

WOMEN AS “GOLD DUST”: GENDER DIVERSITY IN TOP BOARDS AND PERFORMANCE FOR ITALIAN BANKS

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Abstract

Italian bank boards rarely include women, differently from what is observed in other sectors and countries. Using a unique dataset on Italian banks, this paper firstly analyses the main determinants of the female presence on top boards, with a particular emphasis on the role of past bank performance in terms of credit quality. Secondly, taking into account reverse causality problems, it investigates the effects of gender diversity on banking ex-post riskiness and economic performance. Our findings suggest that, on the one hand, past bank performance may significantly affect on the gender composition of the board. In particular, we find a higher presence of women in banks whose credit portfolio needed to be restructured. On the other hand, our evidence highlights a positive impact of gender diversity on the quality of credit and on profitability. Both results are likely to be driven by the higher risk aversion of women and by their attitude to monitoring and controlling activities. Our study therefore suggests that women are “gold dust” for Italian banks, and promoting their presence may be beneficial, especially in adverse economic conditions.

JEL Classification: G21, G34, J16.

Keywords: Banking, Corporate Governance, Gender Diversity, Board of Directors.

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1. Introduction¹

From the nineties onwards, regulatory and structural changes, stemming from privatization, consolidation and ICT improvement, increased the contestability of the banking industry. In spite of this “morphological revolution” the involvement of women in corporate governance still remains very limited in the banking sector. In the case of Italy the gender gap in banking is among the largest both in a European comparison concerning the presence of women in bank Boards of Directors, and in a national comparison across different economic sectors.²

The role of women in the economic activity, and more specifically in corporate governance, has become a topic of great interest and relevance, with the introduction of quotas in some European countries.³ In 2011, quotas have been introduced also in Italy for listed companies. Moreover, during the recent financial crisis many economists and researchers have questioned whether a greater participation of women as CEOs or on

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² With respect to the national comparison, see Bellavigna and Zavanella, 2010. According to BankScope data, in 2006 the percentage of women in bank Board of Directors in Italy (2.8 per cent) was the lowest in UE25 (except from Portugal with 1.9 per cent), against a mean European value of 7 per cent (Mateos de Cabo *et al.*, 2012).

³ Over the last decade, in many European countries national Authorities introduced a quota system, following what Norway did in 2003. Other countries adopted, instead, a “comply or explain” approach to companies’ adherence to recommendations on corporate governance codes.

Board of Directors would have been able to contain the excessive riskiness and leverage in the financial sector and to prevent important collapses.⁴ In this respect, there is a widespread awareness that financial turmoil can be to an important extent attributed to failures and weaknesses in corporate governance arrangements (Kirkpatrick, 2009).

So far, the literature on the impact of gender diversity on bank performance has provided mixed results. Most studies have highlighted the benefits originating from a greater involvement of women in bank boardrooms; however the evidence for its effects on bank performance is still ambiguous.

Using a unique Bank of Italy's archive on all bank board memberships combined with data on performance, riskiness and other balance sheet information from Supervisory Reports, the aim of this paper is twofold. First, using boardroom memberships combined with other bank-level features, our paper examines the main determinants of the probability that a woman holds a top-decisional position on bank boards and, at the same time, it analyses the correlations between women's involvement in corporate governance strategies and past bank performance, with a particular attention to the portfolio riskiness. In this respect, the analysis follows the branch of the literature which study the gender inequality in career perspectives, justified by a higher risk aversion in female behaviour, and it is the first study – to the best of our knowledge – to account how the gender gap is relevant for the top positions in the Italian banking sector. Second, using performance equations and tackling reverse causality, this paper investigates how female presence on bank boards may affect ex-post risk exposure and other economic outcomes. Once again, a lower portfolio riskiness may be in line with the evidence on women being more risk averse

⁴ In this regard, after the Lehman Brothers' collapse in September 2008, some economic newspapers argued: "What If Lehman Brothers had been Lehman Sisters?", see C. Lagarde, *The New York Times*, 11 May 2010; this point has also been made during the 2009 World Economic Forum.

than men and more inclined to monitoring and controlling activities. In this second respect, this paper is the first to provide empirical evidence of the effective impact of gender diversity on bank performance for Italian banks.

The rest of the paper is organized as follows. Section 2 summarizes the theoretical framework and the previous findings on gender diversity and firm or bank performance; Sections 3 describes data and variables. Some stylised facts are presented in Section 4. Section 5 shows the econometric strategy; Section 6 discusses empirical results on the main determinants of female presence in top boards, while Section 7 presents results on the effects of gender diversity on economic performance. Finally, Section 8 concludes and highlights some further lines of research.

2. Main empirical evidence from related literature

The financial crisis has increased the interest on bank governance issues, as it is confirmed by the new Principles released in 2010 by the Basel Committee on Banking Supervision. The economic literature focusing on the composition of the Boards of Directors and Supervisory Boards and on the relation between governance and performance is still scarce but growing. Among the causes of governance failure in financial institutions over the recent years, it has been suggested that the lack of gender diversity may reduce the availability of different experience, knowledge and points of views that can be particularly valuable to face critical situations.

The literature related to this paper can be divided into two groups and their main findings are summarised in Table 1. The first deals with the determinants of women's participation in corporate boards, to investigate the causes of gender inequality, while the second relates to the impact of an increase in gender diversity on firm's performance, to

assess whether it can enhance efficiency and risk control. Most empirical evidence concerns non-financial firms and not-regulated economic activities.

As for the determinants of the female presence on boards, the literature on non-financial firms generally finds a positive correlation between women's participation and board size, which may be interpreted as a signal of "preference for homogeneity" (Adams and Ferreira, 2009; Bianco *et al.*, 2013): large boards may indicate that the CEO is open to different opinions and therefore is not worried by gender diversity. This literature usually discusses the presence of "tokenism" (Kanter, 1977), whereas female representation is limited to one or only a few members, who are not given real power. A positive relationship between gender diversity and the size of the board tends to exclude tokenism, since it reveals that once a woman is appointed, the incentive to designate others does not disappear.

As for the impact of gender diversity on firm's performance, the literature has not reached a conclusive answer. Some authors have found a positive correlation between a larger presence of women on boards and the shareholder value (Carter *et al.*, 2003), and profitability. Others have shown either no impact or a negative correlation between gender and performance (Shrader, Blackburn and Iles, 1997; Adams and Ferreira, 2009). Adams and Ferreira (2009), in particular, find that women are more frequent on audit committees, highlight a positive correlation between the presence of women on boards and board attendance and find that, in general, more diverse boards devote more attention to monitoring activities. According to the authors, this attitude can be at the root of the negative impact of diversity on performance for non-financial firms when it leads to over-monitoring.

Focusing on Italian evidence, some studies investigate the relationship between the presence of women on top boards and governance for listed companies. Bianco *et al.*

(2013) do not find an effect on attendance but do confirm a positive impact on the number of meetings. For a slightly different period and a different sample of listed firms, Schwizer, Soana and Cucinelli (2012) show a positive relation between female presence in Boards of Directors and monitoring activity and, considering auditing boards, a positive correlation between female presence and the frequency of meetings.

As mentioned, the literature on banking boards' composition in a gender perspective is more recent and still limited, particularly with respect to European countries. The interest in focusing on the banking system is however high since its nature of regulated sector does not necessarily allow extending to it the conclusions drawn for other economic activities (Adams and Mehran, 2003). Studying a sample of EU banks, Mateos de Cabo *et al.* (2012) find evidence of “preference for homogeneity” but not for tokenism, detecting a positive correlation between gender diversity (measured by the *share* of women on boards) and board size. Using a three-year panel of European listed banks, Foti (2011) finds that women are more represented on larger and younger bank boards, with a larger share of independent male members, and in family-owned banks. The latter result is a further confirmation of the mentioned homogeneity approach, since it reveals the willingness by the family ownership of maintaining the core control of the bank.

Turning to gender and performance in the banking sector, Mateos de Cabo *et al.* (2012) find evidence for European banks of a positive correlation between higher share of women on boards and bank capitalization and a negative correlation with performance volatility (measured by the standard deviation of ROA). Better performance when women are more present can be linked to their mentioned higher attitude towards monitoring activity. This is consistent with the findings by de Andres and Vallelado (2008), who investigate the role of the size of the Board of Directors in bank performance, even though they do not explicitly consider gender diversity. The authors detect a positive effect of larger boards

and, in particular, of increasing the proportion of “outsider” members since this enhance monitoring and advisory activity, thus improving governance and, through this, shareholder value. However they also find an upper limit to this positive effect, detecting a maximum number of members above which coordination and control problems overweigh the benefit from the larger (and, implicitly, more diverse) boards.

A negative correlation between women’s participation in boardrooms and bank riskiness is found in Gulamhussen and Fonte Santa (2009), who consider a cross-section of data concerning large banks from OECD countries. Riskiness is approximated by loss reserves, loan loss provision and impaired loan ratio, and results are confirmed when they control for reverse causality. However, Berger *et al.* (2012), using difference-in-difference techniques to tackle endogeneity problems, found that younger executive teams in German banks increase risk-taking as do board changes that lead to a higher proportion of female executives.

A negative correlation between the number of women on boards and risk is consistent with the empirical literature suggesting that women are more risk-averse than men. Most of this literature is based on experimental data (see Croson and Gneezy, 2009, for a survey), which also detect some exceptions: differences in risk preferences by gender tend to disappear for corporate managers, due to either selection or adaptive behaviour. Considering non-financial firms, Guiso and Rustichini (2011), on a sample of Italian small and medium entrepreneurs, and Adams and Funk (2011), on a survey on Swedish directors of public-traded firms, find that female directors may even be more risk-prone than their male counterparts. More recently, Adams *et al.* (2012), using data on mandatory announcements of new directors appointments for publicly traded firms in Australia, argue that the gender of directors is value-relevant and that shareholders value the addition of female directors more relevant than that of male directors.

Finally, related to the literature on different attitudes towards risks by gender, some papers analyse the relevance of gender in bank-firm relationship. Beck *et al.* (2009) find that loans granted by female officers tend to present a lower probability of default than those allowed by their male colleagues. Since this result does not depend on different ability or experience, the difference may arise because of women's higher monitoring effort and/or capability. Bellucci *et al.* (2010) state that female loan officers tend to grant less credit to new and unestablished borrowers, as compared to their male colleagues, consistently with their higher risk aversion.

European comparisons show that Italy is among the EU countries where women are least represented in banking boardrooms. However, to our knowledge, the evidence on the Italian banking case is still scarce. Tarantola and Magliocco (2007) and ABI (2011) provide evidence on the presence of women in the banking sectors: in particular they both highlight the very few women in top-decisional memberships, while, at the same time, there has been an increasing number of women in lower hierarchical levels over the last decade. Del Prete and Stefani (2013) show some preliminary results on correlations between female presence in bank top boards and past bank performance. Focusing on bank governance and credit risk-taking, Benvenuti, Gallo and Kim (2013) find that gender diversity, among other factors, helped reducing ex-post risk for Italian banks in the financial crisis. The following analysis will try to shed further light on this issue.

Table 1

Author(s)	Countries	Period	Type of firms	Main findings
Adams and Ferreira (2009)	US	1996-2003	Non financial firms	Positive correlation between women presence on boards and attendance; women are more like to join monitoring committees. The effect of gender diversity on performance in on average negative.
Adams and Funk (2011)	Sweden	2005	Listed firms	Female directors are more risk averse than their male counterparts
Adams and Mehran (2003)	US	1986-1996	Banks and other firms	Bank Holding Companies present corporate governance characters that are different from those of other industries
Adams, Grey and Nowland (2012)	Australia		Listed firms	The addition of a new female board member increases shareholder value more than the addition of a male one
Beck, Behr and Güttler (2010)	Albania	1996-2006	Banks	Loans monitored by female bank officers display lower probability of turning problematic due to higher female monitoring capabilities
Bellucci, Borisov and Zazzaro (2010)	Italy	2004-2006	Sole proprietorships	Female loan officers tend to grant less credit to new and unestablished firms
Benvenuti, Gallo and Kim (2013)	Italy	2001-10	Banks	Gender diversity on boards helped reducing ex post risk for banks
Berger, Kick and Schaeck (2012)	Germany	1994-2010	Banks	Board changes that lead to higher female participation increase bank risk
Bianco, Ciavarella and Signoretti (2013)	Italy	2008-10	Listed various sectors	Positive correlation between women presence on Boards and the number of board meetings but not with meetings' attendance.
Carter, Simkins and Simpson (2003)	Various	1997	<i>Fortune</i> 1000 firms	Positive correlation between female participation on boards and the shareholder value.
Croson and Gneezy (2009)	Literature survey	- - -	- - -	There are gender differences in risk, social and competitive attitudes
De Andrés and Vallelado (2008)	OECD countries	1996-2006	Banks	Inverted U-shaped relationship between bank performance and board size
Foti (2011)	14 European countries	2007-09	Banks	Women are more present on larger and younger boards, with more independent members and in family-owned banks
Guiso and Rustichini (2011)	Italy	2008-2009	SMEs	Female entrepreneurs show more masculine traits
Gulamhussen and Fonte Santa (2010)	OECD countries	2006	Large banks	Negative relation between female presence on boards and riskiness; positive relation with profitability (ROA, ROE)
Italian Banking Association (2011)	Italy	1997-2009	Banks	Women in Italian banks are on average more present than in other economic sectors, are younger than men and more educated. However their presence on boards is still very low (even though growing).
Mateos de Cabo, Gimeno and Nieto (2012)	Europe	2006	Banks	The presence of women on boards is higher in low-risk banks, in banks with larger boards and in banks displaying higher rates of growth of assets.
Schwizer, Soana and Cucinelli (2012)	Italy	2007-09	Listed various sectors	Positive correlation between the presence of women on Boards and the monitoring activity of the Board of Directors and the number of meetings of the audit committees.
Shrader, Blackburn and Iles (1997)	US	1992-93	200 large firms	Firms' performance cannot be predicted by a high percentages of women top managers and board members.
Tarantola and Magliocco (2000)	Italy	2000-2005	Public and private sector	Women in banks' senior management are less present than in other Italian sectors and in comparison with other European banking systems.

3. Sources and data

The main questions of this study are analysed by using a panel dataset built combining information on bank board members with data on the characteristics and performance of the banks where they sit. The panel includes three kinds of data: 1) individual features of board members that are collected from the OR.SO. (“*Organi sociali*” – Bank Boards) Bank of Italy’s database, which is a historical archive of information on boards of all banks and financial intermediaries under the supervision of the Bank of Italy;⁵ 2) bank characteristics (i.e. legal form, size, geographical area of the administrative headquarters, etc.), which are collected from the Bank of Italy’s Census; 3) data on bank performance and riskiness that are from the Bank of Italy’s Supervisory Register and balance sheet data. The dataset used in this paper range from 1995 to 2010.⁶

The boards considered in this study are the following: Boards of Directors, Supervisory Boards or Boards of Statutory Auditors, General Management and the boards nominated in default procedures.⁷ Details about the way in which these boards are classified following the Italian law are provided in the Appendix A.

⁵ Data include census information on members (name, date and place of birth, residence, educational degree, etc.), information on the role in the board and its duration (appointment date, cessation date, causes of cessation, etc.).

⁶ The database is used only until 2010 because of data and law discontinuity in the following years. On the one hand, the OR.SO. archive was partially reorganized in 2011 and this does not allow to carefully compare bank mandates after and before that reorganization. On the other hand, in 2011 quotas for bank listed boards was introduced, thus creating a discontinuity in regulation after and before 2011 and between listed and non-listed banks.

⁷ That is procedures like: *Amministrazione controllata*, *Amministrazione straordinaria*, *Liquidazione coatta amministrativa*, *Fallimento*.

As for individual board member characteristics, age, tenure and education are directly calculated from OR.SO. Education is a dummy variable (*B.A. degree*) assuming the value of one if the member has at least a B.A. degree (*laurea*);⁸ the role of family affiliation with the controlling agent is caught by a dummy variable (*family bank*) which takes the value of one if the board member belongs to the family that controls the bank. A dummy for membership in the same municipality where the member was born is introduced to take into account the role of the knowledge that the board member has of the local environment in which the bank operates, as well as the fact that the member is known in the same environment; the variable assumes the value of one if the board member lives (and presumably works) in the same municipality where s/he was born.

As for bank characteristics, the log of total assets (*sizebank*) is used as a measure of the bank size.⁹ The legal form of the bank is taken into account through four dummy variables (limited dependent bank - *società per azioni* -, cooperative bank - *banca popolare* -, mutual bank - *banca di credito cooperativo* - or a branch of foreign bank). Dummy variables are also introduced to control for the geographical location of the headquarters, grouping Italian regions in four areas (North-West, North-East, Centre and South), and to control whether the bank is listed on the Italian Stock Market or not (dummy *listed bank*).

Finally, data on bank performance include the ratio between operating costs and the income margin (*ceffbank*), which is a measure of cost efficiency. The profitability of a bank is measured through the ratio between profits before taxes and total assets (*roabank*). The

⁸ Unfortunately, there is not a clear identification of the degree of education in the dataset, thus this variable could be underestimated.

⁹ In some estimates a dummy variable (small bank) is also inserted, based on Bank of Italy's categorical classification which takes into account bank total assets.

ratio between non-performing loans and total loans (*riskbank*) provides information on the riskiness of the bank portfolio.

Table a1 summarises descriptive statistics on the whole dataset used in the following econometric analysis together with variable definition.

The panel dataset at member individual level has about 253,000 observations and is used to present some descriptive statistics on female representation on bank boardrooms and to estimate the probability of gender-diversity on boards. On average in the whole period, an Italian bank board member was 54 years old and maintained the position for 5 years and 3 months (Table a1). One member over two had at least a B.A. degree and a slightly higher share was born in the same municipality where s/he lived and worked. Both results seem to be driven by the presence of a large number of small (and mostly mutual) banks in the sample, whose members are on average less educated and more likely to be born in the same municipality where they operate. Finally, less than 2 per thousand of total board members are in charge on banks belonging to their own family, considering the very little number of family banks in Italy.

Possible correlations between the number of women in boardrooms and bank performance has been run at bank level, thus collapsing the previous dataset. The resulting dataset includes more than 15,000 (bank-year) observations.¹⁰

4. Women in Italian bank boardrooms: some stylized facts

At the end of 2010 the share of women in all kinds of bank boards was only 7 per cent,¹¹ even though data show a sensible increase from 1995, when the share was around 2

¹⁰ In order to clean balance sheet data, we have set outliers of performance indicators to the 1st and 99th percentile of their annual distribution and those of the riskiness indicators to the 5th and 95th percentile.

per cent (Figure a1). Women are more represented on “Supervisory Boards”, that is on Boards with monitoring tasks, which is in line with the result of Adams and Ferreira (2009) for non-financial firms; moreover, the share of women decreases while approaching the top board membership (Figure a2).

As it has been found for Italian listed firms (Bianco *et al.*, 2013), in most cases when a woman sits on a bank board, she is the only one: in the whole panel of banks over the period 1995-2010, in almost 60 per cent of the (bank-year) observations there was not female presence on boards, and in around 30 per cent of the cases there was only a woman (Figure a3).

In 2010 the average (and median) number of board members was 16.9 and the mean number of women memberships was 1.2 (Table a2), that is one female memberships over 15.

Women are in general younger than their male counterparts, even though the age gap has decreased over time, and their tenure is shorter.¹² The gender gap on education (which is slightly higher for men) is not statistically significant (Table a3). In case of family affiliation, women are more represented on boards, with an average number of 1.5 in 2010 (0.7 in 1995).

¹¹ The analysis also considers boards in case of default procedures. However, since these are very rare events, the main results presented in this paper do not change if these observations are excluded from the sample.

¹² The tenure gap seems to be increased in the recent years. It should be noticed that the tenure of memberships is underestimated in OR.SO., mainly in the first years after the foundation of that database (in the half-Nineties), since the fact that some members were already in office in previous years is not always correctly recorded.

5. The econometric strategy

To investigate gender diversity in decision-making within Italian banks, and the subsequent effect on economic performance, we estimate different kinds of regressions.

Firstly, extending previous results (see Del Prete and Stefani, 2012), we test whether female board members are equally likely to reach top positions as compared to their male counterparts, in order to investigate the main individual characteristics which can favour or obstacle women to sit on bank boards. To this end estimations are run using information on each top management position at individual level, also controlling for those roles that, in the Italian case, are associated with decisional powers on bank strategies and lending policies, namely the Chairman of the Board of Directors, the Chief Executive Officer (CEO), the members of the Executive Committee and the General Manager.

Moreover, using these key-roles, we estimate the likelihood of being in high decision-making positions, conditional on being a board member, by using the same panel with the information on each j individual, having a mandate in bank i at time t . Thus, in both equations in model (1), one is able to control for individual characteristics (summarized in vector X_j , such as age, tenure, family affiliation, and particularly gender), for bank-level features (Z_i) potentially correlated with the board composition (size, headquarters' localization, governance framework and bank performance), and finally for cyclical effects, accounted by time dummies (d_t):

$$\Pr(y_{jit} = Female) = f(\alpha, \beta X_j, \delta Z_i, d_t, \varepsilon_{jit}) \quad \text{with } y_{jit} = 1, 0 \quad (1a)$$

$$\Pr(y_{jit} = TopMember) = f(\alpha, \beta X_j, \delta Z_i, d_t, \varepsilon_{jit}) \quad \text{with } y_{jit} = 1, 0 \quad (1b)$$

y is, in the first equation (1a), a dummy variable that is equal to 1 when the individual j sits in a top bank boards and she is a woman (dummy *Female*), and zero otherwise; in the second equations (1b) y is a dummy variable that is equal to 1 when the individual j is in

charge in a boardroom of bank i at time t in one of the positions mentioned before as top decisional positions (dummy *Top Member*), and zero otherwise.

Secondly, we measure the correlations between women's participation in bank boards, performance and riskiness. More precisely, we investigate the relationship between the number of women serving on all kinds of Italian bank boards – with a focus on the Boards of Directors – and the explanatory variables presented in previous equations, accounting for individual-level characteristics and for bank-level features. To this purpose, extending to a panel dataset the econometric strategy by Mateos de Cabo *et al.* (2012), we run Poisson regressions where the endogenous variable is defined as the number of women on bank boardrooms (Y_{it}).¹³ This variable can take discrete integer values ranging from zero to the maximum number of board members in different years. The choice of Poisson-distributed data seems adequate since they have the feature of presenting high frequencies of zeros and a high proportion of the sample that clusters on a relatively few, integer (small) values, which is clearly the case when the variable is the number of women in a bank board, as shown by previous descriptive evidence.

In a Poisson regression, each observation y_{it} is the outcome of a random variable with a Poisson distribution of parameter λ_i . So, using a collapsed dataset at bank i -level and a regression as in equation (2), we estimate the probability that the number of women sitting on all kinds of boards at time t is equal to a given number y_{it} , controlling for a vector X_{it} of independent variables, including board average characteristics, governance related banks' features and performance indicators.¹⁴

¹³ By using panel estimation approach and appropriate lags of bank performance, one can reduce reverse causality problems and endogeneity concerns that can arise in a more severe way in cross-section analysis.

¹⁴ For more details on this kind of analysis, see Del Prete and Stefani (2013). The Poisson distribution is characterized by the so-called equidispersion property, that is mean and variance are equal. In applied exercise

$$\Pr[Y_{it} = y_{it} | X_{it}] = \frac{(\lambda_i)^{y_{it}}}{y_{it}!} e^{-\lambda_i} \quad \text{with } y_{it} = 1, 2, 3, \dots \quad (2)$$

Thirdly, in order to measure if female presence on board could affect economic outcomes, we directly investigate the impact of gender diversity on bank performance and riskiness – and, indirectly, the role of diverse gender risk aversion – through the estimation of some performance equations, as follows:

$$PerformanceIndex_{it} = \alpha + \beta(DummyFemale)_{it-2} + \varphi X_{it-1} + \nu_i + d_t + e_{it} \quad (3)$$

where the dependent variable is alternatively a bank performance indicator (risk, profitability, cost measure, etc.), X stands for a vector of explicative variables concerning board and bank level characteristics, ν represents the vector of bank specific effects (time invariant and unobservable under fixed effect estimations), d are time dummies for cyclical common effects, and *DummyFemale* is a dummy variable (the focus of the analysis) that is equal to 1 if there was at least a woman on bank boards two years before (that is, at time $t-2$). We prefer to use a dummy female variable instead of the share of women, because – as suggested by descriptive evidence – the presence of women on all kinds of top boards is a very rare event in Italian banks. Therefore, as a matter of fact, the share of women is very close to zero in all banks and the distribution has a low variance, so it seems incorrect to consider the female presence as a linear variable. Moreover, the dummy female is introduced in the model with a 2-year lag with respect to the time referring to the

this condition is rarely satisfied, because real distributions are often overdispersed. In the dataset used in this paper the overall mean and variance of number of women on boards are quite similar (0.66 and 0.88, respectively) and the overdispersion hypothesis has been rejected on the basis of the test proposed by Cameron and Trivedi (2005).

dependent performance indicator: that is because, on the one hand, the presence of women on Italian bank boards has slightly increased only in the second part of the last decade, and, on the other hand, it is plausible to assume that the effect of gender diversity on boards (as it is a rare and recent event) takes much more time with respect to other boards features in order to generate its real effects on bank performance and riskiness.

6. Main determinants of female presence in top boards

6.1 Female members on board and decisional power

In line with the evidence found for other countries, the main results on the probability for women of being in top positions in Italian bank boards highlight the presence of a real gender gap.

Our probit estimations of equation (1) confirm and extend the results reported in Del Prete and Stefani (2012 and 2013), with different models and a larger set of dependent variables (Table a4).

First of all (Model I), the probability of sitting on all kinds of bank boards for a woman is enhanced just by the family affiliation in the (rare) hypothesis of family banks. All the other individual or bank characteristics are in general not significant or hamper the likelihood for women to reach top positions, especially top decisional memberships, as it is pointed out by the negative effect stemming from the dummy *top executive*. The past degree of riskiness seems to favour the presence of female individuals on boards, but its marginal effect is very close to zero.

Secondly, being a female member reduces the probability of being appointed in key decisional positions (as Chair of the Board of Directors, as CEO or General Manager) by around 15 percentage points with respect to male directors (Model II), and this probability is slightly higher for mutual banks, as showed by the negative interaction term between the

dummy female and the dummy mutual bank.¹⁵ These further results confirm the existence of a “second glass ceiling” (Del Prete and Stefani, 2013), which prevents women from reaching decisional top positions, once they sit on boards as simple members.¹⁶

In order to take into account differential effects stemming from individual skills in case of female directorships, in Model III the dummy *female* has been interacted with the other individual characteristics (age, tenure, family affiliation, education, etc.). Interaction terms are not generally statistically significant, with the exception mainly for the age variable (positive and significant) and the dummy BA degree and tenure (negative and significant), signalling that the probability for a woman of sitting on top decisional roles is further higher the higher is her seniority and the lower is her educational level and her experience.

Turning to bank-level variables (see Model II and III), being appointed in decisional positions is more likely in larger banks, with larger boards and a higher number of top positions (see also Section 6.2). Nevertheless, past bank performance, and in particular bank portfolio riskiness, does not exert any relevant effects on the estimated probability (the marginal effect is close to zero).

6.2 The role of board features and past bank performance

The main findings of the Poisson estimation on our panel of banks suggest that the number of women in any bank boards is correlated with both board characteristics and

¹⁵ Given the estimated marginal effect of the dummy female (-15 percentage points) and given that the fraction of top executive members, in charge in the overall period, is on average 32 per cent in the dataset, this means that women are roughly 50 per cent less likely to be appointed in a top executive position than men.

¹⁶ The “first glass ceiling” is the one that prevents women from entering a board. In our analysis, we cannot investigate its determinants, since we observe individual characteristics only of those people who have been already appointed as board members.

past bank performance. Since we can control for many bank characteristics over time and also for the evolution of governance structure, we have used bank random effects for the baseline specification (Table a5, Model I).

First of all, the positive correlation of board size with the presence of women seems to confirm the “preference for homogeneity” hypothesis, in line with the evidence highlighted in the literature, and, at the same time, it seems to rule out “tokenism” (see Section 2). However, the negative sign of the squared board size variable highlights a non-linear (U-shaped) effect. This result may reveal that when the board size reaches a given threshold, an additional female candidate could face more obstacles to enter the board because of a more stringent male collusive behaviour; in other words, in very large boards the “tokenism effect” (that we excluded at a first stage) could appear.

In line with the homogeneity approach, the share of memberships with a family affiliation positively affects the number of women on bank boards and, as expected, younger boards are more likely to be open to gender diversity. However, in our estimations education is not significant and the share of members born and living (operating) in the same municipality, as well as the mean age of the top members, negatively correlates with the number of women on boards. These apparently surprising results may be driven by the very frequent case of (generally small) banks managed by senior men with consolidated connections with their local environment.¹⁷

¹⁷ This result can also be interpreted as an indirect evidence of the more general phenomenon of the “reduced pool of women candidate” to manager positions, that is the fact that women tend to abstain from candidating to top positions because of all those socio-cultural obstacles (lack of long-term career commitment, familiar responsibility, etc.) which induce them to sacrifice their personal career and their relationship experience (an important prerequisite in banking sector) in favour of their family and private life (see also Bertrand and Hallock, 2001).

Focusing on bank-related characteristics, the presence of women positively correlates with the *status* of cooperative bank (*banche popolari*), generally medium-sized intermediaries, and with banks belonging to top-five groups or listed in the stock market, in line with the more contestability governance of these greater and public banks. By contrast, it seems that geography does not matter since there are not statistically significant differences between banks located in different Italian areas.

With the aim to account for the impact of the past performance on the current female presence on boards, we added to the model some lagged financial, profitability and risk indexes (size, capital, cost-to-income ratio, ROA, bad loans on total loans.¹⁸ The cost to income ratio (a bank efficiency measure) and the incidence of capital and reserves on total assets (a proxy of leverage in banks) turn out to be significant and inversely correlated with the presence of women when we consider all boards without distinction of scope (Model I).¹⁹ By contrast the past profitability is not always significant. The negative correlation with the measure of efficiency of the banking sector seems to be consistent with Becker's theory (Becker, 1957), claiming that gender discrimination is lower in more competitive and dynamic markets. Finally, the presence of women is higher the higher the incidence of bad loans in the past: this suggests, that women are more likely in banks whose credit portfolio

¹⁸ We generally use one-year lag for performance indicators with the exception of the index of portfolio risk for which we use 2-year lag, since impaired and non performing loans need at least two years to be recorded as bad loans.

¹⁹ The size of the bank (measured by the natural log of the total assets) is negatively related to gender diversity on boards, hinting that in larger banks, when the volume of activity increases, the tokenism may operate in a more severe way (a further non-linear effect of bank size).

needed to be restructured, as it has been similarly found in other empirical literature (Ryan and Haslam, 2008).²⁰

Restricting the analysis to those women serving on Boards of Directors or on General Management (Table a5, Model II), the effects of board characteristics generally hold, once having controlled for more bank-level features; nevertheless, none of these bank economic indicators are relevant in this specification. These findings on women's presence on all kind of bank boards and past performance are mostly driven by their participation in supervisory boards, and this evidence is once again consistent with their female attitude of being more inclined to monitor and control bank outcomes (particularly, costs and risks).

The evidence that such results are statistically significant when we consider all women sitting on boards but tend to disappear focusing on those serving on top decisional positions (as shown in Model II) can also be seen as a signal of *statistical discrimination* (Schubert *et al.*, 1999). In these terms, the perception that female board members are less risk-prone than men would generate the idea that they are less reliable in making the risky decisions that may be necessary for a bank's success; consequently they would be excluded from positions involving a greater degree of risk, and thus most often relegated to monitoring roles. However, their presence can be crucial in decisional levels when more rigorous credit policies are needed or in the case of bad performance, as in the recent economic and financial crisis. Conversely, results of non-correlations between women in charge as directors or general managers and past bank performance may also suggest that

²⁰ Using data on FTSE 100, the authors find that when a woman is appointed in a top position, it is more likely for her (than for a man) that that position is risky or precarious, since it more often concerns a problematic organization. In other words, it is more likely for a woman, after being chosen for a top position, to find herself on a "glass cliff". The "glass cliff" hypothesis is not confirmed by Adams, Guptha and Leeth (2009), using data on CEOs in US firms.

women having decisional powers are presumably more risk-loving and more similar to men's preferences, as pointed out by recent empirical studies (Adams *et al.*, 2011).

In order to test the robustness of the previous results, the rare event of the women's presence on banking boards has been analysed using alternative estimation techniques instead of the Poisson regression with random effects (see Table a5, Model III and IV).

The first aim is to verify if the hypothesis of random effects is plausible, by estimating equation (2) using the panel Poisson regression with bank fixed effects. The concern is that, even if the set of bank-level characteristics among explicative variables is quite large, there may be relevant omitted variables, which are time-invariant (i.e. bank culture and organization) and correlated with the independent indicators (above all performance indexes). The main findings (not reported) from the baseline specification hold also with the alternative estimation, both for board characteristics and for bank features (see also Del Prete and Stefani, 2013).

A second robustness check is linked to the fact that in our dataset the number of zeros is high.. To take care of this problem, we estimate equation (2) by using a negative binomial technique with bank random effects, and we actually obtain similar results in the magnitude of estimated coefficients, as well as in their statistical significance (Table a5, Model III). The advantage of the negative binomial relatively to the Poisson is that the former deals more carefully with distributions with higher incidence of zeros, as in the dataset we use.

Since, in our case, it is plausible that λ of the Poisson regression is close to 1, then estimating a Poisson equation is quite equivalent to estimate a binomial model. So, in a third econometric exercise the baseline specification has been estimated by using a panel probit regression (a dichotomised model) with random effects, since we control for many bank level characteristics. In this case the dependent variable is a dummy that is equal to 1 if the bank i at time t has got at least a woman sitting on its boards. Once again, results are

similar to those obtained in the baseline estimation with the Poisson regression (Table a5, Model IV).

7. The effect of gender diversity on banking riskiness and economic performance

Previous results suggest that past bank performance may significantly affect the current female presence on top boards. The correlation between gender diversity and ex-post bank performance, which is the third aim of our analysis, can be investigated through the estimation of performance equations, as shown in the last step of our econometric strategy.

Estimating performance equations may therefore be seen as a first attempt to shed light on the link between bank performance and women and men's different attitudes to risk and monitoring. In addressing this relevant question we have to take into account endogeneity problems stemming from potential reverse causality. In other words, we cannot be sure we have correctly identified the direction of the causal effect, since it is plausible that female presence can affect future bank performance, and that this performance further enhances a gender diversity approach relative to underperforming intermediaries. It is important to point out that the composition of the board may be endogenously determined. In this respect both past and expected performance may influence the appointment of independent or female members.

Actually, these endogeneity issues are so relevant and difficult to overcome that most of the empirical results on gender diversity and economic performance are so far mixed and not conclusive. In the following empirical exercise, we have adopted a stepwise approach: we start by shedding light on conditional correlations and we then tackle

endogeneity problems with IV estimations, to clearly identify the causal link between female presence on bank boards.

Considering the relevance of risk measures and relative control in the banking sector, we have distinguished risk indicators from performance indexes. Among the formers, we have used three different measures of credit portfolio quality: *a*) the share of bad loans over total loans; *b*) the probability of default of the bank loan portfolio (as the ratio between new bad loans and lagged performing loans); *c*) the impairment ratio, as net credit impairments on total loans. Among the banking performance measures, we considered: *a*) a profitability index (ROA), calculated as earnings before taxes on total assets; *b*) a cost-efficiency index, as the ratio between operating costs and income margin; *c*) a capital ratio, as the ratio between capital and reserves and total assets.

In Table a6 we present econometric results stemming from panel estimation with bank fixed effects, in order to take into account individual time-invariant features (organization, history, etc.) or which vary slowly across time (as location, size, etc.) and which could be correlated with board composition or other explicative variables. However, even if we insert lagged bank governance variables into the model, these estimates are intrinsically endogenous, for reasons previously noted, and they highlight simple correlations between female presence on boards and bank outcomes.

Focusing on riskiness indicators, everything being equal, a negative correlation emerges between women's presence on bank boards in the recent past (two years before) and the current level of bank portfolio riskiness, using as dependent variable the share of bad loans over total loans.²¹ It can be interpreted as a first signal of a more prudent behaviour when women sit on boards (which may be linked to their generally higher risk-aversion), since

²¹ A similar result is obtained by Adams and Ragnathan (2012) using IV estimation in an equation where the (log) fraction of bad loans is regressed on the fraction of women on boards.

their presence originates monitoring spillovers on corporate governance, particularly beneficial in case of financial turmoil. However, when we pay attention to other performance indicators, we do not find any different significant effect on profitability, cost-efficiency and capitalization originating from gender diversity on boards. Focusing on the other governance features, we see that the tenure (and so the level of entrenchment in manage the bank) of top members is the most important variable correlated with both riskiness and performance indicators.

With the purpose of better disentangling the causal link, performance equations have therefore been re-estimated by using panel regressions with bank fixed effects and 2SLS techniques.

It is important to point out that we potentially deal with two sources of endogeneity problems. On the one hand, our results could be biased for relevant omitted variables; on the other hand we could not be able to well identify the causal link between performance indicators and female presence on boards due to reverse causality. Concerning the first point, we control for many bank and board characteristics varying over time, and moreover for bank fixed effects to take into account bank specific features that are time invariant (organization, governance, history, etc.); so, we are confident to overcome bias due to omitted variables. As far as reverse causality issues, we follow an econometric estimation strategy with instrumental variables. The obstacle is to find a “good” instrument for board characteristics, correlated with the presence of women on board but not with performance indicators.

Adams and Ferreira (2009) run IV estimates of their performance equations and they build a powerful instrumental variable for the share of women on boards by exploiting male and female connections; so, they use as an instrument the fraction of male directors on the board who sit on other boards on which there are female directors. Even if

exploiting male directors openness to female presence is a good strategy, we believe that this is not sufficient to ensure the orthogonality of the instrument to the dependent variables. It is possible that these male directors influence bank performance if they have a long tenure in the same bank.

A useful instrument for female presence, which could overcome such problem, would be the share of “independent” top members, but this variable is not available in our dataset. We have therefore used the share of “outsider” board members, identified, as those people with a maximum of one-year tenure in the same bank: this variable is correlated with the female presence but less with the bank outcomes (Table a7), considering the tenure in the same bank as a proxy of the level of entrenchment. Indeed, it is plausible to assume that outsider members are, on the one hand, not yet involved in “collusive” behaviour with other male senior members to preserve gender homogeneity on boards and, on the other hand, they are too ‘junior’ in bank management to really affect bank performance.²² The relevance of this instrumental variable is confirmed by the results of the first stage estimation (see Tables a8-a9) where the estimated coefficient of the share of outsider members is positive and highly significant.²³

Table a8 reports the evidence of different indicators obtained by the IV estimations with bank fixed effects, using the share of outsider members as instrumental variable for the “presence of at least a woman on boards” two years before (taken with the same 2-year

²² In not reported IV estimations we have also used as instrumental variables further lags of the dummy female and, alternatively or jointly, the lagged values of bank size (measured in terms of log of total assets). The findings on the effect of female presence on riskiness are generally robust, but these instruments are less powerful, since female presence on boards is a relatively recent event in Italian banks.

²³ The F-statistics of the first stage is greater than 10 in all models, usually considered a good benchmark for the identification strategy.

lag).²⁴ Evidence suggests that, taking into account reverse causality problems, the presence of women on bank boards for at least two years reduces the incidence of impairments on total credits in a significant way, while does not affect significantly the stock of bad loans on total loans, as found previously (Table a6).²⁵

Gender diversity on boards seems also to positively affect profitability, as signalled by the estimated coefficient on the dummy female in the equation using ROA as dependent variable. It is plausible that this positive effect originates by more rigorous credit policies related to female presence on boards that is able to reduce loan losses and other costs.

However, as we can appreciate from the correlation analysis among bank governance variables (Table a7), all these variables are potentially correlated among them and with the bank outcomes, since they present a small variance over time. The reverse causality problems on the gender composition and its impact on bank performance can therefore similarly apply to all other board characteristic (age, family affiliation, education, etc.) used as explicative variables in our performance equations. For this reason, we have estimated some more parsimonious models in terms of board controls (Table a9). In particular, we have included among the explicative variables lagged bank performance indicators, the dummy for female presence (instrumented by the share of outsiders on boards) and the lagged size of the board, since bank fixed effects can capture the other board characteristics slowly varying over time. Results on the impact of gender diversity on riskiness and performance are confirmed and are more significantly robust. Other things being equal, the

²⁴ The tenure of top members has been excluded from the explicative variables, since it is used to define our instrument and presents a high correlation with the share of outsiders (Table a8).

²⁵ This result is in line with Benvenuti, Gallo and Kim (2013). Even if these authors do not focus on gender issue, they find – among other results on bank governance – that a higher share of female directors lowers the ex-post credit risk, using a Tobit model.

positive effect of greater gender diversity on riskiness emerges both in terms of reduction of impairments on credits and of decrease in the bank default rate. Moreover, the more rigorous and effective monitoring of risky loans implied by higher female presence generates positive spillovers over time on bank profitability, as shown by the positive effect on the ROA indicator.

8. Concluding remarks

Italy is one of the EU countries with the lowest representation of women on bank boards. Using a unique dataset on board composition and bank characteristics, the main findings of this paper are consistent with gender discrimination within Italian bank boardrooms, with reference to board memberships. As highlighted by other studies concerning the major European countries and the United States, women are less likely to sit on key decisional levels (Chairman of the Board of Directors, CEO or General Manager), while they are more likely to serve on supervisory boards. This result suggests the presence of a second glass ceiling, that is an additional obstacle after the one which prevents women from sitting on boards. In a male-dominated context, this result may derive from some preference for homogeneity, mainly due to social and cultural factors. If women are supposed to have a more conservative attitude than men, they may consequently be excluded from those positions that are more related to risky decisions, and that may be relevant for a bank's success [short term profitability?]. Nevertheless, when past bad performance are to be corrected or more rigorous credit policies are needed, as in crisis periods, their presence can become crucial and a very valuable asset. Using performance equations and controlling for endogeneity, our results show that gender diversity on boards tends to positively affect the quality of credit and bank profitability.

These outcomes, which appear to be robust to reverse causality, stem from female higher risk awareness and monitoring attitude.

This paper therefore provides evidence on beneficial effects of women participation in top boards, even though they are still rare in Italian banks: that is why they may be considered as “gold dust”. This results may then provide some insights into the debate on how to improve corporate governance in banks, an issue that has become even more crucial during the recent crisis, when it has been recognized that the inability to manage credit risk, over and above the management of general bank strategy, has played a relevant role. The risk averse attitude of women, who are also more inclined than men to monitor risky activity, could be considered as an asset in the implementation of credit policies in order to better control and contain risk exposure. It will be interesting to confirm our results by replicating the exercise when the recent Italian quota law for listed firms, which include the main banks, will be completely implemented and their board will be composed by women for at least 30 per cent.

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APPENDIX:

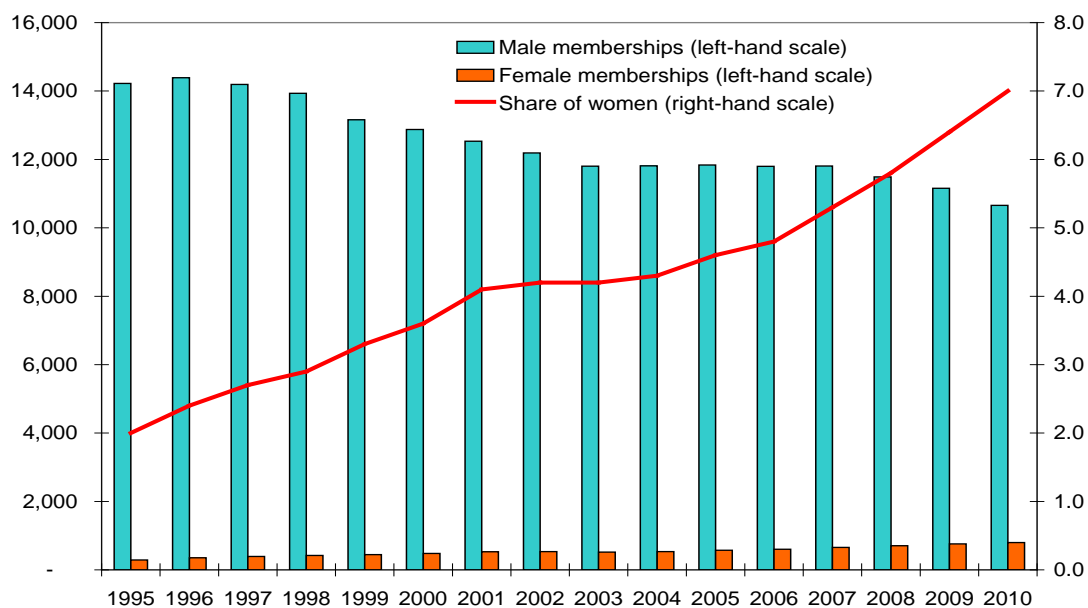
A. Top Boards in Italian Banks

Following the 2003 company law reform (see. D.Lgs. 17.1.2003, n. 6, which came into force from 1.1.2004), Italian banks can choose either a traditional or a two tier (dual) board regime. The law includes also the possibility of a monistic regime, that no Italian bank has adopted so far. The dual regime has been adopted only by a few banks, starting from 2007. The traditional regime has a Board of Directors (*Consiglio di amministrazione*), with some committees (Executive Committee, *Comitato esecutivo*; internal control committee, nomination committee, etc.), and a Board of Statutory Auditors (*Collegio sindacale*). The two tier model has a Supervisory Board (*Consiglio di sorveglianza*), and a Management Board (*Consiglio di gestione*). For the purposes of this paper, all the members of *Consiglio di amministrazione* in the traditional regime and of *Consiglio di gestione* in the dual one are considered as “board members”. The members of both *Collegio sindacale* (traditional regime) and *Consiglio di sorveglianza* (dual regime) are instead considered as “members of Supervisory Boards”.²⁶ This study also takes into account information on the General Management (*Direzione generale*).

²⁶ In some Poisson regressions and robustness checks (Section 6) the effects of the dual governance regime adopted by some banks are however taken into account through a dummy variable (Dummy dual governance).

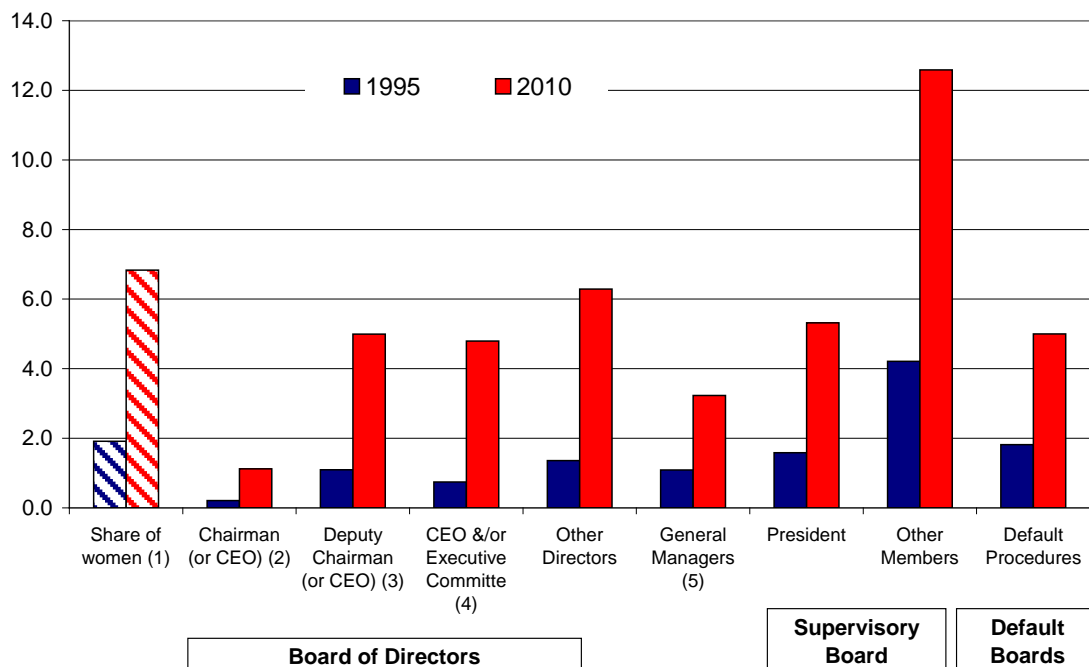
B. Figures and Tables

Figure a1 – Share of women on bank boards
(units and percentage values)



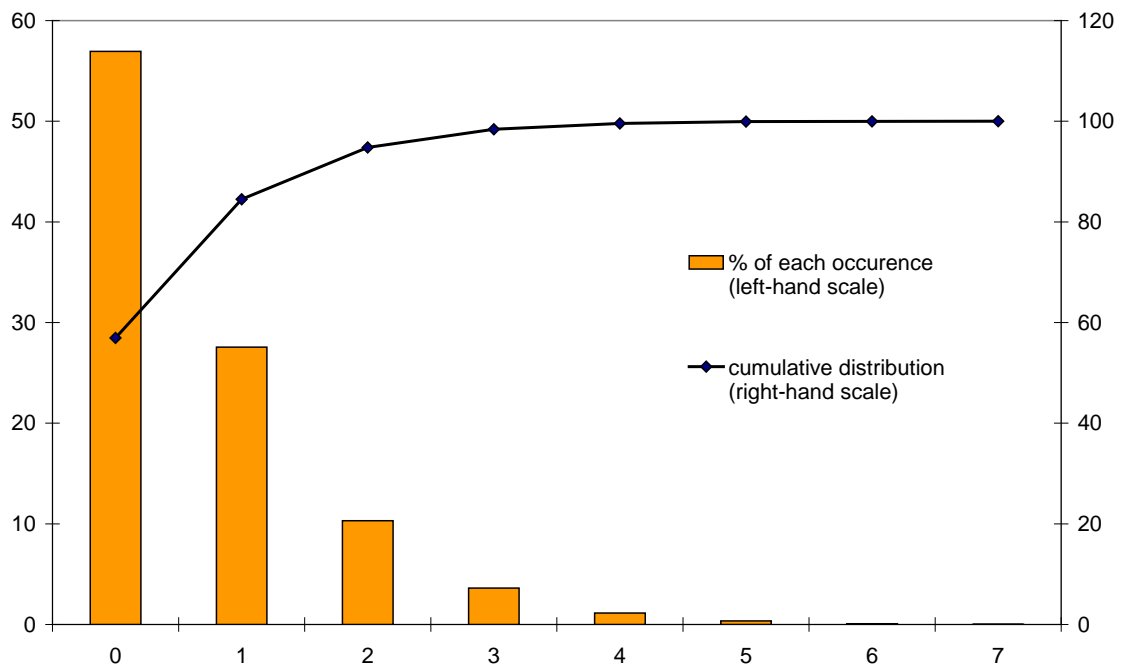
Source: computations on the Bank of Italy's OR.SO database.

Figure a2 – Share of women's memberships by different kinds of bank boards
(percentage values)



Sources: computations on the Bank of Italy's OR.SO database. – (1) Data include, also for fractions of year, memberships in each kind of bank boards (administrative, executive, supervisory boards and boards set in case of default procedures). The sum of different kinds of board memberships exceeds the total because a person can be member of several boards in a given bank in a given year. – (2) It includes the Chairman of the Board of Directors also when s/he has other positions at the same time, including the one of CEO. – (3) It includes the Vice president of the Board of Directors also when s/he has other positions at the same time, including the one of CEO. – (4) Excluding the case in which the CEO is also either the Chairman or the Deputy Chairman of the Board of Directors. – (5) It includes the General Manager, the Deputy General Manager and equivalent positions.

Figure a3 – Frequency and cumulative distribution function of number of women in Italian bank boards
(units and percentages)



Source: computations on the Bank of Italy's ORSO database.

Table a1 – Description of the explicative variables and main descriptive statistics

Variable Name	Variable Definition	n. obs.	mean	median	std. dev.
Variables at board member level					
Age	Age of board members (years)	253,033	54.34	54	11.16
Tenure	Length of <i>charge</i> per board member in the same bank (years)	253,033	5.38	4	4.37
Dummy family bank	Dummy variable assuming value equal to one if the board member is affiliated to the family that controls the bank	253,033	0.002	0	0.04
Dummy B.A. degree	Dummy variable assuming value equal to one if the board member holds at least a B.A. degree	253,033	0.50	1	0.50
Dummy membership in the same birth municipality	Dummy variables assuming value equal to one if the birth municipality coincides with the one in which s/he lives (that is the person has a board membership in the same municipality in which s/he was born)	253,033	0.54	1	0.49
Nr. memberships in the same bank	Number of different memberships that a given person had in the same bank during the sample period (e.g. General Manager and Chairman of the Board of Directors or CEO or others)	253,033	1.54	1	0.81
Variables at bank level					
Sizeboard	Number of board members	15,167	16.68	16	7.31
Sizeboard-squared	Square of the number of board members	15,167	331.78	256	293.87
Number of women per bank	Number of women , considering each kind of bank top boards	15,167	0.66	0	0.94
Share of women	Share of women (in percentage points) in all kind of bank boards (administrative and supervisory boards) at the vertex of each bank	15,167	4.14	0	7.25
Dummy limited company bank	Dummy variable assuming value equal to one if the bank is a limited company bank (<i>società per azioni</i>)	15,167	0.31	0	0.46
Dummy mutual bank	Dummy variable assuming value equal to one if the bank is a cooperative (<i>banca popolare</i>)	15,167	0.06	0	0.24
Dummy cooperative bank	Dummy variable assuming value equal to one if the bank is a mutual bank (<i>banca di credito cooperativo</i>)	15,167	0.56	1	0.50
Dummy foreign bank	Dummy variable assuming value equal to one if the bank is a branch of a foreign bank (<i>filiale di banca estera</i>)	15,167	0.07	0	0.26

Dummy North West bank	Dummy variable assuming value equal to one if the administrative headquarter of the bank is in a North-Western Italian region	15,167	0.26	0	0.44
Dummy North East bank	Dummy variable assuming value equal to one if the administrative headquarter of the bank is in a North-Eastern Italian region	15,167	0.32	0	0.47
Dummy Centre bank	Dummy variable assuming value equal to one if the administrative headquarter of the bank is in a Central Italian region	15,167	0.20	0	0.40
Dummy South bank	Dummy variable assuming value equal to one if the administrative headquarter of the bank is in a Southern Italian region	15,167	0.22	0	0.41
Dummy listed bank	Dummy variable assuming value equal to one if the bank is listed	15,167	0.03	0	0.18
Dummy for foreign presence	Dummy variable assuming value equal to one if the bank has branches or subsidiaries abroad	15,167	0.03	0	0.16
Dummy for banks belonging to a top5 bank group	Dummy variable assuming value equal to one if the bank belongs to one of the top 5 Italian banking groups (Unicredit, Intesa Sanpaolo, Banca Monte dei Paschi di Siena, Unione di Banche Italiane, Banco Popolare)	15,167	0.04	0	0.21
Dummy dual governance	Dummy variable assuming value equal to one if the bank has a dual governance regime, for years after 2007	15,167	0.00	0	0.04
Sizebank	Total assets (log of euros)	13,465	19.49	19.22	1.89
Ceffbank	Ratio between operating costs and the income margin of the bank (percentage), that is the cost/income ratio	13,288	71.47	67.29	33.95
Roabank	Ratio between profit before taxes and total assets (percentage)	13,231	0.80	0.90	1.57
Indcap	Ratio between bank capital and reserves, and total assets (percentage)	13,130	11.19	9.66	8.11
Riskbank	Ratio between non performing loans and total loans (percentage)	12,214	6.19	3.35	7.67
Default rate	Ratio between new bad loans and lagged performing loans (percentage)	11,527	1.61	1.02	1.71
Impairment index	Ratio between net credit impairments and total loans (percentage)	12,380	0.77	0.55	0.82
Dummy year	For each year in the dataset				

Sources: computations on the dataset employed in the estimations and matching individual level-characteristics (OR.SO. database) with bank-level features (Supervisory Reports).

Table a2 – Descriptive statistics on Italian banks' boards

(units)

Year	Statistics on all Banks			Statistics on board memberships (2)			
	Banks (1)	of which: mutual banks	of which: large and medium- sized banks	Mean	Median	Max	Max for women's memberships
1995	989	593	62	16.1	15	58	4
1996	991	609	60	17.0	16	49	5
1997	995	587	59	17.1	17	46	5
1998	986	585	60	17.2	16	55	6
1999	969	573	57	17.4	17	49	6
2000	936	543	57	16.9	17	50	5
2001	902	511	53	17.1	17	48	5
2002	873	481	56	17.1	17	77	5
2003	848	456	59	16.9	17	53	5
2004	819	444	57	16.9	17	46	5
2005	822	441	58	16.8	17	53	6
2006	827	438	57	16.8	17	62	5
2007	828	440	61	17.0	17	58	5
2008	828	432	55	16.6	16	52	6
2009	814	429	55	16.9	17	57	6
2010	791	421	54	16.9	17	70	7

Sources: computations on the Bank of Italy's OR.SO database. – (1) The number of banks in the sample is generally slightly higher than the one of the Bank of Italy's Annual Reports referred to the end of the year. Computations consider instead banks operating during the year, also if they operate only for fraction of it. – (2) Data include, also for fractions of year, memberships in each kind of bank boards (administrative, executive, supervisory boards and boards set in case of default procedures).

Table a3 – Individual characteristics of board members (1)

(years, percentage values)

Year	Age (years)		B.A. degree (%)			Tenure (years)	
	Female	Male	Share of women over memberships with a BA degree	female	male	female	male
1995	42.6	53.9	1.8	43.3	45.1	2.5	2.9
1996	42.1	53.8	2.5	46.3	43.4	2.7	3.4
1997	42.0	53.9	2.8	46.3	44.7	3.0	3.9
1998	42.3	53.9	2.9	46.1	46.3	3.3	4.3
1999	42.5	53.8	3.5	48.7	48.0	3.3	4.6
2000	43.1	54.0	3.6	50.1	49.5	3.5	4.9
2001	43.8	54.2	3.9	50.3	50.7	3.7	5.2
2002	44.4	54.4	4.0	49.8	51.9	4.1	5.5
2003	44.9	54.6	4.0	49.9	52.6	4.5	5.9
2004	45.3	54.9	4.2	50.6	52.5	4.9	6.2
2005	45.6	55.2	4.4	51.0	52.6	5.2	6.6
2006	46.3	55.6	4.6	51.9	53.3	5.5	7.0
2007	46.5	55.8	4.9	52.2	53.8	5.7	7.2
2008	47.0	56.1	5.5	52.0	54.0	5.6	7.5
2009	47.4	56.4	5.9	52.4	54.3	5.7	7.8
2010	47.9	56.7	6.6	52.5	54.3	5.8	8.0

Sources: computations on the Bank of Italy's OR.SO database. – (1) Data include, also for fractions of year, memberships in each kind of bank boards (administrative, executive, supervisory boards and boards set in case of default procedures).

Table a4 – Probability of being a woman in bank top boards or in top decisional positions (1)

<i>Dependent variables</i>	Model I: Dummy female	Model II: Dummy top executive (2)	Model III: Dummy top executive (2)
Dummy female		-0.151*** [0.035]	-0.245*** [0.031]
Dummy top executive	-0.017*** [0.002]		
Dummy family bank	0.193* [0.107]	0.264*** [0.080]	0.313*** [0.084]
Dummy membership in the same birth municipality	-0.005*** [0.002]	-0.040*** [0.006]	-0.041*** [0.006]
Dummy B.A. degree	-0.002 [0.002]	-0.060*** [0.007]	-0.057*** [0.007]
Age	-0.002*** [0.000]	0.001*** [0.000]	0.001*** [0.000]
Tenure	-0.001*** [0.000]	0.013*** [0.001]	0.014*** [0.001]
Nr. memberships in the same bank	-0.002* [0.001]	0.156*** [0.003]	0.156*** [0.003]
Dummy small bank	0.003 [0.003]	-0.115*** [0.009]	-0.113*** [0.009]
Dummy cooperative bank (<i>banca popolare</i>)	-0.003 [0.004]	-0.028*** [0.010]	-0.028*** [0.010]
Dummy mutual bank (<i>banca di credito cooperativo</i>)	0.005** [0.002]	-0.071*** [0.008]	-0.072*** [0.008]
Dummy foreign bank	0.017 [0.018]	0.692*** [0.004]	0.692*** [0.004]
Dummy North East bank	-0.004 [0.003]	-0.015* [0.008]	-0.014* [0.008]
Dummy Centre bank	0.001 [0.003]	-0.020** [0.008]	-0.019** [0.008]
Dummy South bank	0.000 [0.003]	-0.058*** [0.009]	-0.057*** [0.009]
Lag1 Riskbank (bad loans/total loans)	0.000* [0.000]	0.001** [0.000]	0.001** [0.000]
Dummy female* dummy BA degree			-0.070** [0.029]
Dummy female* dummy Family bank			-0.182 [0.167]
Dummy female * Age			0.005*** [0.002]
Dummy female * Tenure			-0.007* [0.004]
Dummy female * Dummy memb. in the birth municipality			0.036 [0.034]
Dummy female* Dummy mutual bank		-0.064* [0.033]	
Dummy female* Dummy small bank		0.062 [0.058]	
Dummy year	YES	YES	YES
Observations	213,864	213,864	213,864
Pseudo-R ²	0.1329	0.1085	0.1082

(1) Probit pooled estimations including a constant term (not reported). Marginal effects (at the average) are reported and robust standard errors are in brackets and are adjusted for cluster correction for groups of individuals (cluster correction for groups of banks produces similar results). * significant at 10%; ** significant at 5%; *** significant at 1%. – (2) A dummy variable that is equal to 1 when the membership is one of the following: Chairman of the Board of Directors, member of the Executive Committee, CEO or General Manager.

Table a5 – Poisson regressions, and alternative estimation techniques,
on a panel of Italian banks on the period 1995-2010 considering bank random effects in the estimations (1)

Dependent variable	Model I: Panel Poisson, bank RE	Model II: Panel Poisson, bank RE	Model III: Negative binomial, bank RE	Model IV: Panel Probit, bank RE
	<i>Nr. of women on all Boards</i>	<i>Nr. women on Boards of Directors or General managers</i>	<i>Nr. of women on all Boards</i>	<i>Dummy equal to 1 if there is at least a woman on Boards</i>
Sizeboard	0.073*** [0.010]	0.073*** [0.014]	0.073*** [0.010]	0.169*** [0.019]
Sizeboard-squared	-0.001*** [0.000]	0.000 [0.000]	-0.001*** [0.000]	-0.002*** [0.000]
(mean) Age	-0.075*** [0.006]	-0.078*** [0.009]	-0.075*** [0.006]	-0.155*** [0.010]
(mean) Tenure	0.000 [0.012]	-0.007 [0.018]	0.000 [0.012]	0.085*** [0.019]
Share of membership in family banks	4.448*** [1.296]	7.081*** [1.611]	4.448*** [1.296]	7.595** [3.114]
Share of membership with B.A. degree	-0.208 [0.134]	-0.173 [0.207]	-0.208 [0.134]	-0.279 [0.227]
Share of membership in the same birth municipality	-0.283** [0.137]	-0.556*** [0.211]	-0.283** [0.137]	-0.312 [0.226]
Dummy cooperative bank (<i>banca popolare</i>)	0.303** [0.146]	0.332 [0.216]	0.303** [0.146]	0.357* [0.202]
Dummy mutual bank (<i>banca di credito cooperativo</i>)	0.159 [0.117]	0.000 [0.182]	0.159 [0.117]	0.324 [0.222]
Dummy foreign bank	-1.155*** [0.302]	-0.660 [0.417]	-1.155*** [0.302]	-1.768*** [0.534]
Dummy North East bank	-0.066 [0.106]	-0.261 [0.159]	-0.066 [0.106]	-0.137 [0.198]
Dummy Centre bank	0.078 [0.117]	-0.087 [0.175]	0.078 [0.117]	0.487** [0.224]
Dummy South bank	0.132 [0.120]	0.056 [0.187]	0.132 [0.120]	0.336 [0.220]
Dummy for foreign presence	-0.420*** [0.162]	-0.525*** [0.202]	-0.420*** [0.162]	-0.769*** [0.212]
Dummy for banks belonging to a top5 bank group	0.227** [0.090]	0.092 [0.114]	0.227** [0.090]	0.341*** [0.127]
Dummy dual governance	0.168 [0.328]	-0.350 [0.448]	0.168 [0.328]	-0.186 [0.488]
Dummy listed bank	0.240* [0.137]	0.051 [0.173]	0.240* [0.137]	0.524** [0.208]
Lag1 Sizebank (log. total assets)	-0.062** [0.031]	-0.001 [0.045]	-0.062** [0.031]	-0.059 [0.055]
Lag1 Ceffbank (operating costs/income margin)	-0.003** [0.001]	-0.003 [0.002]	-0.003** [0.001]	-0.005*** [0.002]
Lag2 Riskbank (bad loans/total loans)	0.009*** [0.003]	0.004 [0.004]	0.009*** [0.003]	0.014*** [0.005]
Lag1 Roabank (gross profit/total assets)	-0.011 [0.019]	-0.036 [0.028]	-0.011 [0.019]	-0.053* [0.030]
Lag1 Indcap (capital & reserves/total assets)	-0.008* [0.005]	-0.007 [0.007]	-0.008* [0.005]	-0.005 [0.007]
Dummy year	YES	YES	YES	YES
Constant	4.838*** [0.728]	3.395*** [1.082]	22.267 [80.514]	7.916*** [1.304]
Observations (<i>Number of banks</i>)	10,756 (1,066)	10,756 (1,066)	10,756 (1,066)	10,756 (1,066)
Wald χ^2	1316.29***	790.88***	1316.29***	1242.80***

(1) In case of panel Poisson and negative binomial estimations with bank random effects (model I, II and III), coefficients are reported and standard errors (not robust) are in brackets; in case of panel probit RE estimate (model IV) coefficient are reported and relative (robust) standard errors are in brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%.

Table a6 – Effects of gender diversity on bank riskiness and performance: panel estimations (1)

<i>Dependent variables</i>	<i>Riskiness indicators</i>			<i>Performance indicators</i>		
	<i>Riskbank index : Bad loans on total loans</i>	<i>Default rate: New bad loans on lagged performing loans</i>	<i>Impairment index: Net credit impairments on total loans</i>	<i>Profitability index (ROA): Gross profit on total assets</i>	<i>Cost-efficiency index: Operating costs on income margin</i>	<i>Capital ratio: Capital and reserves on total assets</i>
Dummy for “at least a woman in bank boards” (Lag2)	-0.302** [0.136]	0.023 [0.035]	-0.007 [0.019]	-0.016 [0.027]	-0.193 [0.348]	0.061 [0.102]
Lag1 Sizeboard	0.004 [0.015]	0.011*** [0.004]	0.002 [0.002]	-0.005 [0.003]	0.059 [0.057]	0.038*** [0.014]
Lag1 (mean) Age	0.041* [0.024]	0.004 [0.007]	0.004 [0.004]	0.007 [0.006]	-0.090 [0.097]	0.004 [0.020]
Lag1 (mean) Tenure	0.107** [0.049]	0.051*** [0.015]	0.018** [0.007]	-0.032*** [0.010]	-0.172 [0.176]	0.03 [0.037]
Lag1 Share of membership in family banks	-3.078 [4.537]	3.949 [2.562]	1.165 [1.109]	-1.844** [0.793]	8.263 [13.851]	-14.485*** [3.026]
Lag1 Share of membership with a BA degree	0.105 [0.525]	-0.346** [0.157]	-0.052 [0.081]	-0.219* [0.129]	-1.814 [2.511]	0.366 [0.480]
Lag1 Sizebank (log. total assets)	1.424*** [0.289]	0.111 [0.071]	0.065** [0.032]	-0.353*** [0.077]	-4.852*** [1.257]	-3.443*** [0.313]
Lag1 Ceffbanc (operating costs/income margin)	-0.014** [0.007]	-0.004*** [0.002]	-0.002*** [0.000]	-0.008*** [0.002]		0.000 [0.008]
Lag1 Roabanc (gross profit/total assets)	-0.919*** [0.129]	-0.138*** [0.030]	-0.049*** [0.011]		-4.775*** [0.547]	-0.015 [0.129]
Lag1 Indcap (capital & reserves/total assets)	0.042 [0.033]	0.019*** [0.007]	0.001 [0.002]	-0.022** [0.009]	0.066 [0.154]	
Lag1 Riskbank (bad loans/total loans)				-0.014*** [0.004]	0.207*** [0.074]	0.062*** [0.021]
Bank fixed effects	YES	YES	YES	YES	YES	YES
Dummy year	YES	YES	YES	YES	YES	YES
Constant	-25.453*** [6.164]	-0.856 [1.498]	-0.823 [0.677]	8.373*** [1.705]	178.953*** [27.620]	78.015*** [6.285]
Observations	10,297	9,752	10,402	10,088	10,093	10,174
R-squared	0.78	0.53	0.52	0.48	0.63	0.77

(1) Panel of banks in the period 1995-2010. Estimations with bank fixed effects. Robust standard errors (corrected for heteroskedasticity) are in brackets.* significant at 10%; ** significant at 5%; *** significant at 1%.

Table a7 – Correlation among board characteristics and “outsider” members (1)

	Share of outsider top members	Dummy for female presence on boards	Age	Tenure	Family affiliation	BA degree	Sizeboard
Share of outsider top members <i>(with less than 1 year tenure in the same bank)</i>	1						
Dummy for female presence on boards	-0.0234	1					
Age	-0.1615	-0.067	1				
Tenure	-0.4357	0.086	0.2623	1			
Family affiliation	-0.018	0.0188	0.0704	0.0196	1		
BA degree	0.0192	-0.0063	0.3568	-0.1076	0.0917	1	
Sizeboard	0.0304	0.1934	0.4071	-0.023	-0.0166	0.2771	1

(1) Correlation among variables in the panel of Italian banks during the period 1995-2010.

Table a8 – Effects of gender diversity on bank riskiness and performance:
IV panel estimation controlling for board characteristics (1)

<i>Dependent variables</i>	<i>Riskiness indicators</i>			<i>Performance indicators</i>			
	<i>Riskbank index : Bad loans on total loans</i>	<i>Default rate: New bad loans on lagged performing loans</i>	<i>Impairment index: Net credit impairments on total loans</i>	<i>Profitability index (ROA): Gross profit on total assets</i>	<i>Cost-efficiency index: Operating costs on income margin</i>	<i>Capital ratio: Capital and reserves on total assets</i>	
Dummy for “at least a woman in bank boards” (Lag2)	-0.972 [1.920]	-0.833 [0.616]	-0.572* [0.338]	1.441*** [0.463]	-1.292 [6.416]	-0.702 [1.398]	
Lag1 Sizeboard	-0.006 [0.013]	0.007* [0.004]	0.001 [0.002]	-0.002 [0.003]	0.083* [0.043]	0.036*** [0.010]	
Lag1 (mean) Age	0.049 [0.040]	-0.002 [0.012]	-0.003 [0.007]	0.028*** [0.010]	-0.149 [0.135]	-0.002 [0.029]	
Lag1 Share of membership in family banks	-1.714 [7.467]	5.335** [2.239]	2.035* [1.162]	-3.911** [1.848]	9.229 [25.433]	-13.464** [5.758]	
Lag1 Share of membership with a BA degree	-0.101 [0.464]	-0.415*** [0.146]	-0.064 [0.069]	-0.151 [0.115]	-1.554 [1.585]	0.31 [0.365]	
Lag1 Sizebank (log. total assets)	1.470*** [0.173]	0.214*** [0.055]	0.115*** [0.026]	-0.434*** [0.048]	-4.652*** [0.654]	-3.461*** [0.120]	
Lag1 Ceffbank (operating costs/income margin)	-0.014*** [0.003]	-0.005*** [0.001]	-0.002*** [0.000]	-0.008*** [0.001]		-0.001 [0.003]	
Lag1 Roabank (gross profit/total assets)	-0.911*** [0.058]	-0.146*** [0.019]	-0.057*** [0.009]		-4.729*** [0.186]	-0.032 [0.047]	
Lag1 Indcap (capital & reserves/total assets)	0.041*** [0.014]	0.024*** [0.005]	0.003 [0.002]	-0.026*** [0.004]	0.059 [0.055]		
Lag1 Riskbank (bad loans/total loans)				-0.011*** [0.003]	0.167*** [0.040]	0.063*** [0.009]	
Bank fixed effects	YES	YES	YES	YES	YES	YES	
Dummy year	YES	YES	YES	YES	YES	YES	
Observations	10,162	9,592	10,233	9,960	9,962	10,044	
			First stage				
Lag2 Share outsider members	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	
F test - 1 st stage	34.65***	29.33***	25.96***	36.51***	36.18***	39.62***	

(1) Panel of banks in the period 1995-2010. 2SLS estimations with bank fixed effects. Standard errors are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table a9 – Effects of gender diversity on bank riskiness and performance:
IV panel estimation controlling for board size (1)

<i>Dependent variables</i>	Riskiness indicators			Performance indicators		
	<i>Riskbank index : Bad loans on total loans</i>	<i>Default rate: New bad loans on lagged performing loans</i>	<i>Impairment index: Net credit impairments on total loans</i>	<i>Profitability index (ROA): Gross profit on total assets</i>	<i>Cost-efficiency index: Operating costs on income margin</i>	<i>Capital ratio: Capital and reserves on total assets</i>
Dummy for “at least a woman in bank boards” (Lag2)	-1.467 [1.597]	-0.860* [0.511]	-0.548** [0.269]	1.154*** [0.363]	0.096 [5.274]	-0.606 [1.168]
Lag1 Sizeboard	-0.006 [0.013]	0.006* [0.004]	0.001 [0.002]	-0.003 [0.003]	0.086** [0.043]	0.037*** [0.010]
Lag1 Sizebank (log. total assets)	1.540*** [0.161]	0.212*** [0.050]	0.110*** [0.023]	-0.386*** [0.040]	-4.874*** [0.576]	-3.465*** [0.110]
Lag1 Ceffbanc (operating costs/income margin)	-0.014*** [0.003]	-0.005*** [0.001]	-0.002*** [0.000]	-0.008*** [0.001]		-0.001 [0.003]
Lag1 Roabanc (gross profit/total assets)	-0.915*** [0.057]	-0.145*** [0.019]	-0.056*** [0.008]		-4.709*** [0.183]	-0.031 [0.046]
Lag1 Indcap (capital & reserves/total assets)	0.043*** [0.014]	0.024*** [0.005]	0.002 [0.002]	-0.024*** [0.004]	0.053 [0.054]	
Lag1 Riskbank (bad loans/total loans)				-0.011*** [0.003]	0.169*** [0.039]	0.063*** [0.009]
Bank fixed effects	YES	YES	YES	YES	YES	YES
Dummy year	YES	YES	YES	YES	YES	YES
Observations	10,162	9,592	10,233	9,960	9,962	10,044
				First stage		
Lag2 Share outsider members	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]	0.001*** [0.000]
F test - 1 st stage	49.86***	42.36***	40.00***	53.29***	52.84***	55.99***

(1) Panel of banks in the period 1995-2010. 2SLS estimations with bank fixed effects. Standard errors are in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.