Balance rather than Critical Mass or Tokenism: Gender Diversity, Leadership and Performance in Financial Firms

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Abstract
Purpose: This study analyzes how board's gender diversity, and more specifically a gender-balanced configuration—i.e., a proportion of women in the boardroom ranging between 40% and 60%—affects economic and risk oriented performance in financial firms.
Design/methodology/approach: The empirical application uses a rich dataset that includes detailed accounting and organizational information for all financial firms in the Costa Rican industry during the period 2000-2012. The proposed hypotheses are tested using panel data (fixed-effects) regression models that emphasize that bank performance is affected by various dimensions of the banks' gender diversity.
Findings: The longitudinal analysis of the Costa Rican banking industry reveals that, unlike a proportion indicating a particular critical mass of women on the board, a balanced gender configuration yields superior economic performance (ROA and net intermediation margin). Additionally, the findings show that the performance benefits of gender diversity only exists in the presence of a gender balanced board configuration, and that this positive effect is not conditioned by the presence of women leadership in the corporate hierarchy (Chair or CEO).
Originality/value: The paper further explores the influence of board gender diversity on organizational performance by adopting an approach to the gender diversity-performance relationship that goes beyond the mere representation of women within the corporate hierarchy.

Keywords: Gender diversity, gender balanced board, banking, financial firms, economic performance, risk performance

Article classification: Research paper

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"Those arguing that women leaders are different, and better, may have the best of intentions. But they are piling flimsy evidence on dubious argument to produce politically correct hokum. In some societies, such claims risk reinforcing stereotypes about the sort of job that women are 'good for'. The only enlightened policy for selecting leaders is to judge people purely on their individual merits. Anything else is just prejudice in disguise."
—Brett Ryder (The Economist, 'Sex in the boardroom'. June 6th, 2015).[1]

1. Introduction

Women within leadership positions and board gender diversity are suspected to influence economic and risk-oriented performance metrics of organizations. Yet, empirical findings are less than conclusive (e.g., Adams and Ferreira, 2009; Jeong and Harrison, 2017). In this study, we argue that the benefits of gender diversity in the upper echelons of organizations comes not from a mere token presence of women, nor from a position of absolute or proportional critical mass, as is found in previous empirical studies (Ararat *et al.*, 2015; Joecks *et al.*, 2013), but rather from a balanced gender distribution. Beyond the mere representation of women within leadership positions, or the pursuit of identifying a necessary critical mass, this paper analyzes the performance effect of having a balanced gender distribution.

Gender diversity in boardrooms has increasingly drawn scholarly and policy-making attention (see, e.g., Adams *et al.*, 2015; Joecks *et al.*, 2013; Konrad *et al.*, 2008; Terjesen *et al.*, 2009). The debate was fueled in 2006 by the obligatory introduction of a 40 percent quota of female directors in Norwegian listed companies (the law took force in 2006 and businesses were given two years to adjust: in April 2008 the Norwegian government announced full compliance). Following the spirit of this law, other developed countries—e.g., Belgium, France, Iceland, Italy, the Netherlands and Spain—have enacted similar (softer) regulatory frameworks. Underlying most of these legislative initiatives is the premise that the presence of women on boards could affect the governance of companies in significant ways. Notwithstanding the increased relevance of gender diversity in the boardroom for managers and policy makers, the large literature dealing with the effects on performance of gender diversity in boards and top management teams offers decidedly mixed results (for a comprehensive review of the literature see, e.g., the recent surveys by Post and Byron (2015) and Jeong and Harrison (2017)).

[1] http://www.economist.com/news/business/21653626-claims-women-manage-differently-fromor-better-thanmen-are-questionable-sex-boardroom

In this context, existing research in the field mostly focuses on the relationship between women representation in boardrooms and business performance, where the direction and intensity of this effect can be heterogeneous and industry specific (Brammer *et al.*, 2009).

Existing empirical studies show that by broadening the range of experience and expertise available to a team, diversity can promote team effectiveness. Consistent with this argument, research has found that, compared to homogeneous management teams, diverse executive teams are more innovative and adopt richer strategies (Bantel and Jackson, 1989), respond better to competitive threats (Hambrick *et al.*, 1996), and are quicker to implement change (Adams and Funk, 2011). As opposed to a team diversity composed of 'specialists', a heterogeneous team composed of individuals with a greater breadth of experiences is found to have greater cognitive variety and to be better able to realizing the performance benefits linked to diversity (Adams and Ferreira, 2009). Gender diversity is a type of non-function specific diversity that is potentially conducive to such cognitive variety and to high performance management teams.

But women are unlikely to have much impact on corporate performance unless they become a notable proportion of the corporate hierarchy. Only as their numbers increase will women be able to influence their male colleagues to accept and approve the distinct perspectives and policies promoted by women (Childs and Krook, 2008). For the representation of women to truly have an impact over the policies and therefore the performance of an organization some have proposed that a 'critical mass' of women must participate in order to get the collective to behave differently from the typical group (Oliver *et al.*, 1985). However, the optimal proportion of women in the corporate upper echelon to maximize the performance of the firm has yet to be clearly identified.

This study seeks to gain a deeper understanding of gender diversity in boardrooms by examining how the presence of women on boards and in the corporate hierarchy of a firm—i.e., chairperson and CEO—impacts various performance dimensions. Specifically, this study evaluates the effects of gender diversity on economic and risk-oriented performance metrics, while accounting for certain organizational features that might affect both the depth of gender diversity and performance. This paper therefore analyzes the performance effect of having a balanced gender distribution (40% < proportion of women in the boardroom < 60%), instead of mere representation, or the pursuit of identifying a necessary critical mass.

The empirical application uses a rich dataset of Costa Rican banks during 2000-2012. This setting is attractive since it underwent important changes in the regulatory framework jointly with enhancements in monitoring practices. Moreover, the Costa Rican legislation does not impose 'gender quotas' that intervene in the gender composition of private boards, including those of financial institutions. The proposed analysis provides an opportunity to analyze how

gender diversity contributes to organizational performance in a context of increased women representation in boards where competitive conditions are complex and heterogeneous.

This study looks into the role of gender diversity in boardrooms on various performance metrics, answering the call by Adams and Ferreira (2009) for more research on the effects of women representation in the board in relatively unexplored industries, such as financial institutions. Furthermore, this study complements the literature dealing with the effects of women's representation in the upper level of management and performance in Latin American economies (see, e.g., Mullins, 2005; Flabbi *et al.*, 2017). By connecting two dimensions of gender diversity—i.e., board heterogeneity and leadership—and banking performance in an emerging market this study contribute to further interlock and enrich these two perspectives, which are critical to scholars and policy makers, and which are compatible with managerial decision-making processes.

More concretely, this paper questions the impact of mere representation of women and the critical mass arguments to the gender composition of corporate boards and argue that balanced gender diversity optimizes performance. The results of the study contribute to the debate on the role of gender balanced board diversity. Financial firms with such gender balance report superior economic performance. This is the case even in comparison to financial firms with female leadership.

The remainder of the document is structured as follows. Section 2 provides an overview of the literature on gender diversity in boards and in top management positions and performance. Section 3 presents an overview of the Costa Rican financial industry. Section 4 describes the data and methodology used in the study. Empirical results are found in Section 5, while Section 6 presents the discussion and concluding remarks.

2. Theoretical foundations and hypotheses formulation

This section elaborates on the literature dealing with gender diversity and organizational performance. The section first defines gender diversity according to the existing literature. Next, a review of empirical research regarding the two dimensions of gender diversity analyzed in this study is presented: female representation in boards and women in leadership positions.

Heterogeneity in boardrooms can be determined in different ways. Some papers propose a distinction between (1) demographic and (2) cognitive diversity (Erhardt *et al.*, 2003). Demographic aspects are observable attributes as age, race and ethnicity. Cognitive diversity is less observable and relates to knowledge, education, values, perceptions and personality characteristics. Another regularly used classification is (1) job-related and (2) non-job-related heterogeneity (Adams and Ferreira, 2009; Naranjo-Gil *et al.*, 2008). In this case non-job-related aspects are closely linked to demographic features. Gender diversity is part of the non-job-

related and demographic categorization. It is only one of the multiple aspects of diversity but one, such as ethnicity, which is ethically sensitive when it comes to the principle of equality of treatment. The pursuit of this equality treatment leads to the assumption of tokenism (Adams and Ferreira, 2009), and skepticism that gender diverse boards are a case for moral or social legitimacy thus not a valid economic argument (Chapple and Humphrey, 2014). Hence, it is necessary to deepen rational reasoning in order to overturn the glass ceiling, a phenomenon that keeps women (and other minorities) from reaching top ranks in firms (Adams *et al.*, 2015). This glass ceiling is best witnessed in the corporate hierarchy, with 18.7% of World Bank globally surveyed firms having female participation on their top management team (World Bank, 2014).

As the board of directors represents an influential entity over (1) the strategy and decision making-process, and (2) the monitoring/controlling of executives on behalf of the shareholders, the functioning of the board of directors is highly related to organizational performance (Adams and Ferreira, 2009). Therefore, it is relevant to investigate how gender representation affects this functioning, and subsequently the performance of the organization. Gender representation refers to the amount or proportion of women to men in the corporate hierarchy. Most research analyses the gender diversity/performance relationship in developed economies. Few studies do so in emerging markets (e.g., Mahadeo *et al.* (2012) in Mauritius; Liu *et al.* (2014) in China; Ararat *et al.* (2015) in Turkey; and Nguyen *et al.* (2015) in Vietnam) or, more concretely, in Latin American settings (e.g., Mullings (2005) for five Caribbean islands; and the extensive work by Flabbi *et al.* (2017) in 31 Latin American economies).

2.1 Dimension 1: Female board of directors' representation

There are numerous studies reporting no significant relation between gender diversity and performance. For example Erhardt *et al.* (2003) find a non-significant relationship between board diversity and performance (ROA and ROI); while Naranjo-Gil *et al.* (2008) show that non-job-related heterogeneity (e.g. gender diversity) is not associated to performance. Also, in their analysis of businesses listed on the FTSE350 during 1996-2011, Gregory-Smith *et al.* (2014) find no significant link between gender diversity and performance.

Some studies also report a negative impact of gender diversity on performance. Adams and Ferreira (2009) find that gender diversity negatively affects performance in firms with weaker defense (take-over) control mechanisms. Mateos de Cabo *et al.*, (2011) report a negative relationship between gender board diversity and performance in publicly traded companies.

Likewise there is an equal amount of studies revealing a positive relationship between women representation in boards and performance (Brammer *et al.*, 2009; Mahadeo *et al.*, 2012). Post and Byron (2015) conducted an exhaustive meta-analysis of 140 studies linking board

gender diversity and performance to conclude that no significant link, neither positive nor negative, exists between both variables.

Several studies explain this ambiguity in the results arguing that the relationship between women representation in boards and performance is non-linear (S- or U-shaped) (Ali *et al.*, 2014; Ararat *et al.*, 2015; Joecks *et al.*, 2013). Post and Byron (2015) recognized that a limitation of their meta-analysis was that it did not allow them to test non-linear relations between gender diversity and performance, which may explain the study's lack of significant results. Such non-linear relationship is in line with the critical mass theory by Kanter (1977). For a physicist, the 'critical mass' is the threshold of radioactive material that is needed for a nuclear fission explosion to occur. Social scientists have used the expression to refer to the minimum tipping point of participants required before a social phenomenon can take hold (Oliver *et al.*, 1985).

Kanter's (1977) theory of critical mass is one of the most used for the study of gender-diversity. Applied to diversity, Kanter's critical mass theory splits groups in four categories based on a dominant and minority sub-group: (1) uniform (0% minority), (2) skewed (up to 20% minority), (3) tilted (20 to 40% minority), and (4) balanced (40-60% balanced). The theory predicts that the effects of any minority group should start to be visible somewhere in the tilted ratio as tokenism disappears and minority members can ally to influence the group's culture. Although Kanter (1977) used the case of women employees to build her argument, her thesis proposed that the critical mass benefits of diversity applied for any workforce minority group within the firm (Childs and Krook, 2008). Contrary to what is often assumed, the 'benefits' of the critical mass theory originally had little to do with firm performance, but rather supposed a greater decision-making that would serve the particular benefit of members of the minority group (Kanter, 1977). Kanter did not empirically test her theory nor give any precision as to the exact proportion of any particular minority within a group that would constitute an effective critical mass. This theory has nevertheless been prominently used within the gender diversity literature linking diversity to performance.

Joecks *et al.* (2013, p. 70) determine, based on their research of 151 listed German firms, that: "a more gender diverse board composition will only enhance performance if diversity is sufficiently large… and that only for boards with a critical level…, performance will be over and above the one of male boards." Liu *et al.* (2014) uncover a similar pattern of critical mass in their study of gender diversity in a Chinese context.

In their research on the effects of female board members on firms' perceived reputation, Brammer *et al.* (2009) acknowledge that the presence of women on the board is favorably viewed in only those sectors that operate close to final consumers. For the financial services industry, although having 66% of female workforce in their UK-sample of 2004, Brammer *et al.*

(2009) find no effect regarding financial services industry. This is in line with Chapple and Humphrey (2014) who report that in some industries diversity is positively correlated with performance but that in the financial industry results are mixed. On contrary, García-Meca *et al.* (2015) find that banks with greater gender diversity achieve superior productivity. This reinforces Ali *et al.* (2014) results on the effects of gender diversity on labor productivity.

But when it comes to bank performance, results are not so clear (Ararat *et al.*, 2015; Liu *et al.*, 2014; Mahadeo *et al.*, 2012; Nguyen *et al.*, 2015). One of the reasons for this is that the proportion of women participation, or critical mass, is not homogeneous. This is in-fact a problem with the critical mass theory. Kanter (1977) left the necessary critical mass open for variance within a range that stretched anywhere from 20% to 40% of the total, where it is argued that the higher the proportion within the group the more the influence over social experiences (Childs and Krooks, 2008). Those studies that do seem to confirm the relationship between board gender diversity and bank performance are found to link very high proportions of women board participation, which from Kanter's perspective would have been categorized as 'Balanced'. Landel (2016) as well as several non-academic studies (Credit Suisse, 2016; World Economic Forum, 2016) are increasingly providing evidence that true performance improvements from board gender diversity come only with a balanced gender distribution within the upper corporate hierarchy of the organization. As Elizabeth May, Leader of the Canadian Green Party, once said of gender balance in government (May, 2015: 1) "50 per cent female cabinet appointments lead to 5000 per cent increase in guys who suddenly care about merit in cabinet". The same could be said of the corporate world. Therefore, more than tokenism or any range of critical mass, the following hypothesis is proposed:

H1: *Balanced gender board diversity leads to greater firm performance*

2.2 Dimension 2: Women in leadership positions

As mentioned in the introduction, gender effects on the performance of boards are often related to (1) female representation (ratios), or (2) to core differences in the behavior of men and women. This latter literature tries to determine differences in characteristics, traits and leadership styles. Some of these studies have suggested that women are more risk averse (Eckel and Grossman, 2008), better at monitoring (Adams and Ferreira, 2009) and more long-term oriented (Silverman, 2003). For banking services, Bellucci *et al.* (2010) find that female loan officers are more risk-averse and/or less self-confident than male officers. Bertrand and Hallock (2001) assume that such unobservable differences are minimized in the group of top executives since men and women are likely to share high level of job motivation and high career ambitions. Hence, the projection of these gender stereotypes is sometimes associated with the existence of the glass-ceiling (Mateos de Cabo *et al.*, 2011). Also Adams and Ferreira (2009) find 'group

effects' of female representation in board of directors—as critical mass theory—with individual effects of female in leadership position as Chairperson, CEO, or other executive roles.

This line of thinking flows out of some of the developments of the critical mass theory that came from the field of political science. Dahlerup (1988) suggested that the available empirical evidence simply did not support the relationship between a specific percentage of women and change. She suggested that change lay in 'critical acts', or initiatives of women (Child and Krook, 2008). Change as a result of the participation of women in the hierarchies of organizations depends on 'the willingness and ability' of women (Dahlerup, 1988, p. 296). This shifted the causation of outcomes from the notion of 'critical mass' to a one that depended much more on the actions of particular individuals in positions of leadership (Child and Krook, 2008).

Exploring women in top corporate leadership positions is therefore warranted. The impact of women in these specific roles is of much interest as their leadership style directly affects strategy, decision-making, the corporate culture and, ultimately, firm performance (Ravasi and Schultz, 2006). The study of Adams and Funk (2011) is one of the few that focuses solely on directors' characteristics. Their research supports the argument that gender differences matter; however, the methodology is based on a self-reported survey and was not intended to find differences in performance. In a recent study focused on women CEOs and Chairs in the U.S. banking industry, Palvia *et al.* (2015) observed that women CEOs hold more conservative capital levels, and that small banks with women CEOs and/or Chairs were less likely to fail.

However, empirical evidence from 147 different studies compiled by Jeong and Harrison (2017) does not support the view that women CEO can positively influence performance. It could be assumed that at these crucial leadership roles any tokenism disappears and hiring is solely performed on base of skills and abilities (Mateos de Cabo *et al.*, 2012). Wolfers (2006) confirms this argument by finding no effect of women CEOs on performance for S&P 500 firms over the period of 1992-2004. Adams and Funk (2011) suspect that industry- or country- level differences can be observed if CEO femininity is seen as a comparative advantage. Thus, when it comes to the impact of women over performance, evidence appears more heavily stacked on the side of adopting balanced gender distribution within the corporate hierarchy rather than the tokenism of 'critical acts' that may be carried out by women in top position of organizational leadership. Therefore, the prior hypothesis is reinforced as follows:

H2: *Firms with a gender-balanced board show superior performance, irrespective of whether a woman holds a leadership position in the top of the corporate hierarchy.*

3. The Costa Rican banking industry

Similar to other developing economies, the Costa Rican government promoted the deregulation of the banking industry seeking to improve monitoring activities as well as to

enhance competitiveness (IMF, 2013; Yildirim and Philippatos 2007). The Costa Rican banking industry has gone through various reforms. Among these reforms was the creation in 1995 of an independent supervisory agent linked to the Costa Rican Central Bank (Superintendent of Financial Entities, SUGEF). The function of this agency was to improve the transparency of financial firms. Another significant reform was the introduction of the CAMELS rating framework in 2001 to further enhance the monitoring of financial firms' activities (IMF, 2003; SUGEF, 2000). A detailed description of the entire deregulation process of the Costa Rican banking industry is presented in Epure and Lafuente (2015).

The SUGEF monitors all types of financial firms in the market, including: state-owned commercial banks, private banks, mutual banks, cooperative banks, financial conglomerates, financial (non-banking) firms, credit unions and currency exchange offices. Nevertheless, for the purposes of this paper, the analysis focuses on those banks that operate under the same market conditions, in terms of regulation: the state-owned commercial banks, private banks, mutual banks and cooperative banks.

There are various characteristics of the Costa Rican banking industry that are worth mentioning. First, the four types of financial firms analyzed in this study operate under the same regulatory regime. Financial laws have also introduced transparency mechanisms that facilitate the access to detailed information on financial operations and organizational architecture. Second, regulation restricts the composition of the board of directors, and all board members have to be outsiders; that is, directors cannot hold any position in the financial firm (CEO, top management team, middle managers, or any other position) (Epure and Lafuente, 2015).

Third, efforts of the Costa Rican administration to combat gender discrimination started in 1990 with the enactment of the Gender Equality Act (Ley de Promoción de la Igualdad Social de la Mujer No. 7142).'Gender quotas' were first legislated in 1996 by promoting a 40% quota of women across public levels of governance (local and national) and across political parties (Ley de Reforma del Código Electoral y Ley Orgánica de Tribunal Supremo de Elecciones No. 7653). Recently, further reforms have sought to promote similar 'gender quotas' (minimum 40%) in the boardroom of solidarity associations, civil organizations and labor unions (Ley de Porcentaje mínimo de mujeres que deben integrar las Directivas de Asociaciones, Sindicatos y Asociaciones Solidaristas No. 8901).

Despite these reforms, it is important to highlight that the Costa Rican legislation does not impose any 'gender quota' that artificially increases women's participation in boards and top management positions of private organizations, including financial firms.

In conclusion, the Costa Rican financial legislation promotes greater transparency, as well as the separation of decision rights by imposing both the nomination of fully outside boards and a two-tier leadership structure among financial firms. Nevertheless, decisions related

to the appointment of women in top positions of the corporate hierarchy (boardroom or top management team) continue to be entirely endogenous at the financial firm level.

4. Sample, variable definition and method

4.1 Sample

The data used in this study comes from the publicly available datasets of the Costa Rican Central Bank, and includes detailed accounting and organizational information for all financial firms in the industry during the period 2000-2012. As a result of a limited number of business entries—i.e., two private banks started operations in 2007 and 2010; and one cooperative bank was created in 2007—and exits—i.e., one mutual bank in 2005; five private banks in 2001, 2004, 2006, and 2012; and three cooperative banks in 2003 and 2009—reported during the period under analysis, the total number of financial institutions in Costa Rica changed from 48 in 2000 to 42 in 2012. Therefore, the study employs an unbalanced panel that encompasses all state-owned, private, mutual and cooperative banks that operate in the industry. The final sample includes information for 571 firm-year observations (2000= 48 cases; 2001-2002= 47 cases; 2003= 46 cases; 2004-2006= 42 cases; 2007-2011= 43 cases; 2012= 42 cases).

At this point, it should be noted that the state-owned banks are fully controlled by the Costa Rican government; however, and according to the regulatory framework, they are considered independent firms since politicians cannot influence their managerial decisions. In terms of market share, this group controlled 54 % of the deposits in 2012. The second group includes private commercial banks. In 2012, this group attracted 29 % of the deposits. The third group is formed by the mutual banks, which in 2012 had 7% of the deposits. Note that, similarly to the state-owned banks, the deposits of mutual banks are guaranteed by the government. The last group consists of cooperative banks. Although these financial firms are owned by their cooperative members, they offer financial services to any type of customer. In 2012 these firms accounted for 10% of the deposits.

4.2 Variable definition

Performance. This study uses three accounting metrics to capture the performance of financial firms. First, two variables are used to measure economic performance: the rate of return on assets (ROA) defined as the ratio of net profit divided by total assets; and the net intermediation margin (NIM), which is calculated as the difference between interest income and interest expense relative to total assets. Second, risk performance is measured via the non-performing loans ratio (NPL), expressed as the non-performing loans divided by total loans. Note that, following the regulation set by the SUGEF (SUGEF, 2000), non-performing loans are credit operations—i.e., mortgages, commercial loans or corporate loans—past due for at least

90 days. These performance variables have been used in prior research on bank performance (e.g., Banker *et al.*, 2010; Epure and Lafuente, 2015). Descriptive statistics for the study variables are presented in Table 1, while Table A1 in the Appendix shows the correlation matrix.

Gender diversity in the board. For each analyzed year, the database used in this study includes detailed information on the board of directors of Costa Rican financial firms, including names, date of appointment and contract termination date for all board members. The level of disaggregation in the data permits an in-depth analysis of the effect on performance of various measures of board's gender diversity. First, the study employs the ratio of women directors divided by the total number of directors to measure boards' gender diversity, that is, the women's representation in the boardroom. The rate of women directors constitutes the most widely used variable to analyze the effects of gender diversity on performance (see, e.g., Adams and Ferreira, 2009; Chappel and Humphrey, 2014). From Table 1 it can be seen that the sampled banks have, on average, 16.91% of women directors. Additionally, Figure 1 shows how the proportion of women on the board of Costa Rican financial firms has systematically increased between 2007 (proportion of women directors: 18.05%) and 2012 (proportion of women directors: 21.58%). Second, a dummy variable that takes the value of one if the proportion of women directors ranges between 40% and 60% is introduced, that is, the board has a gender balanced configuration (40% < women directors < 60%).

---- Insert Table 1 about here ----

---- Insert Figure 1 about here ----

Women's leadership in the corporate hierarchy. The study includes a dummy variable that takes the value of one if a woman chairs the board of directors. In addition, a dummy variable identifies if the top executive (CEO) of the analyzed financial firms is a woman.

Control variables. All model specifications control for bank size, board size, capital adequacy and time. Bank size is measured as total assets, expressed in millions of 2012 constant Costa Rican colones. Board size is defined as the total number of directors. Note that, in all regression models, the variables 'bank size' and 'board size' are logged to reduce skewness. The capital adequacy ratio (CAR) is computed as equity plus risk-weighted reserved divided by total assets. Finally, a set of time dummy variables is included to rule out the potential effect of time trends and changes in the economic conditions among the sample financial firms during the analyzed period. Note that, in all regression models, all time varying control variables are lagged one period to control for potential endogeneity problems.

4.3 Method

The study employs panel data techniques to estimate the model which emphasizes that bank performance is affected by various dimensions of the banks' gender diversity. Pooling repeated observations on the same unit of analysis violate the assumption of independence of observations, resulting in autocorrelation in the residuals. First-order autocorrelation occurs when the disturbances in one period are correlated with those in the previous period, resulting in incorrect variance estimates, rendering ordinary least squares (OLS) estimates inefficient and biased (Wooldridge, 2002). Therefore, coefficients are estimated via fixed-effects panel data models with robust standard errors to correct for autocorrelation of disturbances due to constant firm-specific effects (Greene, 2003).

To evaluate the role of the analyzed gender diversity factors empirically, a baseline model estimates the performance of financial firms as a function of the gender diversity of the board and the gender of members of the corporate hierarchy (CEO/Chair). More formally,

$$\begin{aligned}\text{Performance (ROA, NIM, bad loan ratio)}_{it} &= \beta_0 + \beta_1 \text{Gender diversity}_{it-1} + \beta_2 \text{Women leadership}_{it-1} \\ &+ \beta_3 \text{Controls}_{it-1} + \beta_4 \text{Time}_t + \eta_i + \varepsilon_{it}\end{aligned} \quad (1)$$

In equation (1) β_j are parameter estimates for the *jth* independent variable, η is the time-invariant business-specific effect that controls for unobserved heterogeneity across financial firms (*i*) and that is uncorrelated with parameter estimates; and ε is the normally distributed error term that varies cross-observations and cross-time (*t*). The variable 'gender diversity' refers to the proportion of women directors, while three dummy variables are used to measure 'women leadership': a dummy taking the value of one if a woman is the CEO, a dummy taking the value of one if a woman is the Chair, and a dummy variable equal to one if a woman is the CEO or the Chair. Control variables include bank size measured as the log of total assets, board size expressed as the log value of the number of directors, and the capital adequacy ratio that controls for risk management. The variable 'Time' refers to the set of time dummy variables. All time-varying variables are lagged one period to avoid potential endogeneity problems.

Next, a full model incorporating the interaction term between the variables linked to the gender balanced board and women leadership is proposed. This model has the following form:

$$\begin{aligned}\text{Performance (ROA, NIM, bad loan ratio)}_{it} &= \beta_0 + \beta_1 \text{Gender balanced board}_{it-1} + \beta_2 \text{Women leadership}_{it-1} \\ &+ \beta_{12} \text{Gender balanced board}_{it-1} \times \text{Women leadership}_{it-1} \\ &+ \beta_3 \text{Controls}_{it-1} + \beta_4 \text{Time}_t + \eta_i + \varepsilon_{it}\end{aligned} \quad (2)$$

In equation (2), the variable 'gender balanced board' takes the value of one if the proportion of women on the board is between 40% and 60%, and the variable 'women leadership' is a dummy taking the value of one if a woman is the CEO or the Chairperson.

In terms of our hypotheses, a result of $\beta_1 > 0$ for the 'gender balanced board' variable (equation (2)) will corroborate that a balanced gender configuration outperforms structures with lower proportions of women directors (**H1**). Also, the second hypothesis (**H2**) that states that firms with a gender-balanced board show superior performance levels, irrespective of whether a woman holds a leadership position in the top of the corporate hierarchy will be confirmed if $\beta_1 > 0$ and $\beta_{12} = 0$ (equation (2)).

5. Results

5.1 Gender diversity and performance in financial firms

The results of the study are presented in Table 2 where three different dependent performance variables are modeled: Return of Assets (ROA), Net intermediation margin (NIM), and the bank's bad loan ratio. For each of the three dependent variables, two different specifications were calculated. The first model specification includes the rate of women board participation; the presence of chairwomen-led boards; and women CEO-led management teams, together with the mentioned control variables that profile the banking institutions observed. The second specification distinguishes banks with gender-balanced boards and those with women-leadership (combining banks with women-led boards with those with women-led management teams). The full model (specification 3) incorporates the interaction term between the variables linked to the gender balanced board and women leadership

It can be observed how fluctuations in the proportion of women within the boards of Costa Rican banks do not have any significant influence over any of the three performance variables being analyzed. Therefore, confirming arguments contrary to tokenistic representation of women in board, the linear relationship between board gender diversity and performance is not significant.

---- Insert Table 2 about here ----

However, a gender-balanced board is found to have a positive significant impact over the economic performance of Costa Rican financial firms (ROA and NIM). This relation was not found to be significant when bad loan ratio is the dependent variable. These results confirm the study's hypothesis (**H1**) that states that a gender-balanced board leads to greater firm performance: at least when it comes to ROA or the intermediation margin.

In the case of the importance of women leadership for firm performance, the results of the study show that Costa Rican financial firms with women-led boards or with women-led management teams (CEO) realize lower bad loan ratios. However, these women-led financial firms do not benefit from any significant difference in their ROA or NIM performance level. This would therefore lend to the acknowledgement that the 'critical acts' of women in the corporate hierarchy of Costa Rican financial firms does influence performance, but only when this performance is interpreted through the banks' risk management. Additionally, the result in model 3 of Table 2 shows that the coefficient linked to a gender-balanced board is statistically significant, while the interaction term between the 'gender-balance board' variable and the 'women leadership' variable is not significant. Therefore, the results confirm the model's second hypothesis (**H2**) that even in the absence of women leadership, a balanced gender board leads to greater firm performance. But as was the case for the interpretation of the previous hypothesis **H1**, this is only the case for economic performance (ROA and NIM). The opposite is true when measuring performance through the lens of a financial firms' bad loan ration.

5.2 Robustness checks

This sub-section presents the results of a number of robustness checks evaluating the linearity of the gender diversity-performance relationship, the suitability of the proposed gender diversity variables compared to alternative metrics, and the potential endogeneity of gender diversity among the study financial institutions.

Linearity in the relationship between gender diversity and performance.—First, we considered the possibility that the relationship between board's gender diversity and performance is non-linear. To verify this, the quadratic term of the proportion of women directors was added to equation (1). Results—presented in Table A2 of the Appendix—for the linear and squared term of the proportion of women directors are not significant. For the three analyzed performance variables, this result reinforces the proposed analysis of the relationship between the proportion of women directors and performance (Table 2).

Alternatives measures of gender diversity.—The second robustness check tests for the potential effect on performance of alternative gender configurations of boards, in terms of the proportion of women directors. In this case, and similar to Joecks et al. (2013), four spline variables are introduced to account for different levels of gender diversity in the board: fully-

men controlled (0% women directors), skewed (<20% of women directors), tilted (20% < women directors <40%) and balanced (40% < women directors < 60%). By introducing the spline variables in equation (1), the model can evaluate the effect of independent segments of an interval variable, in our case the rate of women directors (Greene, 2003). Table A3 in the Appendix shows descriptive statistics for the board's gender distribution among the analyzed financial firms, according to the abovementioned categories. The findings of the analysis (Table A4 in the Appendix) reveal that gender board diversity and performance are in-fact only positively related in the case of 'balanced' (40%-60%) gender distribution within the observed boards. The link between gender diversity and performance is not found to be significant in the case of skewed (<20%) or tilted (20%-40%) levels of board diversity (Kanter, 1977). This goes to show that it is in fact a balanced board, rather than any proportion indicating a particular critical mass of women board participation, what matters for superior economic performance (ROA and NIM) of Costa Rican financial firms.

Endogeneity of gender diversity.—Our empirical strategy (equations (1) and (2)) addresses endogeneity concerns related to reverse causality (first endogeneity problem) by lagging one period all explanatory variables. But, our models do not account for the potential endogeneity of boards' gender configuration (second endogeneity problem). In this discussion, literature rooted in the management and corporate governance frames emphasize that the boards' gender diversity—in our case, the proportion of women in the board and a balanced gender configuration—can be explained by the presence of a Chairwoman (see, e.g., Smith and Parrotta, 2018; Terjesen *et al.*, 2009). Underlying this 'women-led' hypothesis is the assumption that the (unintended) social mechanisms driving 'gender stereotypes' condition firms' behavior, and that the low presence of women in boards is the statistical manifestation of this male-led stereotyping effect (Kanter, 1977). In this sense, Ruigrok *et al.* (2006), Kaczmarek *et al.* (2012) and Smith and Parrotta (2018) argue that the presence of a woman as Chairperson may alleviate such stereotyped views of the profile of board members and, in turn, may increase the presence of women in boardrooms. This argument is in line with Adams and Ferreira (2009) and Huse *et al.* (2009) who stress that, besides having women in the board, women should have the capacity to influence decision making for gender diversity to affect the functioning of the board.

The econometric problem caused by the endogeneity of the predictor variables linked to boards' gender configuration may have relevant implications for our study. The selection of appropriate instruments is a hard task (Wooldridge, 2002); however, the theory presented above offers solid arguments to argue that the presence of a Chairwoman is a valid instrument for boards' gender configuration. Therefore, by testing the women-led hypothesis (Kanter, 1977) the last robustness check deals with the potential endogeneity of boards' gender configuration.

The estimated two-stage least squares (2SLS) model has the following form:

$$\begin{aligned}\text{Performance (ROA, NIM, bad loan ratio)}_{it} &= \beta_0 + \beta_1 \text{Board's gender configuration}_{it-1} + \beta_2 \text{Controls}_{it-1} \\ &\quad + \beta_3 \text{Time}_t + \eta_i + \varepsilon_{it}\end{aligned} \tag{3.1}$$

$$\text{Board's gender configuration}_{it-1} = \gamma_0 + \gamma_1 \text{Chairwoman}_{it-2} + \gamma_2 \text{Controls}_{it-1} + \gamma_3 \text{Time}_t + \mu_i + \nu_{it} \tag{3.2}$$

In equations (3.1) and (3.2), we use two variables to measure the 'board's gender configuration': the rate of women on the board and a dummy equal to one if the proportion of women on the board is between 40% and 60% (gender balanced board), Note that, in order to avoid 'double-counting' and collinearity problems, we re-computed the variables related to the board's gender configuration by excluding the Chairperson from the calculation.

The variable 'Chairwoman' is a dummy taking the value of one if a woman is the Chairperson. The set of control variables are the same used in equations (1) and (2). To control for the first endogeneity problem (reverse causality) all time-varying variables in equation (3.1) are lagged one period, while the instrument 'Chairwoman' in equation (3.2) is lagged 2 periods.

Concerning the computation approach, we use a standard 2SLS procedure to estimate equations (3.1) and (3.2) when the dependent variable is the rate of women in the board. For the 'gender-balanced' dummy, we follow the approach proposed by Wooldridge (2002, p. 623-624): we first obtained the fitted probabilities for the 'gender-balanced' variable (**Z**) by running a probit model using as predictor the 'Chairwoman' variable; second, we estimated equations (3.1) and (3.2) by 2SLS using as instrument the fitted probabilities (**Z**) in equation (3.2).

The results of the 2SLS models are presented in Table A5 of the Appendix. In line with Ruigrok *et al.* (2006) and Kaczmarek *et al.* (2012), the findings confirm that 'women-led' banks (i.e., with a woman serving as Chairperson) have a higher rate of women in the boardroom and are more likely to have a gender-balanced board. Additionally, although the significance of parameter estimates is weaker, the effects reported in Panel A are consistent with the results in Table 2: a gender-balanced board is conducive to performance (ROA and NIM).

The objective of this supplementary test was to show that our empirical results constitute a robust analysis of the relationship between gender diversity and banks' performance. The core findings of this exercise further validate the interpretations in the regression models presented above in sub-section 5.1 (Table 2).

6. Discussion and concluding remarks

This study proposes that a balanced gender configuration of the board of directors explains the effect of boards' gender diversity on performance. Furthermore, it is argued that the

positive performance repercussions of a balanced gender configuration within boards are not conditioned by the presence of women leadership in the corporate hierarchy (Chair or CEO). The proposed approach offers a compelling vision of the gender diversity-performance relationship that goes beyond the mere representation of women within the corporate hierarchy, or the pursuit of identifying a necessary critical mass, and focuses on the performance effect of having a balanced gender distribution within the board of directors.

This study provides further evidence that contributes to understand how the gender configuration of the board is connected to organizational performance. Organizations do not realize the generally positive effects of greater levels of board diversity at the same intensity. Overall, the findings are consistent with our argument that emphasizes that, unlike a proportion indicating a particular critical mass of women on the board, a balanced gender configuration yields to superior economic performance. Additionally, results reveal that the positive effect of a gender-balanced board on performance is not conditioned by the presence of a woman in the top of the corporate hierarchy (Chair or CEO).

This paper has important implication for scholars and policy makers. From an academic perspective, prior research has emphasized the role of a critical mass of women on the board to materialize the potentially positive effects of a more diverse board (e.g., Konrad *et al.*, 2008; Torchia *et al.*, 2011; Joercks *et al.*, 2013). The results not only constitute a clear case against tokenism on boards, but also reveal that superior economic performance is achieved primarily by firms with a gender-balanced board. Additionally, the evidence suggests the presence of different risk management practices in gender balanced boards, which supports prior findings suggesting that women have different risk perceptions that influence their managerial decision-making (Eckel and Grossman, 2008; Bellucci *et al.*, 2010). By analyzing the relationship between gender diversity and performance in a non-regulated context, this study contributes to the growing literature on the performance effects of gender diversity in emerging markets (Ararat *et al.*, 2015; Nguyen *et al.*, 2015; Liu *et al.*, 2014; Mahadeo *et al.*, 2012) and, more specifically, in Latin American contexts (Flabbi *et al.*, 2017; Mullings, 2005).

For policy makers, the results of the study give support to a growing number of regulations calling for balanced gender distribution of corporate boards. Beyond the ethical and moral arguments motivating such regulations, the study's findings add economic arguments to this type of legislation. But, the debate is open, and caution should be advised as the results of the study do not allow us to extrapolate that superior economic performance of firms with a gender-balanced board will be maintained following the enactment of 'gender balance' legislations. Our results indicate that a gender balanced board translates in superior economic performance. Because of the potentially enriching effects of a diverse board (Adams *et al.*, 2015; Brammer *et al.*, 2009), investors need to turn their attention to the benefits of more

diverse boards, in terms of increased knowledge stock, and open the door for promoting the inclusion of a greater number of women on boards.

A series of limitations to the present study that, in turn, represent avenues for future research should be mentioned. First, like other studies on gender diversity (see, e.g., Joecks *et al.*, 2013; Torchia *et al.*, 2011), the data do not permit the direct analysis of the underlying decision-making process within financial firms. The study presents various interpretations of how gender diversity impacts performance; however, we do not evaluate how organizations select and recruit new board members (men and women), nor do we assess the processes through which boards and top executives implement new strategies and how these actions impact performance. Further research on these issues would be valuable. For example, future studies should evaluate whether the effect of gender diversity on performance is related to the experience—i.e., tenure—and the specific human capital level of board members and top executives. Second, specifically designed future research should analyze if the recruitment process of women directors and top executives is subject to different rules, compared to those applied to men candidates.

Finally, the findings in this study are based on the longitudinal analysis of Costa Rican financial institutions. Obviously, we cannot establish that the findings are generalizable to all financial institutions, or whether they generalize to businesses operating in other industries or settings. The sampled financial institutions may have idiosyncratic characteristics that impacted both their patterns of performance and the composition of their boards. Therefore, the results presented in this study are open to future verification. In this sense, future work should evaluate our arguments on the relevance of a gender balanced board—instead of tokenism in boards—for enhanced performance in financial and non-financial businesses using data for a wider array of industries operating in different geographic contexts.

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List of Tables

Table 1. Descriptive statistics for the selected variables

	Mean	Standard deviation	Q1	Q3
ROA	0.0202	0.0265	0.0094	0.0258
Net intermediation margin	0.0648	0.0315	0.0424	0.0803
Bad loan ratio	0.0166	0.0318	0.0056	0.0205
Proportion of women directors	0.1691	0.1641	0.0000	0.2857
Proportion of men controlled boards (100%)	0.3485	0.4769	0.0000	1.0000
Proportion of skewed boards (<=20%)	0.2417	0.4285	0.0000	0.0000
Proportion of tilted boards (21%-40%)	0.3012	0.4592	0.0000	1.0000
Proportion of balanced boards (41%-60%)	0.1086	0.3114	0.0000	0.0000
Woman as chairperson	0.0385	0.1926	0.0000	0.0000
Woman as CEO	0.1103	0.3136	0.0000	0.0000
Bank size (total assets)	241413.30	587990.20	5919.26	178366.80
Board size (number of directors)	7.5604	1.4257	7.0000	9.0000
Capital adequacy ([equity + risk-weighted reserved] / total assets)	0.2213	0.1475	0.1162	0.2838

Monetary values (total assets) are expressed in millions of 2012 Costa Rican Colones, and are deflated with respect to inflation. Sample size: 571 firm-year observations.

Table 2. Fixed-effects regression results: Gender diversity and performance

	Return on assets (ROA)			Net intermediation margin (NIM)			Bad loan ratio		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Rate of women in the board	0.0031 (0.0084)			0.0051 (0.0074)			–0.0042 (0.0088)		
Chairwoman	–0.0066 (0.0042)			–0.0055 (0.0038)			–0.0034* (0.0019)		
Woman as CEO	–0.0011 (0.0077)			–0.0038 (0.0034)			–0.0082** (0.0037)		
Gender balanced board		0.0043* (0.0025)	0.0061* (0.0033)		0.0062** (0.0028)	0.0075** (0.0036)		0.0002 (0.0026)	0.0001 (0.0030)
Woman leadership (Chair or CEO)		–0.0035 (0.0028)	–0.0008 (0.0055)		–0.0045 (0.0039)	–0.0025 (0.0041)		–0.0062*** (0.0023)	–0.0064** (0.0030)
Gender balanced board X Woman leadership			–0.0153 (0.0092)			–0.0114 (0.0079)			0.0014 (0.0061)
Bank size (log value)	–0.0060** (0.0029)	–0.0062** (0.0029)	–0.0057** (0.0028)	–0.0030 (0.0046)	–0.0031 (0.0045)	–0.0028 (0.0045)	–0.0048 (0.0083)	–0.0049 (0.0084)	–0.0049 (0.0085)
Board size (log value)	–0.0001 (0.0009)	0.0001 (0.0009)	0.0001 (0.0013)	–0.0002 (0.0012)	–0.0002 (0.0012)	–0.0003 (0.0012)	0.0023 (0.0025)	0.0022 (0.0025)	0.0022 (0.0025)
Capital adequacy ratio	0.0858*** (0.0130)	0.0864*** (0.0129)	0.0860*** (0.0247)	0.0959*** (0.0298)	0.0972*** (0.0297)	0.0969*** (0.0296)	–0.0041 (0.0127)	–0.0038 (0.0126)	–0.0037 (0.0126)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	0.1610** (0.0734)	0.1627** (0.0728)	0.1556** (0.0709)	0.0945 (0.0839)	0.0952 (0.0825)	0.0899 (0.0820)	0.0870 (0.1370)	0.0875 (0.1376)	0.0875 (0.1376)
F test	10.56***	13.10***	15.74***	8.49***	10.43***	11.32***	2.64***	2.76***	2.68***
R2 (within)	0.3837	0.3849	0.3910	0.3328	0.3393	0.3438	0.0222	0.0217	0.0217
Observations	516	516	516	516	516	516	516	516	516

All independent variables are lagged one period to avoid endogeneity problems. Robust standard errors are presented in brackets. *, **, *** indicate significance at the 10%, 5% and 1%, respectively.

Appendix

Table A1. Correlation matrix

		1	2	3	4	5	6	7	8	9	10
1	Return on assets	1									
2	Net interest margin	0.5592***	1								
3	Bad loan ratio	-0.6434***	-0.0202	1							
4	Capital adequacy ratio	0.5291***	0.8058***	-0.0554	1						
5	Women in the board	0.1873***	0.3688***	-0.0409	0.4096***	1					
6	Gender diverse board	0.0751*	0.206***	-0.0466	0.2534***	0.6622***	1				
7	Chairwoman	-0.0293	-0.0892**	-0.0120	-0.0462	0.2493***	0.1707***	1			
8	Female CEO	0.0142	-0.0025	-0.0111	-0.0531	-0.1838***	-0.1001**	-0.0705*	1		
9	Female Chair and/or CEO	-0.0033	-0.0504	-0.0162	-0.0717*	-0.0270	0.0042	0.4787***	0.8421***	1	
10	Total assets (ln)	-0.2101***	-0.4809***	0.0130	-0.5703***	-0.4103***	-0.2933***	-0.0333	0.0140	-0.0057	1
11	Board size	0.0894**	-0.0151	-0.0742*	0.0891**	0.1645***	-0.0457	0.1065**	-0.1307***	-0.0575	0.0588

*, **, *** indicate significance at the 10%, 5% and 1%, respectively.

Table A2. Fixed-effects regression results: Non-linear relationship between the proportion of women directors and performance

	Return on assets (ROA)		Net intermediation margin		Bad loan ratio	
	(1)	(2)	(1)	(2)	(1)	(2)
Rate of women in the board	0.0031 (0.0084)	–0.0034 (0.0151)	0.0051 (0.0074)	–0.0193 (0.0159)	–0.0042 (0.0088)	–0.0008 (0.0206)
Rate of women in the board (squared term)		0.0119 (0.0182)		0.0447 (0.0248)		–0.0062 (0.0255)
Chairwoman	–0.0066 (0.0042)	–0.0066 (0.0046)	–0.0055 (0.0038)	–0.0055 (0.0048)	–0.0034* (0.0019)	–0.0034 (0.0022)
Woman as CEO	–0.0011 (0.0077)	–0.0012 (0.0078)	–0.0038 (0.0034)	–0.0043 (0.0053)	–0.0082** (0.0037)	–0.0081** (0.0037)
Bank size (log value)	–0.0060** (0.0029)	–0.0061** (0.0030)	–0.0030 (0.0046)	–0.0033 (0.0044)	–0.0048 (0.0083)	–0.0048 (0.0084)
Board size (log value)	–0.0001 (0.0009)	0.0001 (0.0013)	–0.0002 (0.0012)	–0.0001 (0.0012)	0.0023 (0.0025)	0.0023 (0.0025)
Capital adequacy ratio	0.0858*** (0.0130)	0.0861*** (0.0250)	0.0959*** (0.0298)	0.0970*** (0.0292)	–0.0041 (0.0127)	0.0863 (0.1374)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	0.1610** (0.0734)	0.1624** (0.0729)	0.0945 (0.0839)	0.0996 (0.0814)	0.0870 (0.1370)	0.0875 (0.1376)
F test	10.56***	10.88***	8.49***	9.66***	2.64***	2.47***
R2 (within)	0.3837	0.3839	0.3328	0.3369	0.0222	0.0222
Observations	516	516	516	516	516	516

All independent variables are lagged one period to avoid endogeneity problems. Robust standard errors are presented in brackets. *, **, *** indicate significance at the 10%, 5% and 1%, respectively.

Table A3. Gender diversity in the board of directors

	Uniform (men controlled board)	Skewed (0% < women < 20%)	Tilted (20% < women < 40%)	Balanced (40% < women < 60%)
2000	0.4375 (0.5013)	0.2500 (0.4376)	0.2500 (0.4376)	0.0625 (0.2446)
2001	0.4681 (0.5044)	0.1915 (0.3977)	0.2340 (0.4280)	0.1064 (0.3117)
2002	0.3191 (0.4712)	0.2979 (0.4623)	0.3191 (0.4712)	0.0638 (0.2471)
2003	0.3478 (0.4815)	0.2391 (0.4313)	0.3261 (0.4740)	0.0870 (0.2849)
2004	0.4048 (0.4968)	0.2381 (0.4311)	0.2857 (0.4572)	0.0714 (0.2607)
2005	0.3571 (0.4850)	0.2619 (0.4450)	0.3095 (0.4679)	0.0714 (0.2607)
2006	0.3571 (0.4850)	0.2619 (0.4450)	0.3095 (0.4679)	0.0714 (0.2607)
2007	0.3256 (0.4741)	0.2791 (0.4539)	0.2326 (0.4275)	0.1628 (0.3735)
2008	0.3256 (0.4741)	0.2326 (0.4275)	0.3023 (0.4647)	0.1395 (0.3506)
2009	0.3256 (0.4741)	0.2326 (0.4275)	0.3256 (0.4741)	0.1163 (0.3244)
2010	0.3023 (0.4647)	0.2326 (0.4275)	0.3023 (0.4647)	0.1628 (0.3735)
2011	0.2791 (0.4539)	0.2093 (0.4116)	0.3953 (0.4947)	0.1163 (0.3244)
2012	0.2619 (0.4450)	0.2143 (0.4153)	0.3333 (0.4771)	0.1905 (0.3974)
Total	0.3485 (0.4769)	0.2417 (0.4285)	0.3012 (0.4592)	0.1086 (0.3114)

Standard deviation is presented in brackets.

Table A4. Fixed-effects regression results: The effect of different levels of gender diversity and performance

	Return on assets (ROA)	Net intermediation margin	Bad loan ratio
Men controlled board (100%)	–0.0019 (0.0111)	–0.0082 (0.0128)	0.0030 (0.0127)
Skewed board (<20%)	–0.0284 (0.0465)	–0.0427 (0.0411)	–0.0610 (0.0765)
Tilted board (20%-40%)	–0.0030 (0.0080)	0.0147 (0.0093)	0.0105 (0.0227)
Balanced board (40%-60%)	0.0182* (0.0098)	0.0273** (0.0136)	–0.0094 (0.0131)
Woman leadership (Chairperson or CEO)	–0.0036 (0.0052)	–0.0049 (0.0039)	–0.0058** (0.0023)
Bank size (log value)	–0.0059 (0.0040)	–0.0029 (0.0044)	–0.0041 (0.0086)
Board size (log value)	0.0001 (0.0013)	–0.0001 (0.0013)	0.0021 (0.0025)
Capital adequacy ratio	0.0856*** (0.0249)	0.0969*** (0.0289)	–0.0058 (0.0129)
Time dummies	Yes	Yes	Yes
Intercept	0.1617** (0.0735)	0.0952 (0.0825)	0.0856 (0.1365)
F test	10.81***	8.74***	2.36***
R2 (within)	0.3833	0.3386	0.0231
Observations	516	516	516

All independent variables are lagged one period to avoid endogeneity problems. Robust standard errors are presented in brackets. *, **, *** indicate significance at the 10%, 5% and 1%, respectively.

Table A5. Instrumental variable (IV-2SLS) estimates of the effect of boards' gender configuration on performance

	Return on assets (ROA)		Net intermediation margin		Bad loan ratio	
	(1)	(2)	(1)	(2)	(1)	(2)
Panel A: 2SLS estimates						
Rate of women in the board	0.0656 (0.2113)		0.1356 (0.1165)		0.0425 (0.0994)	
Gender balanced board		0.0773* (0.0453)		0.0495* (0.0294)		–0.0062 (0.0255)
Bank size (log value)	0.0030 (0.0075)	–0.0029* (0.0017)	–0.0035 (0.0030)	–0.0016 (0.0012)	–0.0059 (0.0093)	–0.0048 (0.0084)
Board size (log value)	–0.0009 (0.0013)	–0.0024* (0.0014)	–0.0007 (0.0009)	–0.0019* (0.0010)	0.0021 (0.0028)	0.0023 (0.0025)
Capital adequacy ratio	0.0690*** (0.0193)	0.1895*** (0.0253)	0.2012*** (0.0358)	0.1885*** (0.0181)	0.0015 (0.0157)	0.0863 (0.1374)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	–0.0604 (0.1053)	0.1103** (0.0396)	0.1086* (0.0648)	0.0689** (0.0285)	0.0977 (0.1480)	0.0875 (0.1376)
F test	4.12**	4.56***	4.92***	5.58***	3.02***	1.64*
R2 (within)	0.0624	0.0891	0.1337	0.2012	0.0178	0.0122
Panel B: First stage estimates						
Chairwoman	0.0625* (0.0368)	0.7915** (0.3472)	0.0625* (0.0368)	0.7915** (0.3472)	0.0625* (0.0368)	0.7915** (0.3472)
Intercept	0.5238*** (0.0786)	0.6059*** (0.2009)	0.5238*** (0.0786)	0.6059*** (0.2009)	0.5238*** (0.0786)	0.6059*** (0.2009)
F test	2.38**	5.43***	2.38**	5.43***	2.38**	5.43***
R2 (within)	0.0450	0.0743	0.0450	0.0743	0.0450	0.0743
Observations	516	516	516	516	516	516

Panel A presents the 2SLS estimates instrumenting boards' gender configuration—in our case, the proportion of women in the boardroom and the 'gender balanced board' dummy—with the presence of a Chairwoman (dummy variable). Note that, to avoid endogeneity problems, all independent variables in Panel A are lagged one period while the 'Chairwoman' dummy variable is lagged two periods in Panel B. Robust standard errors are presented in brackets. *, **, *** indicate significance at the 10%, 5% and 1%, respectively.