gender equality beliefs. The result shows that this coefficient remains significantly negative, suggesting the negative association between female directors and the likelihood of board

⁹ These variables are gradually added across models. Model (2) incorporates *Gender Equality* and its interaction with the *Female* indicator; Model (3) adds controls for director qualifications and experience; Model (4) further accounts for board characteristics; Model (5) additionally includes firm-level financial variables; and Model (6) incorporates the country-level characteristics, representing the fully specified model.

leadership appointments in environments with poor gender equality beliefs. Taken together, these results provide strong evidence that women are generally less likely than men to be appointed to leadership positions on boards.

Across models (2) to (6), the coefficient on *Gender Equality* reflects the marginal effect of gender equality beliefs on the likelihood of holding a leadership position when the *Female* equals zero. In other words, it captures the effect of gender equality beliefs on the likelihood of men holding board leadership positions. The result reveals a consistently negative coefficient on *Gender Equality* beliefs across these models, with statistical significance observed in models (2) and (3). It suggests that gender equality beliefs have a negative effect on the likelihood of male directors holding board leadership positions. This is likely because gender equality beliefs typically prioritize promoting the advancement of women who are underrepresented in leadership positions, while placing less focus on men, potentially limiting their appointment opportunities and reducing the likelihood of being appointed to board leadership positions.

The coefficient on the interaction term *Female* $\times$ *Gender Equality* captures the incremental effect of gender equality beliefs on the likelihood that female directors are appointed to board leadership positions. The result shows that the interaction term is positive and statistically significant across all models (2) to (6), indicating that in an environment with stronger gender equality beliefs, female directors are more likely than male directors to be appointed to board leadership positions. Specifically, the interaction coefficient in Model (6) of 0.186 suggests that the marginal effect of gender equality beliefs on the likelihood of attaining board leadership is 18.6% higher for female directors than for their male counterparts. Given that the standard deviation of gender equality beliefs is 0.097, this coefficient also suggests that a one-standard-deviation increase is associated with a 1.80% increase in the relative likelihood of women attaining leadership roles compared to men.

The overall marginal effect of gender equality beliefs on women's appointments into board leadership positions is calculated as the $\beta_2 + \beta_3$,¹⁰ showing positive coefficients in most models. It supports our hypothesis that gender equality beliefs have a positive impact on promoting women's appointment to board leadership positions. In particular, the combined coefficient on *Gender Equality* and *Female* $\times$ *Gender Equality* in model (6) is 0.140, indicating that a one standard deviation increase in gender equality beliefs (0.097) is associated with an approximately 1.36% increase in the likelihood of women's appointments to board leadership roles. Moreover, this positive effect significantly contrasts with the negative relationship between the female directors and board leadership appointment in model (1), implying the important role of gender equality beliefs in mitigating gender biases and promoting women's advancement into leadership positions.

4.2 Gender-Related Beliefs and Women in Specific Leadership Positions

In this section, we study how gender equality beliefs influence women's appointments to certain board leadership positions, aiming to investigate the distinct effects of cultural attitudes on these positions. Following Field et al. (2020), these specific leadership positions include chairman (*Chairman*), lead director (*Lead Director*), and overall committee chair roles of the four major committees (*Committee Chair*): audit, compensation, nomination, and governance.

Table 4 reports the result of the impact of gender equality beliefs on women serving in each leadership role. Model (1) presents the result for the board chair position,¹¹ showing that the coefficient of *Female* $\times$ *Gender Equality* is positive and significant, with a value of 0.041. This indicates that as gender equality beliefs strengthen, female directors become increasingly more likely to be appointed as chairpersons relative to male directors.

¹⁰ The overall marginal effect is measured by the sum of the coefficients on the main (*Gender equality beliefs*) and the interaction term (*Female* $\times$ *Gender Equality*).

¹¹ Appendix A provide a definition of the *Board chair* variable.

Model (2) examined the impact on the overall likelihood of women holding major committee chair positions. The dependent variable, *Committee Chair*, is defined as one if a director holds any of the four major committee chair positions: audit, nominating, governance, or compensation committee, and zero otherwise. The coefficient on the interaction term *Female* $\times$ *Gender Equality* is significantly positive at 0.107, indicating that as gender equality beliefs increase, female directors are 10.7% more likely than male directors to hold chair positions on major committees.¹²

To further examine the impact on the women's appointment on specific committee chairs, we conduct a disaggregated analysis by separating overall committee chairs into specific committee chair roles. Model (3)-(6) reports the results for each of the four major committees separately, showing that the interaction term *Female* $\times$ *Gender Equality* is significantly positive in Models (3) – (5) but insignificantly positive in Model (6) for nominating committees. Among these committees, the audit committee shows the strongest interaction, with a 9% greater improvement for female directors than for male directors as gender-equality beliefs increase, followed by the compensation committee (3.6%), the governance committee (3.3%), and the nomination committee (2.4%). This study indicates that as gender-equality beliefs increase, women exhibit a relatively larger rise in the likelihood of being appointed to most major committee chairs than men, narrowing the gender gap in major committee chair positions.¹³

Model (7) reports on the effect on *Lead Director*.¹⁴ The coefficient for the *Female* $\times$ *Gender Equality* interaction is negative and statistically significant, with a value of 0.035. This indicates that gender equality beliefs have a more negative effect on women's likelihood of

¹² The overall marginal effect shows that a one-unit increase in gender equality beliefs is associated with a 13.4 % (calculated as $\beta_2 + \beta_3$) increase in the likelihood that women are appointed as the chair of any major committee.

¹³ Specifically, according to the overall effect (calculated as $\beta_2 + \beta_3$), gender-equality beliefs only weaken the negative effect for the governance and nomination committees, with the impact on women's appointments remaining negative. For the audit and compensation committees, gender equality beliefs are associated with a positive effect on women's appointments as committee chairs.

¹⁴ Appendix A provide a definition of the *Lead Directors* variable.

being appointed as lead directors, with the marginal effect of gender equality beliefs being 3.5% lower on women's appointments than on men's.¹⁵ The potential explanation is that the appointment of lead directors usually serves as a symbolic management strategy, and gender equality beliefs typically hinder women from assuming such symbolic leadership positions, in order to promote true gender equality within the firm (Krause et al., 2017; Li, 2025). Specifically, the main role of the lead director is to provide independent monitoring of the CEO and avoid excessive concentration of power in the CEO. However, CEOs can exert significant influence over the selection of lead directors and typically favor candidates from their personal networks over objectively qualified individuals (Krause et al., 2017; Lipton & Lorsch, 1992; Shi & Connelly, 2018).¹⁶ The intentional bias in selecting lead directors impairs their functional independence and diminishes their effectiveness in executing oversight roles, resulting in tokenism appointment concerns.

Overall, we categorized board leadership positions and examined whether gender equality beliefs can independently affect the gender gap in these particular positions. These results indicate that gender equality beliefs increase women's representation in influential leadership roles, including board chairs and major committees' chairs (both overall and within specific committees), while adversely affecting appointments to symbolic leadership positions, including lead director.

¹⁵ Combined with the negative coefficient of Gender Equality, this result further suggests that as gender equality beliefs strengthen, the likelihood of lead director appointments decreases for both men and women, with a larger decline observed for women compared to men. Specifically, an increase in gender equality beliefs is associated with an 8.2% (calculated as $\beta_2 + \beta_3$) decrease in the probability of female directors being appointed as lead directors, and a 4.7% decrease for male directors.

¹⁶ CEOs may seek to protect their influence by selecting lead independent directors who are less powerful or formally independent but lack social independence, thereby ensuring that the lead director's role remains largely symbolic and does not challenge their authority (Krause et al., 2017; Li, 2025; Westphal & Zajac, 1995; Zhu & Westphal, 2014).

4.3 Categorized Gender-Related Beliefs and Women in Overall Leadership Positions

In this section, we disaggregate the overall *Gender Equality* index into two specific dimensions: *Gender Education Equality* and *Gender Work Equality*,¹⁷ and examine the impact of the specific dimensions of gender-related belief on women's appointment to leadership positions, aiming to identify key cultural belief drivers of women's advancement. We include each dimension of gender-related beliefs and its interaction with *Female* as explanatory variables in separate models, with overall leadership positions serving as the dependent variable.

Table 5 reports the results. Model (1) examines the effect of *Gender Education Equality* on women's promotion to board leadership positions, revealing a positive and statistically significant interaction effect on leadership appointments, with a coefficient of 0.326. This indicates that in countries with higher levels of gender education equality, the likelihood of female directors being promoted to board leadership positions increases 32.6% more than that of male directors. Model (2) presents the results for *Gender Work Equality* and shows that, as gender-equality beliefs increase, female directors are 12.9% more likely than male directors to be promoted to leadership positions on boards.¹⁸ These results suggest that gender equality in both education and workforce plays an important role in promoting women's advancement into board leadership positions, with the education dimension having a greater impact.

¹⁷ This index is disaggregated based on the content of questions from the World Values Survey (WVS) used to construct the *Gender Equality* index. Appendix B provides a detailed description of these variables.

¹⁸ The overall effect (calculated as $\beta_2 + \beta_3$) shows that female directors are 24% more likely to be appointed in countries with higher gender education equality and 3.9% more likely in those with higher gender employment equality.

5. Endogeneity and Robustness Analysis

5.1 Instrumental Variable Approach

In this section, we examine whether potential endogeneity issues may affect the results. Specifically, reverse causality may arise if the observed relationship is driven by the influence of increased female leadership appointments on cultural beliefs toward gender equality. However, national cultural attitudes are generally stable and unlikely to be substantially altered in the short term due to changes in employment gender gaps. Thus, reverse causality is less likely to be a problem in our analysis. Besides, omitted variables may bias our results, as unobservable factors could simultaneously affect cultural beliefs and gender-related outcomes. We employ a Two-Stage Least Squares Instrumental Variables (2SLS-IV) approach analysis to address potential endogeneity issues arising from omitted variables bias.

Our instrumental variables capture key predictors of national culture across linguistic, religious, and economic dimensions. It includes language separation time (*Language separation times from high gender equality countries*), the proportions of major religious affiliations (*Protestant, Catholic, and Muslim*), and historical national wealth (*GNP per Capita*). These factors play a significant role in establishing the foundations of national culture and reinforcing cross-cultural differences, with religion shaping social values in moral and gender fields; language affecting thought patterns and transmitting values across generations; and the economy influencing general value orientations through social class structures and wealth levels. These variables are related to the cultural variables but not directly related to the leadership position appointment, satisfying both the relevance and exclusion restrictions for instruments. For the model specification, we use these instruments to predict gender equality cultural beliefs in the first stage, and in the second stage, we use the predicted cultural beliefs from the first stage as the independent variable and conduct the same regressions as the baseline.

In accordance with Burns et al. (2025), we exclude the country fixed effects in the IV models, as the instrumental variables, defined at the country level, inherently account for variation in national characteristics. Also, since these variables are historical and time-invariant, the inclusion of country fixed effects would absorb their variation and reduce the effectiveness of instrumental variables. To maintain consistency in model specification and enhance comparability between the baseline and IV models, we re-estimate the baseline model without country fixed effects in Model (1) of Table 6. The result is consistent with the baseline finding, showing a significantly positive interaction effect of *Female* $\times$ *Gender Equality Beliefs* on leadership positions. It suggests the robustness of the main results when the country's fixed effects are excluded and provides an empirical basis for the subsequent IV tests.

Models (2)-(3) of Table 6 examine the IV model using language separation time as the instrument. Language separation time, derived from glottochronology, estimates the time since two languages diverged from a common ancestor based on shared basic vocabulary, reflecting the cultural difference between two countries. These data are collected from Spolaore and Wacziarg (2016). To capture this cultural distance related to gender norms, we construct the language separation time by calculating the average difference in language separation times between this country and each of the top one-third of countries ranked by gender equality score.¹⁹ Countries with a longer separation time from those with strong gender-equality beliefs are expected to have weaker gender-equality beliefs.

As the results show, the first-stage estimate reveals a negative and statistically significant coefficient in *Language separation time*, indicating a negative relationship between language separation and gender-equality beliefs, which supports our expectation. F-statistics for the first-stage regressions are significant, with values greater than 1000. The second-stage result

¹⁹ These countries include France, Norway, Finland, Netherlands, Sweden, Spain, United Kingdom, Canada, Switzerland, Slovenia, Hungary, U.S.A, Australia, New Zealand, Germany, Italy, Argentina, Poland, and Japan.

indicates that the interaction term *Female* $\times$ *Fitted Gender Equality* has a positive and statistically significant effect on *leadership roles*, which is consistent with our main findings. It suggests that when using language separation time as an instrumental variable, the positive effect of gender-equality beliefs on women's appointments to board leadership positions remains robust, ensuring our results are not affected by potential endogeneity issues.

We also examine the IV model using religious composition and historical national income as instrumental variables in models (4) to (7). Models (4) to (5) present IV estimates based on historical national wealth as an instrumental variable, and Models (6) to (7) show models based on religious composition. Following La Porta et al. (1999), religious composition is measured by the percentage of a country's population affiliated with each of the three major global religions in 1980: Roman Catholicism, Protestantism, and Islam; Historical national wealth is calculated using the logarithm of gross national product (GNP) per capita from 1970 to 1995. Both sets of variables are sourced from La Porta et al. (1999).

In the first-stage regressions, Model (4) indicates that higher historical *GNP per capita* is positively associated with gender equality beliefs, implying that historically wealthier countries tend to have stronger gender equality beliefs. Model (6) shows that proportions of *Protestant* and *Catholic* populations are positively associated with gender equality scores, while a proportion of *Muslims* is negatively associated. It suggests that countries with larger Protestant and Catholic populations tend to exhibit stronger gender equality beliefs, whereas those with larger Muslim populations have lower levels of such beliefs. The F-statistics for the first-stage regressions in both panels are statistically significant, supporting the validity of the instruments. In the second-stage regressions, models (5) and (7) report a positive and statistically significant interaction effect of *Female* $\times$ *Fitted Gender Equality*. It suggests that when religious composition or historical national wealth is used as an instrument, the results remain consistent with our main findings, confirming endogeneity issues do not exist in our studies.

5.2 Alternative Measures of Gender-Related Values

To further validate the influence of gender-related cultural beliefs on the appointment of women to board leadership positions, we employ alternative measures of gender equality beliefs to capture broader and more indirect cultural dimensions of gender norms. Research suggests that certain cultural traits are more prominent in societies with stronger gender equality awareness, for example, societies with more egalitarian gender-role attitudes typically have higher levels of social tolerance and trust, as well as a lower tolerance for violence against women (Burns et al., 2025; Flood & Pease, 2006; Kistler et al., 2015; Welzel, 2013). Based on this, we construct acceptance of violence against women (*Harmony*), societal intolerance (*Tolerance*), and trust (*Trust*) as alternative measures of gender equality beliefs and examine their influence on women's appointment to board leadership positions.

We adopt the same methodology used in constructing the gender equality beliefs index to develop these indirect cultural belief indices.²⁰ The data used to construct these variables is derived from the World Values Survey (WVS). Specifically, the variable *Harmony* is constructed based on the responses to questions about whether violence against a wife or children is ever justified. A high *Harmony* value indicates low acceptance of such violence. The variable *Trust* focuses on responses assessing whether people generally believe others can be trusted or tend to think others will take advantage of them, with higher values indicating greater societal trust. Besides, the variable *Tolerance* is measured based on responses related to attitudes toward racial discrimination and immigrants, with higher values suggesting greater tolerance and acceptance of diversity.

In the regression model, we include three gender-related cultural variables: *Harmony*, *Tolerance*, and *Trust*, as alternative measures of *Gender Equality* attitudes, as well as an

²⁰ Appendix B provides detailed descriptions of these three variables.

interaction term between each of them and the *Female* indicator. Table 7 reports the results that all interaction terms between *Female* and the alternative cultural variables are positive and statistically significant. It suggests that women are more likely than men to be appointed to board leadership positions in cultural environments that have stronger rejection of violence, greater tolerance for diversity, and higher levels of interpersonal trust. These findings further show the robustness of the relationship between gender-related cultural beliefs and women's leadership appointments when alternative indirect measures of gender-related values are employed.

5.3 Additional Robustness Test

In this section, we conduct several additional robustness checks to further validate our findings. First, we re-estimate the baseline regression using firm-fixed effects instead of industry-fixed effects to account for unobserved heterogeneity at the firm level. The results, reported in Model (1) of Table 8, show that the *Female* $\times$ *Gender Equality* interaction term remains positive and statistically significant. It suggests that our main finding is robust regardless of whether fixed effects are specified at the industry or firm level. Second, given that U.S. firms constitute over 50% of the sample, we re-run the baseline analysis excluding U.S. firms to mitigate potential concern regarding sample selection bias. As shown in Model (2) of Table 8, the results remain consistent with our main findings. It indicates that the positive and significant relationship between gender equality beliefs and women's appointment to leadership roles is not driven solely by the dominance of U.S. firms but rather is applicable across a broader set of firms. Thirdly, we re-run the baseline analysis using the Probit regression model, as our dependent variable *Leadership roles* is a dummy variable, and the Probit model is specifically designed for the binary classification model, accurately estimating the probability of an observation belonging to one of two categories based on specific characteristics. The results in table 9 are

consistent with the baseline analysis, indicating that results remain robust when employing the Probit model.

6. Cross-sectional analysis

Given the positive relationship observed between gender-equality beliefs and female directors' promotion to board leadership roles, we further assess how the extent of dependence on these beliefs influences this relationship, in order to examine the critical role of gender equality beliefs. If these beliefs truly play a key role, the extent to which women attain these leadership positions should be influenced by the degree of reliance on these beliefs. Specifically, in environments that significantly rely on these beliefs, the gender equality beliefs may exhibit greater influence on corporate decision-making, resulting in more women being appointed to board leadership positions. We thus expect the relationship between gender equality beliefs and women in board leadership positions to be more pronounced in environments that heavily depend on these beliefs. Director qualifications, firms' levels of internationalization, and economic policy uncertainty are used to measure the reliance on these beliefs.

6.1 Director's Relevant Experience

The appointment and selection of board leaders are generally based on individuals' human capital, including knowledge, education, skills, and experience. Individuals with higher qualifications are more likely to be prioritized for appointments as board leaders. However, when candidates have weak or similar qualifications, leadership appointments tend to reflect decision-makers' preferences, which are largely shaped by local cultural norms. In other words, when directors have similarly inadequate qualifications, decision-makers are more likely to rely on local cultural beliefs to make leadership appointments. Based on this association, we employ low director qualifications to represent the great dependence on cultural attitudes on leadership appointment decisions, and assess its influence on the relationship between gender

equality beliefs and women's appointments in board leadership positions. We expect that the relationship should be more pronounced when directors have weaker qualifications.

First, we use educational qualifications as a proxy for director qualifications. Educational qualifications, as a traditional and widely accepted measure of human capital, reflect an individual's learning potential and their professional expertise and skills (Barro & Lee, 2013; Becker, 2002; Schroder et al., 1967). We split the sample into two sub-samples based on whether the directors have a master's degree or higher and perform independent regression analysis for each sub-sample. Model (1) to (2) in Table 10 reports the results, showing the positive effect of *Female* $\times$ *Gender Equality* on *Leadership roles* is more significant in the sub-sample of directors without master's and higher degrees. The difference across subsamples is statistically significant at the 10% level ($p < 0.1$).

Second, we use directors' executive experience as a proxy for director qualifications. Executive experience equips directors with essential traits for board leadership roles, including the ability to navigate governance processes efficiently and an in-depth understanding of business strategy and boardroom dynamics (Bhardwaj et al., 2025). Following Field et al. (2020) and Fedaseyev et al. (2018), executive experience is identified by whether individuals hold, or have previously held, executive positions. The sample is divided into two sub-samples based on whether the directors have previous executive experience, and regression analysis was conducted separately for each group. We report the results in models (3) and (4) of Table 10, indicating that the positive effect of *Female* $\times$ *Gender Equality* on *Leadership roles* holds only in the sub-sample of directors without executive experience. The difference across subsamples is statistically significant at the 1% level ($p < 0.01$).

These results are consistent with our expectations and suggest that, in the sample of directors with weaker qualifications, gender-equality beliefs have a more significantly positive impact

on the relative likelihood of female directors being appointed to leadership positions compared with men. This finding indicates that gender equality cultures exert a greater influence on board governance decisions when decision-makers tend to follow local cultural norms. It also suggests that a gender equality culture can eliminate informal barriers to female leadership and promote the advancement of less-qualified female directors to board leadership.

6.2 Board's Internationalization

The internationalization of a board of directors influences its leadership appointment decisions through their reliance on local cultural beliefs. Specifically, when a board has a higher proportion of foreign directors, its governance practices are more likely to be shaped by foreign cultures or a mix of different cultural perspectives; in contrast, boards with a lower proportion of foreign directors may rely more heavily on local cultural norms to develop governance practices, including leadership appointment decisions. We use the board's internationalization as a proxy of reliance on local cultural practices at the board level to examine its impact on the relationship between gender equality beliefs and women's appointments to board leadership positions. The board's internationalization is measured by the board nationality mix ratio, calculated as the proportion of board members from foreign countries.

Given the negative association between board nationality mixed ratios and their reliance on local cultural beliefs, we expect that in companies with lower board nationality mixed ratios, the impact of gender-related cultural beliefs on women's access to board leadership positions is more pronounced. We partition the sample into two sub-samples based on the median value of the board nationality mix ratio and conduct separate regression analyses for each. Model (5) to (6) of Table 10 reports the results, showing the interaction *Female* $\times$ *Gender Equality* has a greater and more statistically significant effect in the subsamples with low board nationality mix ratios than in those with high ratios. The difference across subsamples is statistically

significant at the 10% level ($p < 0.1$). This result supports the expectation that gender-equality beliefs exert a stronger influence on women's appointments to board leadership positions when boards exhibit lower levels of internationalization. This pattern indicates that gender-equality cultural beliefs play a more prominent role in leadership appointment decisions when boards are more locally embedded, supporting the interpretation that national culture operates as a governance input when decision-makers rely more heavily on domestic norms.

6.3 Economic Policy Uncertainty Index

The country's economic policy uncertainty index (EPU), constructed based on the frequency of newspaper articles related to policy uncertainty in leading newspapers (Al-Thaqeb & Algharabali, 2019), captures the degree of policy-related economic uncertainty over time and affects a firm's reliance on local culture beliefs in leadership appointment decisions. Specifically, when economic policy guidance is unclear or unreliable, firms usually turn to familiar sources for guidance to navigate this uncertainty. National culture, as a reliable reference for businesses, offers widely acknowledged values and practices that organizations can follow (Guo et al., 2025; Li et al., 2021), and firms that follow these culturally acceptable norms increase the legitimacy and acceptability of their behavior. Therefore, in a high EPU environment, decision-makers are more inclined to use cultural norms for strategic guidance and leadership appointments. We use the Economic Policy Uncertainty (EPU) Index as a proxy to examine the impact of reliance on domestic cultural beliefs at the country level on the relationship between gender equality beliefs and women's appointments to board leadership positions.

Given the positive association between EPU and reliance on local cultural beliefs, we expect gender-equality beliefs to exert a stronger influence on women's appointments to leadership positions in countries with high EPU. To test this expectation, we divide the sample into two

sub-samples based on the median value of the EPU Index and conduct separate regression analyses for each.²¹ The results in Model (7) to (8) in Table 10 show the coefficient of the *Female* × *Gender Equality* interaction term on *Leadership Roles* is larger in magnitude and more statistically significant in the high-EPU sub-sample, which supports our expectation. We find a statistically significant difference between subsamples ($p < 0.01$). These findings indicate that gender-equality culture becomes particularly influential when formal institutional guidance is less reliable, highlighting culture's role as a substitute governance mechanism under uncertainty.

7. Additional Analysis

In this section, we explore the economic consequence of women holding board leadership positions and investigate whether appointments of female board leaders driven by gender equality beliefs can improve firm financial performance. Specifically, we construct a firm-year sample based on the baseline sample and develop an additional regression model. We use return on assets (*ROA*) and *Tobin's Q* as dependent variables to measure a firm's financial performance.²² The independent variable *Female Board Leader* assess whether board leadership positions, including the board chair, lead director, or chair of a key board committee, are held by women. *Gender Equality* cultural beliefs and its interaction term with *Female Board Leader* are included to examine the moderating effect of gender equality on relationship between female board leader and the firm's financial performance. Control variables at multiple levels, such as board, firm, and country, are included.²³

²¹ The EPU index is constructed by Baker et al. (2016).

²² Appendix A provides definitions for these variables.

²³ Control variables related to board and governance include board independence ratios (*Board independent ratio*), average age (*Average director age*), educational qualifications (*average director qualification*), tenure (*average director tenure*) of board members, *Female CEO*, and *CEO Duality*. Financial control factors include the Price to Sales Per Share (*Price/Sales Per Share*), *Stock return*, *Sales Growth*, debt-to-assets ratio (*Debt/Assets*). National-level control variables are consistent with our baseline model, including GDP (*GDP*), fertility rate (*Fertility rate*), the proportion of the population aged 60 and above (*Percentage of population over age 60*), the female labor force

Table 11 reports the additional regression result. Columns (1) and (2) report the effects on return on assets, and columns (3) and (4) report the results for Tobin's Q. We include only *Female Board Leader* as the independent variable in columns (1) and (3), to examine the direct impact of female board leadership on corporate financial performance. The result shows the coefficients for *Female Board Leader* are positive in both models, suggesting that female board leaders have a positive impact on the firm's return on assets and Tobin's Q. It indicates that firms with female board leadership have better financial performance than those led by male leaders. In the column (2) and (4), we add the *Gender Equality* beliefs and its interaction terms with *Female Board Leader*, in order to assess how the effect of female leadership on firm performance varies with the degree of cultural gender equality. The result demonstrates that the interaction term *Female Board Leader* $\times$ *Gender equality* has a positive coefficient in both models, indicating the association between female board leadership and financial performance strengthens as gender equality beliefs increase. In one word, these results indicate that female board leaders have a positive economic impact, particularly in environments with stronger gender equality norms.

8. Conclusion

Despite a significant increase in women's representation on boards globally, women remain consistently underrepresented in board leadership positions. This study analyzes a global sample of female directors' advancement to board leadership roles to explore the impact of gender-related cultural beliefs on the women's representation in these positions. We document that positive cultural attitudes on gender equality significantly improve women's overall representation in board leadership roles. This influence of gender-equality beliefs is driven by

participation rate (*Female labor participation rate*), and the Women, Business and the Law Index score (*Women Business and the Law Index Score*).

two specific dimensions of gender-equality beliefs: support for women's education and their participation in the workforce. We find among these board leadership positions, gender equality beliefs tend to promote women's appointments to leaderships positions with real authority and significant governance duties, including board chairs and major committee chairs, rather than symbolic leadership positions, including lead directors. Moreover, this relationship is especially pronounced when firms tend to rely on prevailing cultural norms for leadership appointment decisions, as evidenced in firms with less qualified directors, lower board nationality diversity, and countries with greater economic policy uncertainty. We also find that appointing women to board leadership positions can significantly improve firm financial performance, particularly in countries with stronger gender equality beliefs.

We are conscious of the limitations of our study. First, our sample includes relatively few observations from developing countries due to data availability constraints, limiting the generalizability of our findings to less economically developed countries. Future research could address this gap by conducting region-specific analysis, particularly in underrepresented areas, to explore whether cultural beliefs operate differently across diverse economic contexts. Second, in cross-sectional analysis, we employ several indirect proxies to measure the organization's reliance on cultural beliefs rather than directly quantifying their reliance level. Future studies could improve this by employing survey-based methods to capture individuals' perceptions of cultural beliefs and obtain more direct insight into the cultural reliance. Despite these limitations, our findings highlight the importance of gender equality cultural beliefs and offer new insights into how women break through the glass ceiling and achieve leadership positions on corporate boards, as well as evidence that women in these roles significantly improve firm's financial performance. The result highlights the value female leaders bring to the corporate world and suggests that achieving true gender equality in leadership positions requires reassessment of cultural norms.

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Figure 1. Trend in Proportion of Women on Boards Over Time

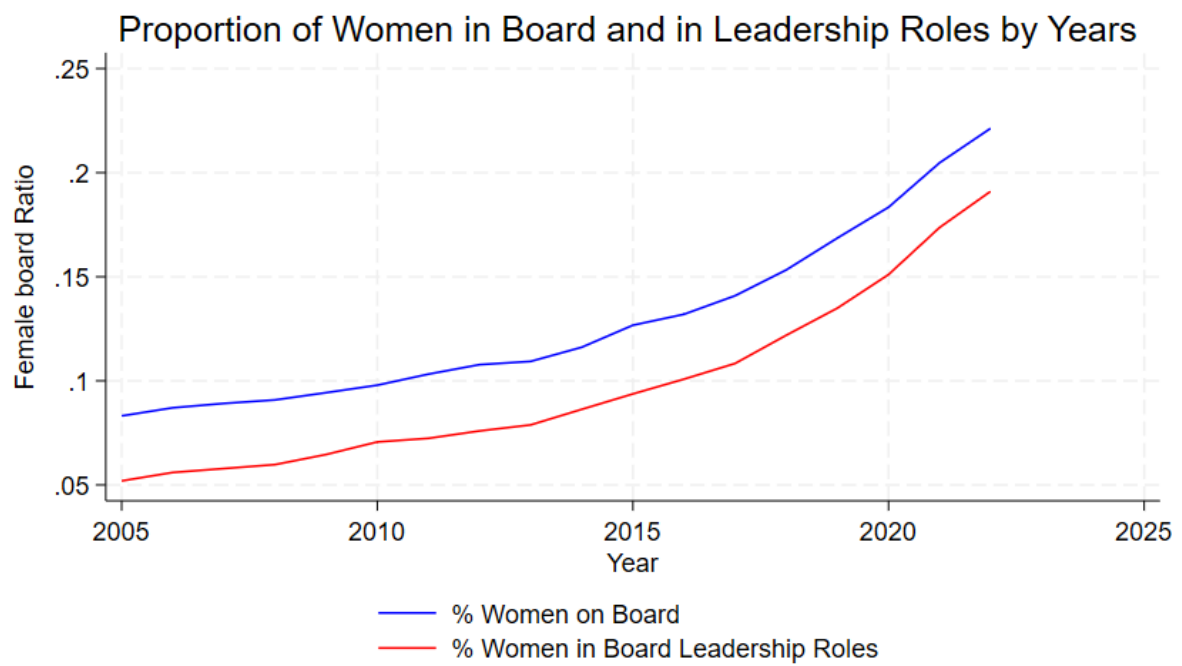


Table 1: Country- level distribution and gender cultural measures

This table presents the country- level distribution and country averages for the culture measures about gender equality. Tables are sorted by country frequency, from largest to lowest. There are 56 countries in total. The cultural gender equality score is derived from responses to the World Values Survey, and it measures the degree to which women are equally educated and accepted at work. Cells with light colours have the lowest five scores, while those with dark colours have the highest five scores.

Countries	Frequency	Percent	Gender equality index
United States	524,734	63.68	0.74
United Kingdom	49,790	6.04	0.76
Canada	40,228	4.88	0.76
Germany	34,805	4.22	0.72
India	25,013	3.04	0.41
Australia	23,332	2.83	0.75
Hong Kong SAR	21,053	2.55	0.59
China	12,013	1.46	0.51
Singapore	8,738	1.06	0.60
Malaysia	7,896	0.96	0.53
France	7,192	0.87	0.83
Netherlands	6,880	0.83	0.79
Spain	6,568	0.80	0.77
Sweden	6,384	0.77	0.79
Japan	6,172	0.75	0.63
Russia	4,081	0.50	0.56
Brazil	3,564	0.43	0.61
Mexico	3,444	0.42	0.55
Thailand	3,324	0.40	0.56
Philippines	3,154	0.38	0.45
Turkey	2,821	0.34	0.49
Norway	2,730	0.33	0.83
Italy	2,546	0.31	0.71
New Zealand	2,203	0.27	0.73
Switzerland	2,081	0.25	0.76
South Korea	1,957	0.24	0.50
Poland	1,715	0.21	0.65
South Africa	1,461	0.18	0.58
Chile	1,311	0.16	0.59
Greece	1,122	0.14	0.60
Finland	850	0.10	0.81
Nigeria	708	0.09	0.42
Argentina	437	0.05	0.69
Pakistan	421	0.05	0.40
Cyprus	415	0.05	0.59
Colombia	412	0.05	0.58
Peru	351	0.04	0.61
Morocco	348	0.04	0.46
Vietnam	248	0.03	0.42
Czechia	192	0.02	0.60
Egypt	191	0.02	0.40
Romania	180	0.02	0.59
Bangladesh	155	0.02	0.40
Ukraine	143	0.02	0.58
Kenya	137	0.02	0.57
Indonesia	121	0.01	0.43
Slovenia	117	0.01	0.75
Jordan	76	0.01	0.40
Zimbabwe	68	0.01	0.53
Kazakhstan	35	0.00	0.51
Hungary	33	0.00	0.75
Azerbaijan	18	0.00	0.44
Kuwait	12	0.00	0.45
Mongolia	8	0.00	0.47
Slovakia	6	0.00	0.55
Qatar	5	0.00	0.48
Total	823,999	100.00	

Table 2: Summary Statistics

This table summarizes our sample, and it includes 133,364 directors, 17,390 companies, and 823,999 director-firm-year observations from 2005 to 2022. Panel A provides the percentage of female directors over the time period. Panel B shows the gender distribution and female ratio for each leadership positions. Panel C includes statistics for each variable at the director, firm, and country levels.

Panel A: Female representation in leadership positions								
Leadership Roles	Female		Male		Female ratio			
Chairman	5,127		108,427		5%			
Lead director	1,722		19,441		8%			
Committee chairman	33,147		194,183		15%			
Panel B: Sample description								
VARIABLES	Obs	Mean	SD	Min	P25	Median	P75	Max
Leadership Positions								
Leadership Roles	823999	0.394	0.489	0	0	0	1	1
Chairman	823999	0.138	0.345	0	0	0	0	1
Lead director	823999	0.026	0.158	0	0	0	0	1
Committee chairman	823999	0.276	0.447	0	0	0	1	1
Gender and cultural factors								
Female	823999	0.147	0.354	0	0	0	0	1
Gender equality	823999	0.712	0.084	0.398	0.718	0.724	0.768	0.828
Education and Career Experience								
Bachelor's degree	823999	0.875	0.331	0	1	1	1	1
Master's degree	823999	0.474	0.499	0	0	0	1	1
MBA degree	823999	0.298	0.457	0	0	0	1	1
Financial experience	823999	0.159	0.366	0	0	0	0	1
Academic experience	823999	0.254	0.435	0	0	0	1	1
Law experience	823999	0.118	0.323	0	0	0	0	1
Political experience	823999	0.209	0.407	0	0	0	0	1
Board and Director Characteristics								
Board size	823999	9.39	3.245	4	7	9	11	24
Board independent ratio	823999	0.797	0.14	0.2	0.727	0.857	0.889	1
CEO duality	823999	0.038	0.191	0	0	0	0	1
Director tenure	823999	5.151	5.182	0	1.5	3.5	7.1	26.2
Female CEO	823999	0.004	0.067	0	0	0	0	1
Financial Characteristics								
Return on asset	823999	-0.006	0.184	-1.157	-0.003	0.027	0.068	0.285
Debt/Assets	823999	0.193	0.193	0	0.024	0.145	0.306	0.834
R&D/Assets	823999	0.032	0.079	0	0	0	0.021	0.482
Capital expenditure/Sales	823999	0.111	0.306	0	0.014	0.033	0.076	2.535
Ln(assets)	823999	7.218	2.205	1.65	5.735	7.255	8.721	12.897
Ln(sales)	823999	6.435	2.432	-7.618	4.927	6.571	8.104	13.319
Country Institutional Environment								
Female labor participation rate	823999	0.732	0.18	0.197	0.722	0.819	0.827	0.961
GDP	823999	0.012	0.008	0	0.003	0.014	0.018	0.026
Fertility rate	823999	1.785	0.291	0.701	1.657	1.821	1.96	5.948
Percentage of population over age 60	823999	0.145	0.034	0.01	0.127	0.143	0.164	0.294
Women Business and the Law Index Score	823999	0.869	0.076	0.294	0.838	0.838	0.912	1

Table 3: Relation of overall leadership roles to gender and culture

This table presents the results of an OLS regression that examines the impact of gender indicators, cultural gender equality variables, and their interaction on major leadership positions on board. For dependent variables, *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on World Values Survey. The regressions include controls for director, board, firm and country characteristics. Appendix A provides detailed variable definitions. Fixed effects for industry (with a 2-digit SIC code), year, and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Leadership Roles					
Female	-0.105*** (0.003)	-0.188*** (0.022)	-0.179*** (0.022)	-0.187*** (0.022)	-0.191*** (0.022)	-0.191*** (0.021)
Gender equality		-0.114** (0.055)	-0.127** (0.055)	-0.085 (0.054)	-0.072 (0.054)	-0.046 (0.054)
Female*Gender equality		0.117*** (0.032)	0.102*** (0.031)	0.176*** (0.031)	0.186*** (0.031)	0.186*** (0.031)
Bachelor's degree			-0.002 (0.004)	0.009** (0.004)	0.011*** (0.004)	0.011*** (0.004)
Master's degree			-0.004 (0.004)	-0.002 (0.003)	-0.001 (0.003)	-0.001 (0.003)
MBA degree			0.026*** (0.004)	0.032*** (0.004)	0.033*** (0.004)	0.033*** (0.004)
Financial experience			0.130*** (0.003)	0.137*** (0.003)	0.137*** (0.003)	0.137*** (0.003)
Academic experience			0.008** (0.003)	0.010*** (0.003)	0.009*** (0.003)	0.009*** (0.003)
Law experience			0.032*** (0.005)	0.032*** (0.004)	0.032*** (0.004)	0.032*** (0.004)
Political experience			0.046*** (0.003)	0.056*** (0.003)	0.059*** (0.003)	0.059*** (0.003)
Board size				-0.024*** (0.000)	-0.020*** (0.001)	-0.020*** (0.001)
Board independent ratio				0.045*** (0.010)	0.070*** (0.010)	0.074*** (0.010)
CEO duality				0.611*** (0.002)	0.613*** (0.002)	0.613*** (0.002)
Director tenure				0.009*** (0.000)	0.009*** (0.000)	0.009*** (0.000)
Female CEO				-0.210*** (0.008)	-0.214*** (0.008)	-0.215*** (0.008)
Capital expenditure/Sale					-0.006** (0.003)	-0.007** (0.003)
Return on asset					-0.040*** (0.005)	-0.039*** (0.005)
Debt/Assets					-0.000 (0.005)	-0.001 (0.005)
R&D/Assets					-0.026* (0.015)	-0.028* (0.015)
Ln(assets)					-0.012*** (0.001)	-0.012*** (0.001)
Ln(sales)					0.001 (0.001)	0.001 (0.001)
Female labor participation rate						0.017*** (0.003)
GDP						3.578*** (0.464)
Fertility rate						-0.013 (0.011)
Percentage of population over age 60						-0.042 (0.228)
Women Business and the Law Index Score						-0.057* (0.032)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	823,999	823,999	823,999	823,999	823,999	823,999
R-squared	0.021	0.021	0.032	0.118	0.119	0.119

Table 4: Relation of specific leadership positions to gender and culture

This table presents the results of an OLS regression that examines the impact of gender indicators, cultural gender equality variables, and their interaction on particular chairman positions on boards and committees. Dependent variables take a value of one if the director is the board chairman, executive board chairman, non-executive board chairman, chairman of the major committees (audit, nomination, remuneration, and governance), or chairman of a specified committee, and zero otherwise. *Female* is valued one if the board director is female, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on World Values Survey. The regressions include the same controls as baseline model (Column 6 in Table 3). Appendix A provides detailed variable definitions. Fixed effects for industry (with a 2-digit SIC code), year, and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Chairman	Committee Chair	Chairman of				Lead Director
			Audit committee	Governance committee	Compensation committee	Nomination committee	
Female	-0.113*** (0.012)	-0.068*** (0.019)	-0.067*** (0.013)	-0.012* (0.007)	-0.023 (0.014)	-0.020 (0.013)	0.006 (0.004)
Gender equality	-0.073* (0.038)	0.027 (0.048)	-0.046 (0.030)	-0.076*** (0.015)	-0.024 (0.027)	-0.036 (0.027)	-0.047*** (0.009)
Female*Gender equality	0.041** (0.017)	0.107*** (0.028)	0.090*** (0.019)	0.033*** (0.011)	0.036* (0.021)	0.024 (0.019)	-0.035*** (0.006)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	823,999	823,999	823,999	823,999	823,999	823,999	823,999
R-squared	0.275	0.091	0.113	0.046	0.031	0.029	0.020

Table 5: Relation of overall leadership positions to detailed gender-related culture factors

This table presents the results of an OLS regression that examines the impact of gender indicators, detailed cultural gender equality variables, and their interaction on overall leadership positions. *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, or chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. *Gender equality education* and *Gender work equality* are measured as distinct dimensions of the *Gender equality* index derived from the World Values Survey. The regressions include the same controls as baseline model (Column 6 in Table 3). Appendix A provides detailed variable definitions. Fixed effects for industry (with a 2-digit SIC code), year, and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)
	Leadership roles	
Female	-0.310*** (0.032)	-0.149*** (0.017)
Gender education equality	-0.084* (0.049)	
Female*Gender education equality	0.326*** (0.041)	
Gender work equality		-0.090*** (0.033)
Female*Gender work equality		0.129*** (0.025)
Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Country FE	Yes	Yes
Observations	823,999	823,999
R-squared	0.119	0.119

Table 6: Instrumental Variable Approach

This table presents the results of a two-stage least squares (2SLS) instrumental variable (IV) analysis examining the impact of gender-related values on board female leadership's role. *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on World Values Survey. Column (1) presents the baseline estimates using the same fixed-effect specification as the IV tests. Column (2) and (3) report the IV regression results using *language separation times from countries with high levels of gender equality* as the instrument. Column (4) to (5) presents results using proportion of major religions (*Protestant*, *Catholic*, or *Muslim*) as the instrument. Column (6) to (7) displays the results using national wealth measured as *GNP per capita* between 1970 and 1995 as the instrument. Definitions of IV variables are provided in Appendix A. Those regressions of both first and second stage include the same set of control variables as the baseline specification shown in Column 6 of Table 3. Industry fixed effects (based on 2-digit SIC codes) and year fixed effects are included. Robust standard errors are clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Leadership roles	First Stage Gender equality	Second Stage Leadership roles	First Stage Gender equality	Second Stage Leadership roles	First Stage Gender equality	Second Stage Leadership roles
Language separation times		-0.006** (0.000)					
GNP per Capita				0.045** * (0.001)			
Protestant						0.001** * (0.000)	
Catholic						0.001** * (0.000)	
Muslim						0.001** * (0.000)	
Female	0.116*** (0.027)						
Gender equality	-0.176*** (0.022)		-0.256*** (0.028)		-0.228*** (0.025)		-0.237*** (0.026)
Fitted Gender equality			-2.503*** (0.301)		0.222*** (0.047)		0.296*** (0.076)
Female*Gender equality	0.163*** (0.031)						
Female*Fitted Gender equality			0.272*** (0.037)		0.234*** (0.036)		0.246*** (0.036)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	No	No	No	No	No	No	No
Observations	823,999	745,357	745,357	823,999	823,999	823,999	823,999
R-squared	0.117	0.903	0.117	0.911	0.117	0.878	0.117

Table 7: Alternative Measures of Gender-Related Values.

This table presents the results of an OLS regression that examines the impact of gender indicators, alternative gender cultural variables, and their interaction on overall leadership positions. *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, or chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. Alternative gender cultural variables include *Harmony*, *Tolerance*, and *Trust* that are identified from World Values Survey. The regressions include the same controls as baseline model (Column 6 in Table 3). Fixed effects for industry (with a 2-digit SIC code), year, and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)	(3)
		Leadership Roles	
Female	0.089*** (0.021)	-0.040*** (0.006)	-0.091*** (0.012)
Tolerance	-0.001 (0.040)		
Female*Tolerance	0.231*** (0.032)		
Harmony		-0.072 (0.051)	
Female*Harmony		0.234*** (0.052)	
Trust			-0.036 (0.036)
Female*Trust			0.073*** (0.028)
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	823,999	823,999	823,999
R-squared	0.119	0.119	0.119

Table 8: Robustness Test of Alternative Fixed Effects Model and Exclusion of U.S. Samples.

This table reports the results of robustness checks and presents estimates from OLS regressions examining the impact of gender indicators, gender-equality values, and their interaction on appointments to key board leadership positions. *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on World Values Survey. Model (1) presents robust results using the full sample with firm fixed effects included. Model (2) reports robust results based on a sample that excludes U.S. firms. Those regressions include the same set of control variables as the baseline specification shown in Column 6 of Table 3. Appendix A provides detailed variable definitions. Fixed effects for firm, year, industry (with a 2-digit SIC code), and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)
	Full sample	Excluding U.S. Firms
Female	-0.188*** (0.023)	-0.188*** (0.023)
Gender equality	-0.081 (0.050)	-0.180*** (0.066)
Female*Gender equality	0.182*** (0.032)	0.163*** (0.034)
Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	No	Yes
Country FE	Yes	Yes
Firm FE	Yes	No
Observations	823,881	299,265
R-squared	0.175	0.115

Table 9: Robustness Test of Probit Model

This table presents the results of a Probit regression that examines the impact of gender indicators, cultural gender equality variables, and their interaction on major leadership positions on the board. For dependent variables, *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on World Values Survey. The regressions include the same controls as baseline model (Column 6 in Table 3).²⁸ Appendix A provides detailed variable definitions. Fixed effects for industry (with a 2-digit SIC code), year, and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) Leadership Roles
Female	-0.639*** (0.075)
Gender equality	-0.150 (0.170)
Female*Gender equality	0.658*** (0.105)
Controls	Yes
Year FE	Yes
Industry FE	Yes
Country FE	Yes
Observations	792,858

²⁸ Among control variables, *CEO Duality* is omitted from the probit regression model due to its perfect prediction issues.

Table 10: Cross-Sectional Analysis

This table presents the appointment of women to board leadership positions influenced by gender-related values, taking into account various factors at the director, board, firm, and industry levels. *Leadership Roles* is valued one if the director acts as chairman of the board, lead directors, chair of major committees (audit, nomination, remuneration, and governance), and zero otherwise. *Female* takes valued of one if the board director is female, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on World Values Survey. Model (1)- (2) investigates how a director's educational background moderates the relationship between gender-related values and the appointment of women to board leadership positions, as measured by whether the director holds master's or higher degree or not. Model (5) – (6) analyses the impact of board internationalization, as measured by board *Nationality mix ratio*. Model (7) to (8) evaluates the impact of the *Country-Level Economic Policy Uncertainty Index*. Regression analysis for Models (1) to (2) employs the same set of control variables as the baseline model in Column 6 of Table 3, but excludes *Bachelor's degree*, *Master's degree*, and *MBA degree* to avoid multicollinearity. Models (3) to (8) fully adopt the set of control variables from the baseline model. Appendix A provides detailed variable definitions. Fixed effects for industry (with a 2-digit SIC code), year, and country are included. Robust standard errors are clustered at the firm level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Directors without master's and higher degree	Directors with master's and higher degree	Directors without related executive experience	Directors with related executive experience	Low board nationality mix ratio	High board nationality mix ratio	Countries with a Low EPU score	Countries with a High EPU score
Female	-0.224*** (0.032)	-0.151*** (0.029)	-0.279*** (0.026)	-0.104*** (0.036)	-0.214*** (0.026)	-0.106** (0.044)	-0.192*** (0.026)	-0.298*** (0.051)
Gender equality	-0.021 (0.079)	-0.077 (0.094)	0.015 (0.079)	-0.129 (0.088)	-0.089 (0.072)	0.05 (0.086)	-0.330*** (0.073)	-0.144 (0.132)
Female*Gender equality	0.236*** (0.045)	0.123*** (0.041)	0.352*** (0.039)	0.044 (0.05)	0.220*** (0.037)	0.063 (0.061)	0.169*** (0.036)	0.353*** (0.071)
Diff (1)- (2)	0.113*		0.308***		0.157**		-0.183**	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	433,639	390,360	350,980	473,019	504,042	262,863	380,259	383,156

Table 11: Female Board Leader and Financial Performance

This table reports the results of additional analysis and presents estimates from OLS regressions examining the impact of the female board leaderships, gender-equality values, and their interaction on financial performance ratios. Financial performance ratios include *Return on Assets* and *Tobin's Q* ratio. *Female Board Leader* is valued as one if the board chair, lead director, or major committee chair is a woman, and zero otherwise. *Gender equality* is the country-level gender-egalitarian index based on the World Values Survey (WVS). Model (1) and (3) only include *Female Board Leader* as independent variables. Model (2) and (4) add *Gender equality* and its interaction with *Female Board Leader*. Control variables at multiple levels, such as board, firm, and country, are included. Appendix A provides detailed variable definitions. Fixed effects for year, industry (with a 2-digit SIC code), and country are included. The robust standard errors are clustered by firms. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1) Return on Assets	(2)	(3) Tobin Q	(4)
Female Board Leader	0.025*** (0.002)	-0.019 (0.013)	0.056*** (0.017)	-0.177** (0.084)
Gender equality		-0.102*** (0.032)		-0.046 (0.227)
Female Board Leader*Gender equality		0.064*** (0.019)		0.333*** (0.126)
Board independent ratio	0.076*** (0.009)	0.075*** (0.009)	-0.205*** (0.070)	-0.209*** (0.070)
Average director age	0.001*** (0.000)	0.001*** (0.000)	-0.009*** (0.002)	-0.009*** (0.002)
Average director qualification	-0.003 (0.002)	-0.003 (0.002)	0.016 (0.014)	0.016 (0.014)
Average director tenure	0.007*** (0.000)	0.007*** (0.000)	-0.001 (0.003)	-0.001 (0.003)
Female CEO	-0.008 (0.005)	-0.008 (0.005)	-0.036 (0.041)	-0.036 (0.041)
CEO duality	0.012*** (0.002)	0.012*** (0.002)	0.004 (0.018)	0.004 (0.018)
Price/Sales Per Share	-0.003*** (0.000)	-0.003*** (0.000)	0.020*** (0.001)	0.020*** (0.001)
Stock return	0.033*** (0.001)	0.033*** (0.001)	0.324*** (0.009)	0.325*** (0.009)
Sales Growth	0.003 (0.002)	0.003 (0.002)	0.244*** (0.013)	0.244*** (0.013)
Debt/Assets	-0.069*** (0.007)	-0.070*** (0.007)	0.128** (0.065)	0.126* (0.065)
Female labor participation rate	0.000 (0.006)	-0.001 (0.006)	-0.079** (0.034)	-0.075** (0.034)
GDP	3.936*** (0.506)	3.869*** (0.506)	31.615*** (3.767)	31.266*** (3.770)
Fertility rate	0.026*** (0.007)	0.028*** (0.008)	0.069 (0.058)	0.051 (0.061)
Percentage of population over age 60	-0.556*** (0.138)	-0.473*** (0.148)	0.015 (1.000)	-0.081 (1.060)
Women Business and the Law Index Score	-0.290*** (0.040)	-0.279*** (0.040)	-1.156*** (0.281)	-1.158*** (0.278)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	116,801	116,801	116,801	116,801
R-squared	0.197	0.197	0.335	0.335

Appendix A: Variable Definitions

Variables	Definition	Source
Leadership Roles	A dummy variable equal to 1 if the director serves as the chairman of the board, lead director, or the chair of a major committee (audit, nomination, remuneration, or governance); 0 otherwise.	Boardex
Chairman	A dummy variable equal to 1 if the director is the chairman of the board; 0 otherwise.	Boardex
Lead Director	A dummy variable equal to 1 if the director serves as lead director; 0 otherwise.	Boardex
Committee Chairman	A dummy variable equal to 1 if the director chairs a major committee (audit, nomination, remuneration, or governance); 0 otherwise.	Boardex
Audit Committee Chairman	A dummy variable equal to 1 if the director chairs the audit committee; 0 otherwise.	Boardex
Nomination Committee Chairman	A dummy variable equal to 1 if the director chairs the nomination committee; 0 otherwise.	Boardex
Remuneration Committee Chairman	A dummy variable equal to 1 if the director chairs the remuneration committee; 0 otherwise.	Boardex
Governance Committee Chairman	A dummy variable equal to 1 if the director chairs the governance committee; 0 otherwise.	Boardex
Female	A dummy variable equal to 1 if the director is identified as female; 0 otherwise.	Boardex
Gender equality	Country-level index based on standardized cultural values scores regarding individual perceptions about women's role and right, see appendix B.	World Values Survey (WVS)
Gender education equality	Country-level index based on standardized cultural values scores regarding individual perceptions about women's right to education, see appendix B.	World Values Survey (WVS)
Gender work equality	Country-level index based on standardized cultural values scores regarding individual perceptions about women's right to work, see appendix B.	World Values Survey (WVS)
Bachelor's degree	A dummy variable equal to 1 if the director holds a bachelor's degree; 0 otherwise.	Boardex
Master's degree	A dummy variable equal to 1 if the director holds a master's degree; 0 otherwise.	Boardex
MBA degree	A dummy variable equal to 1 if the director holds an MBA degree; 0 otherwise.	Boardex
Financial experience	A dummy variable equal to 1 if the director holds CFA or CPA credentials or has past/current experience in finance-related functions; 0 otherwise.	Boardex
Academic experience	A dummy variable equal to 1 if the director has a PhD or a background in academia (e.g., university teaching, research institutions); 0 otherwise.	Boardex
Law experience	A dummy variable equal to 1 if the director holds a law degree (e.g., LLB, LLM, JD, or PhD in Law), or has worked as a lawyer, prosecutor, or judge; 0 otherwise.	Boardex
Political experience	A dummy variable equal to 1 if the director has prior work experience in government, and 0 otherwise.	Boardex
Board size	Total number of directors on board.	Boardex
Board independent ratio	Percentage of independent (outside) directors on the board.	Boardex
CEO duality	A dummy variable equal to 1 if the CEO also serves as board chair; 0 otherwise.	Boardex
Director tenure	Number of years the director has served on the board.	Boardex
Female CEO	A dummy variable equal to 1 if the CEO is female; 0 otherwise.	Boardex
Return on asset	Ratio of operating income to total assets.	Compustat
Debt/Assets	Ratio of total long-term debt to total assets.	Compustat
R&D/Assets	Ratio of research and development expenditures to total assets.	Compustat
Capital expenditure/Sales	Ratio of capital expenditures to total sales.	Compustat
Ln(assets)	Natural logarithm of total assets.	Compustat
Ln(sales)	Natural logarithm of total sales.	Compustat
Female labor participation rate	Ratio of female to male labor force participation rate.	OrtizOspina, Tzvetkova, and Roser (2018)
GDP	Total income earned through the production of goods and services within a country in a given year, expressed in current United States dollars, reported in trillions.	World Development Indicators (WDI)

Variables	Definition	Source
Fertility rate	Number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year.	World Development Indicators (WDI)
Percentage of population over age 60	Population ages 60 and above as a percentage of the total population.	World Development Indicators (WDI)
Women Business and the Law Index Score	The index measures how laws and regulations affect women's economic opportunities by calculating the average score for each index (Mobility, Workplace, Pay, Marriage, Parenthood, Entrepreneurship, Assets, and Pension).	World Development Indicators (WDI)
Language separation times from high gender equality countries	Glottochronological language separation time between a country's dominant language and that of countries in the top third for gender equality.	Spolaore and Wacziarg (2009)
GNP per Capita	Natural logarithm of GNP per capita in current US dollars (1940–1995 average).	La Porta et al. (1999).
Protestant	Percentages of population in the Protestant religious faiths in 1980.	La Porta et al. (1999).
Catholic	Percentages of population in the Catholic religious faiths in 1980.	La Porta et al. (1999).
Muslim	Percentages of population in the Muslim religious faiths in 1980.	La Porta et al. (1999).
Tolerance	Country-level tolerance index based on standardized cultural values scores regarding individual's willingness to tolerate or respect difference, see appendix B.	World Values Survey (WVS)
Harmony	Country-level harmony index based on standardized cultural values scores regarding individual's acceptance of violence toward women, see appendix B.	World Values Survey (WVS)
Trust	Country-level trust index based on standardized cultural values scores regarding individuals' beliefs about others' trustworthiness, see appendix B.	World Values Survey (WVS)
Related executive experience	A dummy variable equals 1 if the director has past or current experience in executive positions, including as a CEO; 0 otherwise.	Boardex
Nationality mix ratio	Percentage of board members from foreign countries.	Boardex
Economic policy uncertainty Index	Country level index constructed based on the frequency of newspaper articles related to policy uncertainty in leading newspapers.	Baker, Bloom and Davis (2016)
Female Board Leaders	A dummy variable equals to 1 if board chair, lead director, or committee chair is women, 0 otherwise.	Boardex
Tobin's Q	The ratio of market value plus book value of liabilities to total assets.	Compustat
Average director age	Average age of board members.	Boardex
Average director qualification	Average educational qualification of board members.	Boardex
Average director tenure	Average tenure of board members.	Boardex
Stock return	Annual percentage change in the company's stock price.	Compustat
Price/Sales Per Share	Ratios of year-end closing price to sales per share.	Compustat
Sales Growth	Annual percentage change in the company's sales.	Compustat

Appendix B: World Values Survey Indices from Survey Questions

The World Values Survey questions (www.worldvaluessurvey.org) employed for the cultural value measures are listed below. We draw on data from WVS waves 5 (2005–2009), wave 6 (2010–2014), and wave 7 (2017–2022) to closely match with our board and financial datasets. For some gender-related dimensions, multiple survey questions are used, and we average the responses of these questions to construct a gender-related index. To enhance measurement consistency and reduce error, we reverse adjust some items based on the question content, so that higher values consistently reflect more egalitarian views regarding women's roles in society. Besides, since WVS responses vary in scale (e.g., 1–3, 1–5, 1–10, or binary 0/1), we rescale all responses to a standardized 0–1 range, ensuring consistent aggregate across different questions and survey waves.

Gender equality index

1. Disagree with: University is more important for a boy than for a girl.
2. Disagree with: When jobs are scarce, men should have more right to a job than women.
3. Disagree with: Problem if women have more income than husband.
4. Agree with: Job best way for women to be independent.
5. Disagree with: Pre-school child suffers with working mother.

Gender education

1. Disagree with: University is more important for a boy than for a girl.

Gender work

1. Disagree with: Men should have more right to a job than women.
2. Disagree with: Problem if women have more income than husband.
3. Agree with: Job best way for women to be independent.
4. Disagree with: Pre-school child suffers with working mother.

Harmony

1. Never Justifiable: For a man to beat his wife.
2. Never Justifiable: Parents beating children.

Tolerance

1. Disagree with: When jobs are scarce, employers should give priority to (nation) people than immigrants.

Trust

1. Agreed with: Most people can be trusted.
 2. Disagree with: Do you think most people try to take advantage of you.
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