



Women on boards: The superheroes of tomorrow? ☆



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ABSTRACT

Can female directors help save economies and the firms on whose boards they sit? Policy-makers seem to think so. Numerous countries have implemented boardroom gender policies because of business case arguments. While women may be the key to healthy economies, I argue that more research needs to be done to understand the benefits of board diversity. The literature faces three main challenges: data limitations, selection and causal inference. Recognizing and dealing with these challenges is important for developing informed research and policy. Negative stereotypes may be one reason women are underrepresented in management. It is not clear that promoting them on the basis of positive stereotypes does them, or society, a service.

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Introduction

Boards hire and fire the CEO; they advise and monitor the CEO. They are to blame when things go wrong; they sometimes get credit when things go right. They are ultimately responsible for ensuring corporations create value for their stakeholders. So the burning question is: what makes a board effective?

For many years policy-makers and governance academics thought the answer to this question was “independence”. An independent board is a board that exhibits enough collective independence of thought that it will question management when necessary. While independence is theoretically appealing, it is difficult to measure in practice. Most regulations and most research define an independent board as a board that is comprised primarily of members without measurable conflicts of interest with management. A director who has no family ties with the CEO, does not provide consulting or other services to the company and has not invited the CEO to his own board is typically considered independent.

The lack of evidence that conventional measures of board independence matter (Adams, Hermalin, & Weisbach, 2010; Hermalin & Weisbach, 2003) led many to argue that independent boards are ineffective if they are dominated by the “Old-Boys’ Club”. For example, the 2003 Higgs and Tyson reports, commissioned by the UK government in response to a series of corporate scandals in the early 2000s, argue that boards should cast a wider net when recruiting directors. Since women, by definition, are not part of the Old Boys’ Club, it is natural to ask whether more gender diverse boards would be more effective and, if so, whether women are sufficiently represented on boards.

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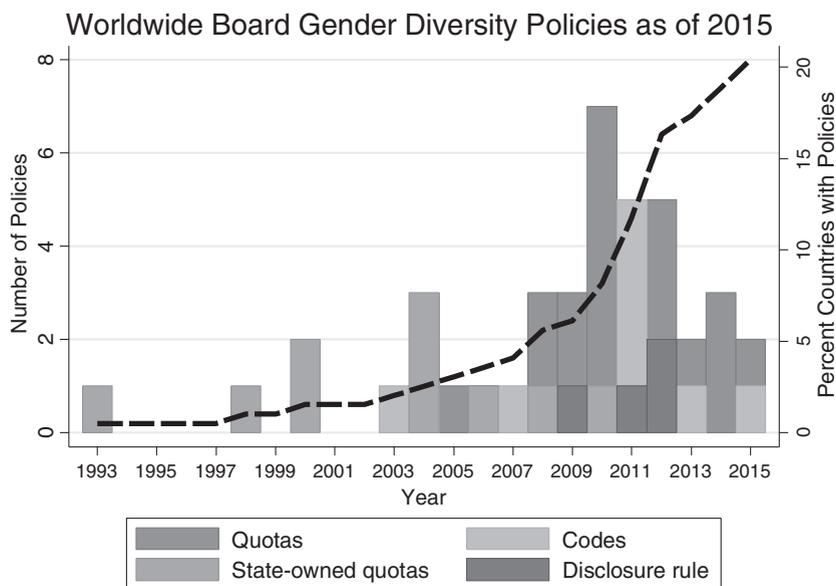


Fig. 1. Current boardroom diversity policies for listed companies. Fig. 1 is an updated version of Figure I in Adams and Kirchmaier (2015a). It displays the number of boardroom gender policies enacted in each year since 1993. The dashed line indicates the percentage of countries with boardroom gender policies. The number of countries used as the benchmark for calculating percentages is 196.

Policy-makers clearly believe that the answer to the first question is yes and the answer to the second question is no. As a result, board gender diversity has become a hot topic for policy-making. As Fig. 1 illustrates, between 2008 and 2015 32 countries implemented 42 boardroom diversity policies in the form of legal quotas for listed or state-owned firms (8 and 5 countries respectively), governance code amendments (26 countries), and disclosure requirements (4 countries).¹ In 2012, the European Union approved a draft law that sets an objective of 40% female nonexecutive directors on boards of listed firms across the 28 member states of the EU (European Commission, 2012a). If passed, the EU law will apply to 5000 out of the 7500 listed firms in the EU (European Commission, 2012b). Even though strong parliamentary support for the draft law suggests that it may be passed (European Commission, 2014), in March 2015 Germany preempted the passage of the EU law by adopting a bill mandating a 30% board gender quota for large listed firms.

Most policy-makers justify their intervention by appealing to the “business case” argument that firms with more women on boards perform better. For example, in its 2012 proposal for a directive on improving the gender balance among non-executive directors of listed firms, the European Commission states (European Commission, 2012a, p. 5): “The proposed Directive will lead to breaking down the barriers that women face when aiming for board positions and to improved corporate governance, as well as enhanced company performance.”

The benefits of female directors are not supposed to be limited to the firms on whose boards they sit. The European Commission (2012a, p. 3) states: “The under-utilisation of the skills of highly qualified women’s [sic] constitutes a loss of economic growth potential. Fully mobilising all available human resources will be a key element to addressing the EU’s demographic challenges, competing successfully in a globalised economy and ensuring a comparative advantage vis-à-vis third countries.” If the boards of listed firms in Europe become more gender diverse, the EU argues that it can achieve higher, sustainable rates of economic growth (European Commission, 2012b).

Can female directors really save the world—or at least the corporations on whose boards they sit? Some evidence suggests that the answer is yes. In making the “business case” argument, many boardroom diversity policies cite studies by Catalyst (2007), McKinsey (2007) and Credit Suisse (2012), among others, that show firms with more boardroom diversity perform better. For example, the European Commission (2012a) and the Australian Securities Exchange Corporate Governance Council (ASX, 2010) cite Catalyst (2007) in making their economic arguments for boardroom diversity policies. Catalyst (2007) shows that Fortune 500 firms in the top quartile of board gender diversity (measured by the percentage of women on the board) outperform the bottom quartile of Fortune 500 firms in terms of return on equity, return on sales and return on invested capital. McKinsey (2007), also cited in the European Commission’s (2012a) proposal, shows similar results for large European firms.

¹ As of 2015, Austria, Denmark, Greece, Finland, Iceland, Ireland, Israel, Kenya, Poland, Slovenia, South Africa, Switzerland and United Arab Emirates have quotas for state-owned firms. Belgium, France, Iceland, India, Italy, Malaysia, Netherlands, Norway, Spain and Germany have quotas for listed firms. Israel may also be considered to have a listed-firm quota although it is minimal. Albania, Austria, Belgium, Denmark, Finland, France, Germany, India, Italy, Japan, Jordan, Kenya, Malawi, Morocco, The Netherlands, Norway, Pakistan, Poland, Romania, Singapore, Slovenia, Spain, Sweden, Switzerland, Thailand, Trinidad and Tobago, Turkey and the UK have governance codes with specific recommendations for nominating committees to consider gender diversity. Australia, Denmark, New Zealand and the USA have disclosure requirements for listed firms.

But these studies are produced by consulting companies, not academics. Thus, they are not held to the high methodological and peer review standards that academic work is subject to. Given the magnitude and popularity of the recent policy interventions concerning boardroom diversity and the expectations placed on female directors and the boards they sit on, it is important to review the scientific evidence on female directors and gender-diverse boards. A better understanding of the state of the literature can help inform policy and shape expectations about the impact of boardroom diversity policies on corporate and economic outcomes.

While interest in their potential performance-enhancing powers is one reason to study and learn about female directors, there are many other reasons. Because a directorship is one of the highest corporate leadership positions, a woman's presence (or absence) on boards is informative about her career progression and the factors that led her to stay in or drop out of the workforce. Because directors do not act alone, but as teams, diversity on boards can also inform our knowledge about how teams operate.

One cannot study boardroom gender diversity if there are no women on boards. Due to data limitations there is much we still do not know—especially about career progression and team dynamics. In my review, I describe some of what we know—with a particular focus on issues that are relevant for the current policy debate—but also point out what we do not know. In doing so, I focus primarily on the Finance and Economics literature on board diversity. It is my view that this literature has been the most serious about trying to disentangle causal effects of boardroom gender diversity.²

To understand whether correlations between corporate outcomes and board diversity are causal, one must address what the Economics literature calls “endogeneity” problems. Technically, an endogeneity problem arises when the variable of interest in a regression is correlated with the error term. What this means is that the coefficient on the variable of interest cannot be interpreted as capturing the effect of that variable alone. Instead, there are confounding factors. In extreme cases the confounding factors are the only reason the correlation between the variable of interest and the outcome appears to be non-zero. Since we can never be sure when these extreme cases arise, it is imperative to take steps to address the problem.

Endogeneity is a concern when there are omitted variables, reverse causality and measurement error. The regression of firm performance on board gender diversity that underlies the “business case” argument is a classic example of a regression that is likely to suffer from all three endogeneity problems. For example, as I show in the section called “The (uncertain) facts about female board representation”, women are more likely to sit on the boards of large firms. But we also know that large firms perform differently than small firms. If we do not properly account for firm size, correlations between diversity and corporate outcomes will also reflect correlations with firm size. In this case, the magnitudes of the correlations suffer from “omitted variable bias” and it may be difficult to determine the magnitude of the causal effect of diversity.

To illustrate this and other points about endogeneity, it is useful to look at some data. I use Adams and Ferreira's (2009) sample of Riskmetrics board data on unregulated S&P 1500 firms for the period 1996–2003. The Appendix shows summary statistics and a correlation matrix for return on equity (ROE), the fraction of women on the board, log(sales), board size, the fraction of independent directors and the number of business segments.

Following Catalyst (2007), I examine how ROE varies as the fraction of women on the board increases.³ In column I of Table 1, I regress ROE on the fraction of women. The coefficient is positive and statistically significant at the 1% level. The coefficient suggests that a one standard deviation increase in the fraction of women (8.3%) is associated with a 23.02% increase in ROE. This correlation goes in the same direction as in Catalyst (2007) but the magnitude is smaller, presumably because this sample contains smaller firms than Catalyst's Fortune 500 sample.⁴

In column II, I add log(sales) (a proxy for firm size) to the regression. It is immediately apparent that the coefficient in column I was driven in large part by omitted variable bias. After adding log(sales), the magnitude of the coefficient on the fraction of women decreases by roughly 75% and is no longer statistically significant. In contrast, log(sales) is positive and significant at greater than the 1% level. Since different industries are likely to exhibit different patterns of board diversity, I add 2-digit SIC industry dummy variables to the regression in column III. The coefficient on the fraction of women is still statistically insignificant and the magnitude drops by roughly another 40%.

This simple example illustrates how important addressing endogeneity is. Since the coefficient on the fraction of women in column I captures not only the effect of diversity, but also the effect of firm size and other variables, it would be misleading to use the results in column I to argue that changes in diversity lead to large increases in ROE. The example also illustrates that conclusions can easily change after addressing endogeneity. Once I add a proxy for firm size to the model to address endogeneity due to omitted variables, the coefficient on the fraction of women becomes statistically indistinguishable from zero. While controlling for firm size may not have the same effect in other samples, the fact that it has such a big effect in a reasonable sample of data on S&P 1500 firms should be cause for concern.

Reverse causality is another important source of endogeneity in the diversity and performance relationship because the match between boards and women is likely to be a function of firm and individual characteristics. This means any correlation between corporate outcomes and board diversity can be interpreted as reflecting the effect of diversity on outcomes as well as the effect of outcomes on diversity. In performance regressions, for example, the coefficient on gender diversity reflects both a causal effect of diversity on performance (which can be positive, zero or even negative) and a causal effect of performance on diversity.

² Antonakis et al. (2010; 2014) deplore the state of causal identification in leadership studies.

³ Because ROE exhibits some extreme outliers I drop observations with ROE in the first and 99th percentiles. I also drop observations for which I do not have complete data on log(sales), board size, the fraction of independent directors and the number of business segments. Results are similar if I do not require data on all controls to be available for all regressions. Results are also similar if I use the average of this and last year's Total Common Equity in calculating ROE to help eliminate outliers instead of dropping observations with extreme values.

⁴ Catalyst (2007) documents a 53% increase in ROE for a 4.8% increase in the percentage of female directors in a sample of Fortune 500 firms.

Table 1

Example following Catalyst: the relationship between ROE and fraction female directors.

The sample is from Adams and Ferreira (2009). It consists of an unbalanced panel of data on unregulated S&P 1500 firms for the period 1996–2003 from Riskmetrics (formerly IRRC), Compustat and CRSP. ROE is defined as Net Income Before Extraordinary Items and Discontinued Operations divided by Total Common Equity. I drop observations with ROE in the first and 99th percentiles. I also drop observations for which I do not have complete data on log(sales), board size, the fraction of independent directors and the number of business segments. Riskmetrics classifies directors as independent if they have no business relation with the firm, are not related or interlocked with management, and are not current or former employees. The sample contains 9188 observations. Standard errors are clustered at the firm level.

Variables	Dependent variable: ROE				
	I	II	III	IV	V
Fraction female directors	24.519*** [6.301]	6.242 [1.639]	3.617 [0.914]	−23.953*** [−3.875]	−8.837 [−1.448]
Log(Sales)		3.136*** [11.138]	3.244*** [10.471]	3.239*** [3.247]	8.137*** [5.936]
Board size					−0.658*** [−3.467]
Fraction independent directors					5.526** [2.252]
# Business segments					−0.160* [−1.938]
Constant	6.781*** [14.897]	−14.384*** [−6.937]	−5.800 [−1.051]	−12.629* [−1.761]	−40.545*** [−4.291]
Observations	9188	9188	8980	9188	9188
Fixed effects	None	None	Industry	Firm	Firm and year
Adjusted R-squared	0.0106	0.0589	0.0925	0.00763	0.0640

*** Indicates $p < 0.01$.

** Indicates $p < 0.05$.

* Indicates $p < 0.1$.

Performance can causally affect board diversity if women choose to join the boards of better performing firms or if better performing firms choose to have more female directors.

The best way to solve endogeneity problems is to conduct experiments. If the variable of interest is randomly assigned, it cannot be correlated with the error term and outcomes will be causally determined by that variable. But in some cases experiments are neither possible nor credible. For example, to experimentally identify the causal effect of gender diversity on firm performance, one would have to randomly assign female directors to firms and then measure subsequent firm performance. Even if one could conduct such an experiment, one would have to worry about selection into the experiment. The firms and women who might agree to participate would probably be so different from the general population that the results would not be generalizable (see the discussion of this problem in Levitt & List, 2007).

But just because experiments are not feasible does not mean one has to, or should, give up. The Economics and Finance literature has well-developed tools to deal with endogeneity problems. As Antonakis, Bendahan, Jacquart, and Lalive (2010; 2014) point out in their primers on causal identification in leadership studies, using these tools does not require a technical background. Even if endogeneity problems cannot be completely eliminated with these methods, researchers can combine them with theoretical arguments to make a solid case for the direction of causality or to put bounds on the magnitudes of coefficients.

In panel data settings, firm fixed effects can be used to address omitted variable bias when the omitted variables cannot be as easily measured as firm size in the example above. Corporate culture and workplace practices are two examples of firm-level variables whose omission may bias the diversity-performance relationship, but that may be difficult to measure. With repeated observations, one can subtract out mean values from variables (via fixed effect estimators) in order to eliminate fixed differences in corporate culture or workplace practices across firms. While fixed effect estimators only eliminate time invariant omitted variable bias, it is usually reasonable to assume that corporate culture does not change in most existing samples on boards in the literature.

In Table 1, I show the importance of controlling for omitted factors using firm fixed effects. In column IV I add firm fixed effects to the regression in column II. The coefficient on the fraction of women is now negative and significant at the 1% level. The result suggests that the reason the fraction of women is positively correlated with ROE in column II is because firms with better corporate culture and workplace practices perform better and also have more female directors. After stripping out the culture effect, the relationship between diversity and performance is negative. Of course, the model is still fairly simplistic. Column V reports the results after adding board size, the fraction of independent directors, the number of business segments and year fixed effects to the model. The coefficient on the fraction of women is still negative but no longer significant. One might have theoretical reasons to choose the model in column V, but even these results are not entirely credible because they still suffer from endogeneity due to reverse causality.

To eliminate reverse causality in this setting one could use the instrumental variable (IV) technique. This technique purges the endogenous variable, the fraction of female directors, from its correlation with the error term using a variable, the instrument, which is outside the regression model but correlated with the fraction of female directors. To implement IV one obtains the predicted values of the fraction of female directors on the instrument and all control variables from the regression model and uses them in place of the fraction of female directors in the original model. Since the standard errors need to be corrected after substituting out the original variable of interest, one usually uses preprogrammed IV commands instead of doing this two stage method oneself. While IV is straightforward to implement, it is challenging to identify instruments that are outside the model.

Another way of addressing reverse causality is to use a “natural experiment” together with difference-in-difference estimators. A natural experiment is any type of shock that creates random variation in the variable of interest. It is called “natural” because it does not take place in a laboratory. Some board diversity policies can be used as natural (or quasi-natural) experiments. For example, board quotas can break the link between firm characteristics and board diversity, which means it is easier to interpret correlations between diversity and corporate outcomes in terms of the effect of diversity on outcomes. Difference-in-difference analyses account for both cross-sectional heterogeneity and time trends by comparing what happens to “treated groups”, e.g. firms subject to quotas, to “control groups”, e.g. firms not subject to quotas, before and after the “treatment”, e.g. the passage of the quota.

Addressing causality concerns is hard. Even though the tools are well-developed, they rely on important assumptions that often do not hold in practice. But even if the tools are not perfect, using them helps shape our thinking. Understanding causality is always important, but it is particularly important in this debate. Many argue that one reason why women are relatively under-represented on boards is because of negative stereotypes, for example about women’s leadership style or their preferences. If we do not try to identify causal effects, we are in danger of perpetuating further stereotypes about women. While some stereotypes may seem to work to women’s advantage, e.g. the stereotype that female directors have performance-enhancing powers by virtue of their gender or the possible stereotype that they are more risk-averse than men, they can also create unrealistic expectations for women. I believe women (and society) are better served if we put wishful thinking aside and try to uncover the facts about boardroom diversity in the most careful and rigorous manner possible.

Because the credibility of empirical work depends to a large extent on the quality of the data, in the review that follows I start by providing some facts concerning women’s representation on boards. This illustrates the limitations of the data on board diversity. It is also important for understanding the motivation for policy intervention. I then turn to the question of whether male and female directors are different other than in their gender. Some argue that women must be like men to reach the top of the corporate ladder. If so, boardroom diversity should have no effect on corporate or economic outcomes. Next I discuss reasons why few women reach the top. Only then do I examine the question of whether boardroom gender diversity leads to better corporate performance. Although this topic is the subject of much of the earliest and most well-known literature on board diversity, I discuss it towards the end of my review because I believe some of the more recent work is important for understanding the “business case” argument and the reasons why it may break down.

The (uncertain) facts about female board representation

Catalyst started surveying the representation of women on boards of Fortune 500 companies in 1993. In 2003, the European Commission created its “gender-balance in decision-making” database which provides annual data on the representation of women on the boards of the 50 largest companies on the major exchanges in each EU country. This data fed into the first McKinsey (2007) “Women Matter” survey. Numerous other surveys exist. Even though the composition of the firms and countries in their samples differs, they all have the same message: women are relatively underrepresented on boards in numeric terms.

The mere fact that the numbers in these surveys did not look good served as a catalyst for policy. For example, the European Commission starts its 2012 proposal (European Commission, 2012a) for its directive on improving the gender balance on boards as follows “Company boards in the EU are characterized by persistent gender imbalances, as evidenced by the fact that only 13.7% of corporate seats in the largest listed companies are currently held by women (15% among non-executive directors).” The source for the numbers is the European Union’s “gender-balance in decision-making” database.

While they can be credited with pushing policy-makers to do something, policy-makers may have become too dependent on these surveys to justify policy and to chart the progress of their initiatives.⁵ Missing from the policy debate is a discussion of what “underrepresentation” means, for example. This is important for understanding where the problems lie and, presumably, what the proper objective of policy should be. Just because women are numerically less represented than men does not mean they are “underrepresented” in the sense that they are discriminated against. If one in five male executives becomes a board member and one in five female executives becomes a board member, but there are few women on boards, then the problem is not with the boards, but with the pipeline of executives.

Also missing from the debate is a discussion of how to measure board diversity. All surveys measure diversity as the sample average of the percent or fraction of women on the boards of the individual firms in the survey. While this measure is intuitive, it may change even when the numbers of men and women serving as directors stay the same. If female directors receive more directorships than male directors do, for example, then this diversity measure may increase even though no new women have entered the director pool (the set of individuals who serve as directors). If expansion of the female director pool is a desirable policy objective, the composition of the director pool needs to be measured directly.

While in the early 90s the Catalyst surveys provided hand collected data that was not easily available otherwise, as academics we now have access to datasets that allow us to get a more nuanced picture of the representation of women on boards and over time. Some of the most popular datasets are Riskmetrics with data on S&P 1500 firms from 1996 onwards and Boardex with data on boards in over 90 countries from the early 2000s onwards. One advantage of Boardex is its extensive coverage for some countries, especially in more recent years. For the US, Riskmetrics covers roughly 1500 firms a year, while Boardex covers more than

⁵ For example, a 2014 factsheet (European Commission, 2014) with the title “Gender balance on corporate boards: Europe is cracking the glass ceiling” states “In April 2014, the average share of women on the boards of the largest publicly listed companies registered in the EU-28 Member States reached 18.6%. This represents a rise of 0.8 percentage points since the last data collection in October 2013 (17.8%).”

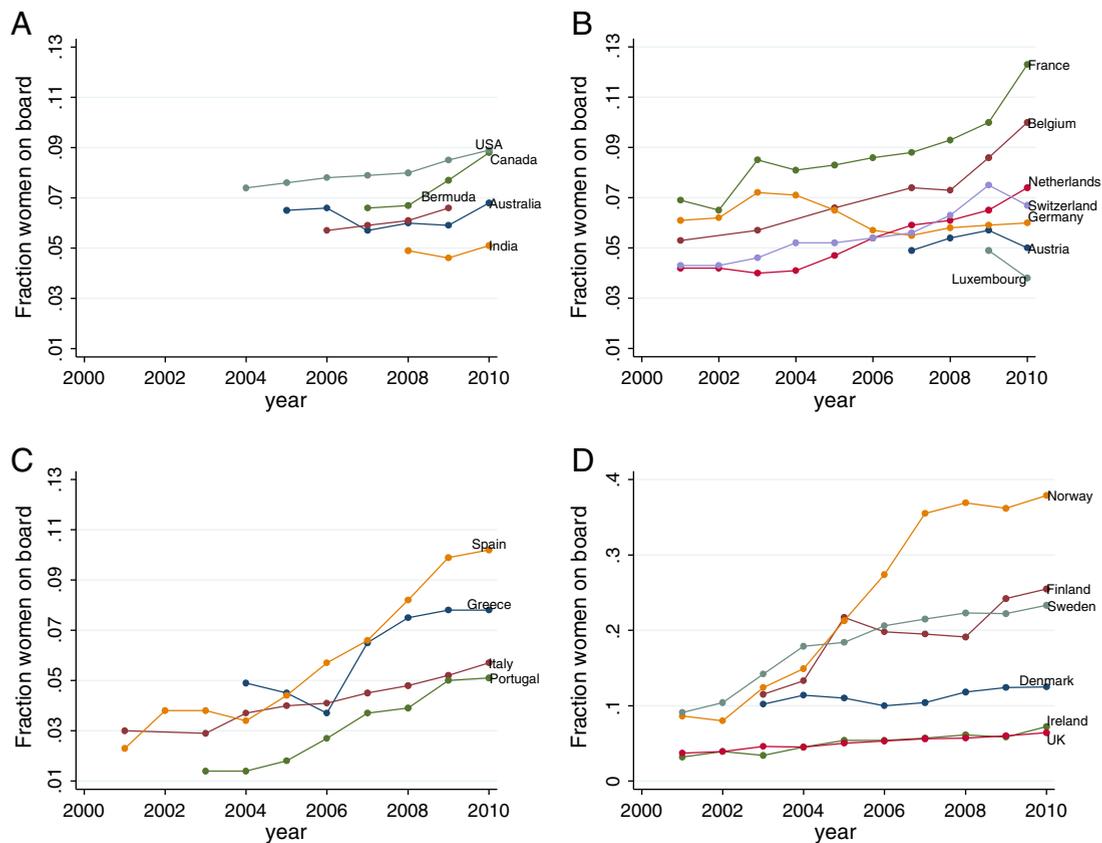


Fig. 2. Trends in board diversity across countries. Fig. 2 shows trends in board diversity for 22 countries using data from Adams and Kirchmaier (2015a), Appendix Table A.1. Adams and Kirchmaier's (2015a) base sample is Boardex data from 2001 to 2010. Financial firms and utilities are excluded. Board diversity is the fraction of women on the board. In companies with dual boards, the management board and the supervisory boards are combined. Data for Australia, Bermuda and Canada is dropped in years 2004, 2005 and 2006, respectively, because the number of companies is roughly half the numbers in subsequent years. Panel A is for the countries outside of Europe in their sample. Panels B, C and D show data for the Western, Southern and Northern European countries in their sample. Regional classifications are done according to the United Nations Statistics Division—Standard Country and Area Codes Classifications. The y-axis scale is common for all graphs except panel D.

twice as many firms since 2004. As Adams and Kirchmaier (2015a, 2015b) show, and as I illustrate below, coverage matters for understanding the representation of women on boards.

To illustrate general patterns in female board representation, I combine data from Adams and Kirchmaier (2015a, 2015b) with data from the European Union's "gender balance in decision-making" database and Catalyst's data on board diversity in Fortune 500 companies (2013). Adams and Kirchmaier's (2015a, 2015b) base sample is Boardex data on unregulated firms from 2001 to 2010. They impose the requirement that firms in a country can only enter the sample if the sum of their market capitalizations is at least 70% of the total market capitalization of that country in that year. They impose this requirement to ensure that Boardex's coverage can be considered to be representative for that country and year. They also require a country to enter the sample in more than one year. They end with a sample of data from 22 countries from 2001 to 2010 with varying coverage over time.

Companies in the EU database consist of the largest 50 members of the primary blue-chip index in each country that are registered in the country. As most blue-chip indexes have fewer than 50 members, the number of companies that enter the calculations in the 2003–2014 version of the database is smaller than 50 in 92.32% of country-years. The mean number of companies per year is 20.98.

In Fig. 2 panels A–D, I plot the average fraction of women on the board for each country and year from Adams and Kirchmaier (2015a) Appendix Table A.1.⁶ Panel A is for the countries outside of Europe in their sample. Panels B, C and D show data for Western, Southern, and Northern European countries in their sample. I divide countries into regions using the United Nations Statistics Division—Standard Country and Area Codes Classifications (<http://www.unstats.un.org/unsd/methods/m49/m49regin>).

⁶ Adams and Kirchmaier (2015a) define the fraction of women on the board to be the number of female directors divided by board size. In countries with dual boards (Austria, Germany, Denmark, Netherlands) or dual-board firms in countries that allow firms to choose a dual board structure (France, Greece, Italy, Luxembourg, Portugal, Switzerland), board size is the number of supervisory board members plus the number of management board members. In dual board firms, the European Commission defines the fraction of women on the board to be the number of female directors divided by supervisory board size.

htm#europe). Fig. 2 shows that the trend in board diversity is generally upward, but there is significant variation in both the levels and growth rates across countries. For comparison purposes, in Fig. 3 I plot the data for the countries that have the highest level of diversity in 2010 in the four panels of Fig. 2: USA, Norway, France and Spain. On a bigger scale, the upward trends look far less impressive for countries other than Norway.

In panel A of Fig. 4, I plot data on board diversity over time for the USA from Catalyst (2013) and Adams and Kirchmaier (2015a). In panel B I plot data for the UK from the EU's gender balance database and Adams and Kirchmaier (2015a). The differences in the numbers are striking. In both panels, the numbers from Adams and Kirchmaier are substantially lower than the Catalyst or EU numbers. What explains the difference? Firm size. Adams and Kirchmaier's sample includes many more firms than Catalyst's or the EU's samples. The Catalyst data is for at most 500 of the largest firms in the USA every year and the EU data is for at most 50 of the largest firms in the UK every year. Adams and Kirchmaier's sample covers between 3298 and 4566 firms in the USA and between 447 and 1323 firms in the UK every year. Because Adams and Kirchmaier's sample is bigger, it contains many more small firms. More research needs to be done on the reasons why women are less represented on the boards of small firms, but the evidence that this is the case is clear. What is also clear is that women are much less represented than we think they are.

Adams and Kirchmaier (2015a) also use their data to construct a country-level measure of the representation of women in the director pool—in this case the set of individuals who serve as directors of any firm in a country in a given year. They call this measure “director participation” because, like female labor force participation measures, it counts each individual only once in a given year. The numerator is the number of unique women serving as directors of any firm and the denominator is the number of unique individuals, male or female, serving as directors. Typical diversity measures calculate the percentage of women on the board for each firm and then average this number across firms in a country. While each woman counts only once at the firm level, she can count multiple times in the average if she has multiple board seats.

A simple example can help illustrate that counting the same woman (or man) more than once can make a big difference. Suppose there are 2 boards—one with 4 directors and one with 5 directors. If each board has 1 woman, then the fraction of women on the first board is 0.25, the fraction of women on the second board is 0.2 and diversity is the mean of the two numbers, 0.225. Suppose first that the same woman sits on both boards but the men on each board are different, i.e. the woman holds 2 board seats and the men only hold one each. In this case, there are 7 male directors and 1 female director and director participation is $1/8 = 0.125$, a much lower number than 0.225. Now suppose that the female board seats are held by two different women and no director has more than one seat. In this case, director participation is $2/9 = 0.222$ and is close to being equal to diversity. As this simple example illustrates, by focusing on average changes at the firm level diversity measures may not capture new entry of women into the director pool.⁷

The differences between diversity and participation can be large. For the USA, the average difference between Catalyst's diversity measure and director participation is 6.5%. For the UK, the average difference between EU diversity and director participation is 6.9%. But the differences between director participation and diversity become much smaller when using a comprehensive sample like in Adams and Kirchmaier (2015a) to calculate diversity. Nevertheless, as Fig. 5 shows, relative to director participation, there are still sizeable gaps between diversity and participation. Moreover, it is not clear that the two measures always converge as diversity increases. In Norway, for example, average diversity is initially lower than participation but after the end of 2005, when Norway gave public limited liability companies two years to gender-balance their boards, it is greater.

Figs. 3–5 illustrate the limitations of the data that are currently used in the board diversity discussion. Even basic facts about female board representation can vary with the dataset and the measurement technique used. This suggests that the distribution of female directorships varies across firms and individuals. More research needs to be done to understand why this is the case and what the implications are for firms and society. More attention might also need to be paid to measurement. It makes sense to examine firm-level outcomes using firm-level diversity, as the literature has to date. But with country-level measures one can examine whether society as a whole benefits from diversity policies, e.g. through higher growth, something the literature has not yet done directly. A step in this direction is Bertrand, Black, Jensen, and Lleras-Muney (2014) who show that the Norwegian quota did not appear to affect labor market outcomes for women. While their evidence suggests that the Norwegian quota may not have an impact on growth, much more work needs to be done on this topic.

The case for board diversity

There is no case for board gender diversity if female directors are very similar to male directors in terms of their skills, experiences, and preferences. While the literature documents that female and male directors have different characteristics, some of these differences are likely to vanish over time. For example, female directors tend to be younger than male directors (e.g. Adams & Ferreira, 2009; Adams & Funk, 2012; Ahern & Dittmar, 2012). They may also be less likely to be members of the “old boys club” (Higgs, 2003; Tyson, 2003). As women obtain more board seats, the pool of female directors is likely to age and women may also become members of the “old boys club”. If the benefits of board diversity derive only from these differences, it would be hard to make a case for its importance in the long run.

⁷ Holding more board seats alone does not explain differences between director participation and diversity. Except in simple examples, it is not easy to determine the relation between the two measures. The reason is that firm-level board size plays a role in calculating diversity but not in participation. Even if women hold more board seats than men, as in e.g. Canada, the U.K and the U.S. (Adams and Kirchmaier, 2015a), participation may be higher than diversity if firms tend to have relatively large boards. This is another reason why diversity measures can be misleading. Diversity can change both because the numerator (the number of female directors) changes as well as because the denominator (board size) changes.

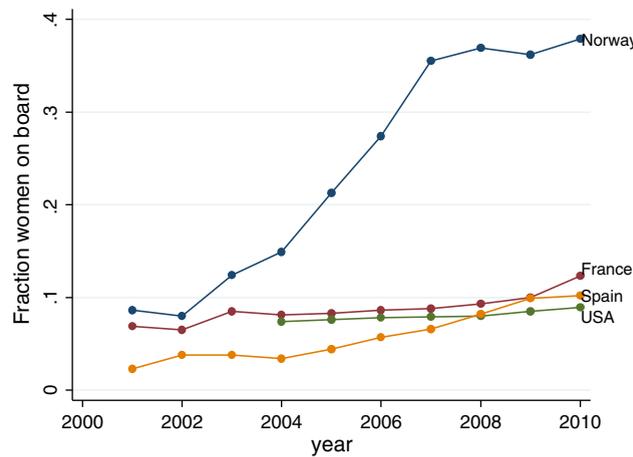


Fig. 3. Comparing board diversity trends for the countries with the greatest board diversity in 2010. Fig. 3 shows trends in board diversity for the countries with the highest board diversity in 2010 in each of panels A–D of Fig. 2 on a common scale.

There is a stronger case for board diversity if female directors are different from male directors in ways that are unlikely to change much over time, for example in their preferences. There is a large literature on gender differences in preferences (e.g. [Bertrand, 2010](#)). This literature provides evidence that women are more risk-averse (see the surveys in [Byrnes, Miller, & Schafer, 1999](#), and [Croson & Gneezy, 2009](#)), have less of a taste for competition (e.g. [Niederle, 2014](#)), and are more other-regarding than men (e.g. [Eagly, Diekmann, Johannesen-Schmidt, & Koenig, 2004](#) and [Pratto, Stallworth, & Sidanius, 1997](#)). If director gender gaps in preferences are the same as “typical” gender gaps, then it is plausible that increasing board diversity may lead to different and potentially better board dynamics and decision-making. For example, if female directors are more risk-averse than male directors, it is plausible that greater board diversity can lead to less risky corporate outcomes. This argument is the basis for [Kroes's \(2009\)](#) famous “Lehman Sisters” hypothesis that the crisis would not have happened the way it did if Lehman Brothers had been Lehman Sisters (see also [Bennhold, 2009](#)). This argument is also the basis for the addition of targets for the underrepresented gender in the management body in the [European Commission's \(2014\)](#) Capital Requirement Directives for financial institutions (CRD IV).

Most of the evidence on female directors' preferences is indirect. Several papers relate corporate outcomes to CEO gender or board gender diversity and argue that their results are consistent with lower female overconfidence, greater female risk-aversion or greater other-regarding preferences at the executive level. For example, [Huang and Kisgen \(2013\)](#) relate acquisition and financing decisions of unregulated S&P 1500 firms from 1993 to 2005 to the gender of the CEO or CFO. They include CFO data as the sample of observations on female CEOs is too small for meaningful analysis. To address endogeneity problems they mimic a “difference-in-difference” strategy by comparing what happens before and after male to female executive transitions (116 cases, 19 of which are for female CEOs) to what happens before and after male to male executive transitions (1750 cases). They also run firm fixed effects specifications in a panel setting and conduct instrumental variable analyses with a state-level gender equality index as an instrument. They find asset growth, the likelihood of making acquisitions, leverage and debt issuance are all lower in the male to female transition firms.

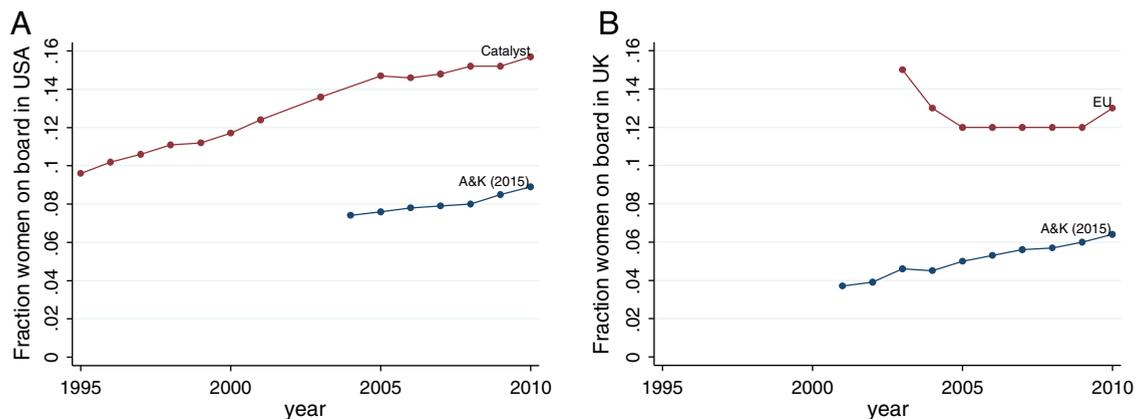


Fig. 4. Comparing boardroom diversity numbers across different samples. Panel A plots board diversity over time for companies in the USA from [Catalyst \(2013\)](#) and [Adams and Kirchmaier \(2015a\)](#) (see Fig. 2). The Catalyst data is for Fortune 500 companies. Panel B plots board diversity over time for companies in the UK from the European Union's gender balance in decision-making database in 2014 and [Adams and Kirchmaier \(2015a\)](#). Companies in the EU database consist of the 50 largest members of the primary blue-chip index in each country that are registered in the country. Panel A: Board diversity USA. Panel B: Board diversity UK.

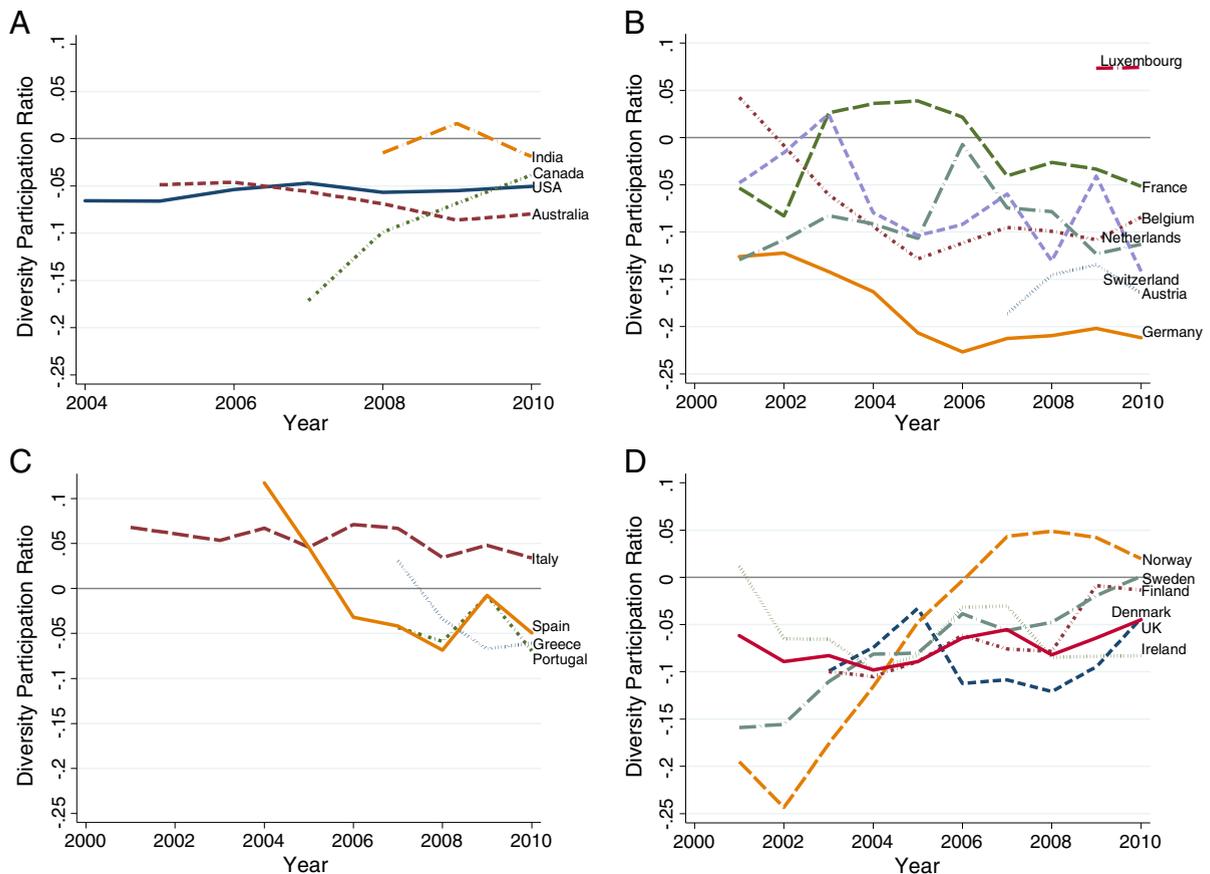


Fig. 5. Differences in diversity and participation relative to participation. Fig. 5 shows trends in the Diversity Participation Ratio for 22 countries using data from Adams and Kirchmaier (2015a), Appendix Tables A.1 and A.2. The Diversity Participation Ratio = (diversity-participation)/participation for each country over time. Adams and Kirchmaier's (2015a) base sample is Boardex data on unregulated firms from 2001 to 2010. Board diversity is the fraction of women on the board. In companies with dual boards, the management board and the supervisory boards are combined. Data for countries with relatively few companies in the initial years of coverage are dropped. Bermuda is dropped because the Diversity Participation Ratio is so large that it affects the scaling. The countries are grouped as in Fig. 2. Panel A: Selected Commonwealth countries and USA. Panel B: Western Europe. Panel C: Southern Europe. Panel D: Northern Europe.

They also find that the market reaction to acquisitions and debt (but not equity) issues is higher in male to female transition firms. Their interpretation is that female executives are less overconfident or more risk-averse than male executives.

Levi, Li, and Zhang (2014) also examine acquisition activity, but they focus on boardroom gender diversity rather than executive gender. Using data on S&P 1500 firms from 1997 to 2009, they relate the number of deals in a year and the bid premium to the fraction of women on the board. To address endogeneity issues, they use firm fixed effects and an instrumental variable strategy. They find that more gender diverse boards are associated with lower deal initiation activity. But they are also associated with lower bid premia which suggests that more gender diverse boards are less likely to overpay. Their interpretation is that more diverse boards are less overconfident.

Faccio, Marchica and Mura (2015) examine the gender of the CEO and corporate risk-taking. To increase the number of female CEOs they use a sample from Amadeus Top 250,000 from 1999 to 2009 which consists primarily of private firms (95.1%). Women are more likely to be CEOs of private firms in their sample (9.93%) than CEOs of public firms (7.03%). They regress three measures of risk taking, leverage, the standard deviation of ROA and survival, on CEO gender. As in Huang and Kisgen (2013), they focus on executive transitions to address endogeneity problems. They also examine some firm fixed effects specifications and do instrumental variable analyses. They find that CEO gender is negatively associated with corporate risk measures. Their interpretation is that the gender differences in risk taking behavior documented in the experimental literature extend to top corporate executives.

Matsa and Miller (2013) use the 2006 adoption of the Norwegian gender quota as a natural experiment to examine causal effects of board diversity on corporate policies in a primary sample of data from 2003 to 2009. They use a difference-in-difference and triple difference setting with firms in other Nordic countries serving as the control group. They find that most corporate decisions were unaffected by the increase in board diversity following the quota. But firms with more diversity following the quota were different in one important aspect. They had fewer employee layoffs which led them to have higher relative labor costs. Matsa and Miller's interpretation of this finding is that female directors have more other-regarding preferences.

Tate and Yang (2015) examine whether female managers create more female friendly corporate environments using worker-firm matched panel data from the US Bureau of the Census's Longitudinal Employer-Household Dynamics (LEHD) program. To address endogeneity problems, they use plant closures from 1993 to 2001 as an exogenous shock to employment. They compare wages of male and female workers who moved from the same closed plant to the same new plant and examine whether the new wage differences depend on the fraction of women in the management of the new firm. They find that displaced women experienced 5% more wage losses than men, but this loss was reduced by roughly 50% if they moved to firms with more women in management. This evidence is consistent with the idea that female executives have more other-regarding preferences.

While the findings from these papers are consistent with the idea that “typical” gender differences in preferences carry over to the boardroom, the direct evidence that this is the case is not as clear. Adams and Funk (2012) analyze directors' psychological traits using a survey of Swedish directors. They survey directors on human values according to Schwartz (1992) and risk-aversion. Their sample contains responses from 628 individuals (a response rate of 36.6% from directors and 29.7% from CEOs) representing all but 36 (12.59%) of all publicly traded firms in Sweden in 2005.

Because values transcend particular situations, they are particularly useful for comparing directors from different firms. One advantage of focusing on Schwartz values is that they are also measured in the European Social Survey and the World Values Survey. Adams and Funk use these datasets to construct population gender gaps as benchmarks for boardroom gender gaps in values. They find that female and male directors are generally not the same in their values. Perhaps more importantly, boardroom gender gaps are often not the same as the “typical” gender gaps in the population.

Fig. 6 illustrates their findings by comparing boardroom gender gaps in values to population gender gaps using data from Table 2 in Adams and Funk (2012). Panel A of Fig. 7 plots gender gaps in values for a representative sample of the Swedish population from the third wave of the European Social Survey (ESS). The gender gap is defined as the mean value for men minus the mean value for women. Schwartz identifies 10 basic human values that are labeled achievement, power, security, selfdirection, stimulation, tradition, universalism, conformity, benevolence, and hedonism.

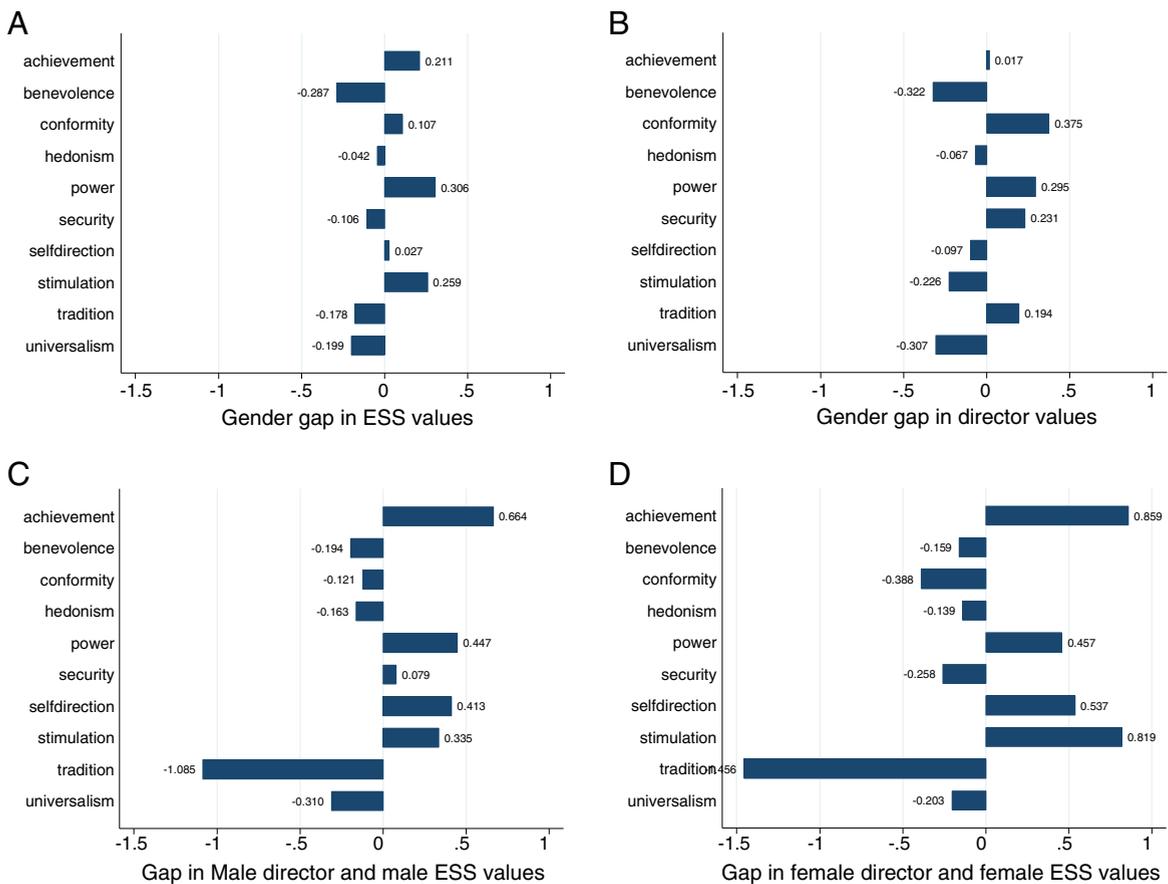


Fig. 6. The role of selection. This figure provides a graphic depiction of the results in Adams and Funk (2012), Table 2. Adams and Funk (2012) surveyed the population of Swedish directors on their human values according to Schwartz (1992). They combined it with data on Schwartz values from the third wave of the European Social Survey (ESS). Raw value scores range between 1 and 6, with higher numbers reflecting a higher importance of the respective value dimension. Panels A–D show relative values which are individuals' raw values minus their mean response to all survey items. Panel A shows gender gaps in values in the ESS. Gender gaps are defined as the average values for men minus those for women. Panel B shows gender gaps in values for directors. Panel C shows differences between the average values for male directors and men in the ESS. Panel D shows differences between the average values for female directors and women in the ESS.

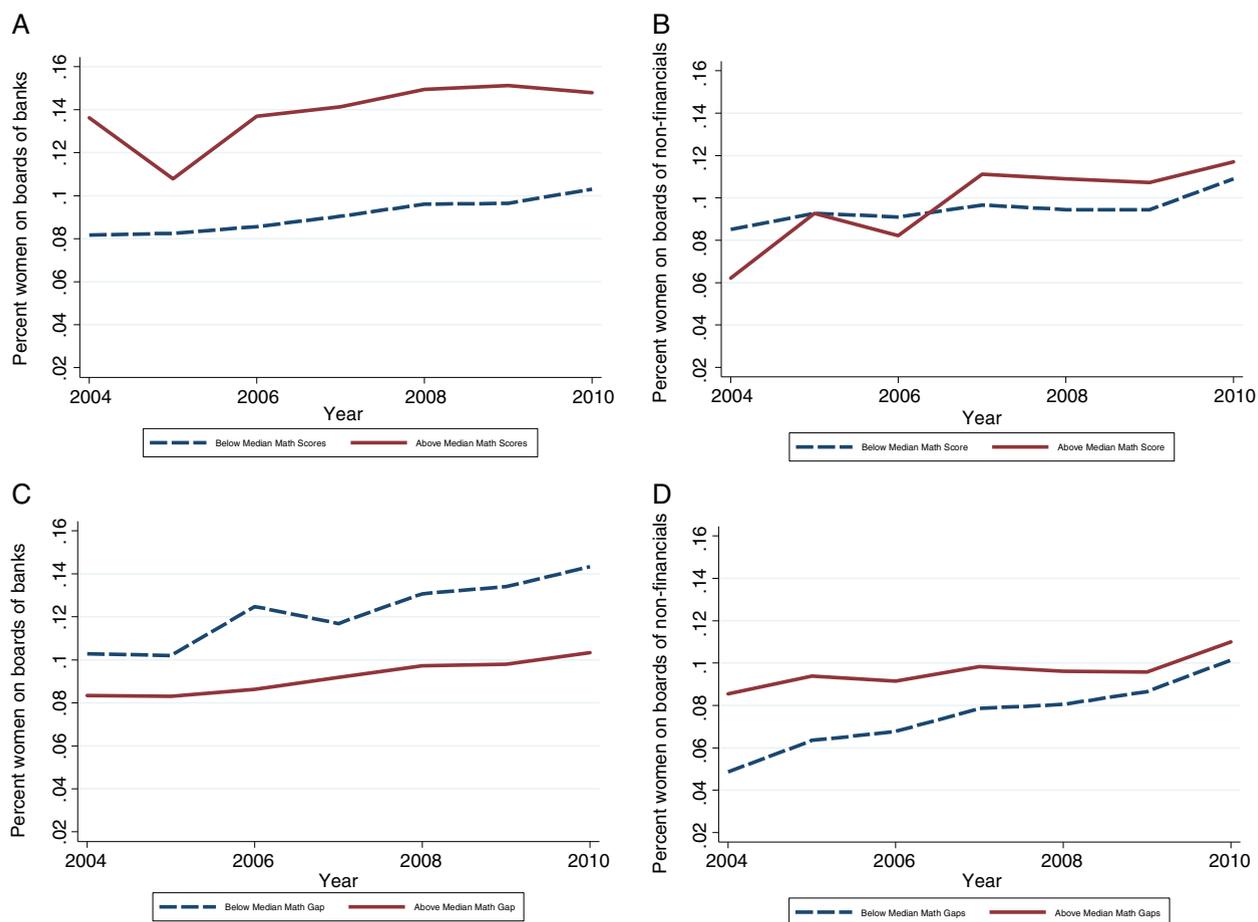


Fig. 7. PISA math scores and gender diversity of banks. Fig. 7 shows the fraction of women on the boards of banks and nonfinancial firms from Adams and Kirchmaier (2015b). Adams and Kirchmaier's (2015b) base sample is the same as in Adams and Kirchmaier (2015a) except that they do not exclude financial firms. They impose the same coverage restrictions on the sample as in Figs. 2–6. Board diversity is the fraction of women on the board. In companies with dual boards, the management board and the supervisory boards are combined. The figure depicts diversity for banks and a matched sample of non-financial companies over time, stratified by being above or below the median sample math scores and math gender gap. Math Score is a dummy variable indicating whether the average PISA math score for a particular country in 2009 was above the median math score of all countries in our sample. Math Gap indicates whether the difference between the math scores for boys and girls was larger than the median gap for all countries in the sample. Companies in Norway and India are excluded. Panel A: Average board diversity for banks across countries stratified by above and below median 2009 PISA math scores. Panel B: Average board diversity for non-financial firms across countries stratified by above and below median 2009 PISA math scores. Panel C: Average board diversity for banks across countries stratified by above and below median 2009 PISA gender gaps in math scores. Panel D: Average board diversity for non-financial firms across countries stratified by above and below median 2009 PISA gender gaps in math scores.

conformity, tradition, benevolence, universalism, self-direction, stimulation, and hedonism. On average, women are less achievement-, conformity-, power-, self-direction-, and stimulation-oriented than men, but they are more benevolence-, hedonism-, security-, tradition-, and universalism-oriented. Panel B plots gender gaps in values for Adams and Funk's sample of directors. On average female directors are less achievement-, conformity-, power-, security-, and tradition-oriented than male directors, but they are more benevolence-, hedonism-, self-direction-, stimulation-, and universalism-oriented than men. Panel B shows that female directors are not exactly like male directors. So gender differences still exist in the boardroom. However, these gender differences are not always the same as the population gender differences. Most notably, the boardroom gender gaps in security, self-direction, and tradition are the opposite of their population gender gaps. While women in the population are more security- and tradition-, and less self-direction- and stimulation-oriented than men in the population, female directors are less security-, tradition-, and more self-direction- and stimulation-oriented than male directors. Adams and Funk also find that female directors are less risk-averse than male directors, which is the opposite of the findings of most studies of non-managerial samples.⁸

⁸ The European Social survey does not contain a risk-aversion measure that Adams and Funk (2012) can use to benchmark their risk-aversion measure to.

Panels A and B also illustrate that even when the boardroom gender gaps go in the same direction as the population gender gaps, they are often quite different in magnitude from the population gender gaps. For example, the achievement gender gap is much smaller and the conformity and universalism gender gaps are much larger than in the ESS.

What explains the differences between the boardroom gender gaps and the population gender gaps? Adams and Funk (2012) attribute the differences to selection. Because it is unusual for women to hold board seats, the women who hold them must be unusual. It is highly unlikely that women who are not very self-directed and are very security-oriented and risk-averse would pursue a career path that would lead to a directorship. The same goes for men, of course, but Adams and Funk argue that men face fewer obstacles to career success. Women who achieve business success might have to be so extreme in some of their values that gender gaps in leadership positions actually reverse.

Panels C and D illustrate how selection manifests itself. Panel C compares average values for male directors to those of male members in the ESS. Panel D compares average values for female directors to those of female members in the ESS. The differences between female directors and other women are often substantially bigger than the differences between male directors and other men, most notably for conformity, security, stimulation, and tradition. These are all values which presumably play a role in the choice of a career path that is more unconventional. It is possible that benevolence and universalism play less of a role in career choices, which may explain why the female directors do not emphasize these values less than male directors.

Because values are abstract, it is not obvious whether they feed into corporate decision-making. Adams, Licht, and Sagiv (2011) link director values to decision-making using the same value data as in Adams and Funk (2012) and measures of shareholder-orientation in decision-making. They present directors with vignettes based on seminal court cases in which directors were sued for their decisions in shareholder–stakeholder dilemmas and ask directors how they would have decided. They construct an index of shareholder orientation from the answers and show that directors are more pro-shareholder the more achievement-, power-, and self-direction- and the less universalism-oriented they are. Given the evidence in Adams and Funk (2012), it is perhaps not surprising that they also find that female directors are less shareholder- and more stakeholder-oriented than male directors.

The evidence in Adams and Funk (2012) and Adams et al. (2011) provides direct evidence suggesting that there is a case for board diversity. Female directors may bring different values to the table and these values may feed into how they, and the board, make decisions. Depending on the circumstances, diversity in values may lead to better decisions. But one has to be careful about predicting the preferences of female directors using evidence from non-managerial samples. Female directors are not random members of the population. Instead they arrive at their positions through a process of selection. Because of selection, female directors may not only be quite different from male directors but also quite different from representative women in the population. We do not yet understand how the presence of female directors may affect decision-making and corporate outcomes. Matsa and Miller's (2013) and Tate and Yang's (2015) evidence that more gender diverse management teams may care more about employees is consistent with Adams and Funk's (2012) and Adams et al.'s (2011) evidence that female directors are more universalism- and stakeholder-oriented than male directors. But, Adams and Funk's (2012) evidence that female directors are less risk-averse than male directors casts doubt on the idea that more women in management positions will necessarily lead to less risk.

Although Huang and Kisgen (2013), Levi et al. (2014) and Faccio, Marchica and Mura (2015) interpret their results as being consistent with lower female overconfidence or greater female risk-aversion, other explanations of their evidence are possible. For example, more gender-diverse boards and management teams may take longer to make decisions (e.g. Milliken & Martins, 1996). This could lead them to invest less and to make fewer acquisitions—strategies that could affect their financing needs. Levi, Li and Zhang (2013) recognize that their evidence is consistent with this explanation as deal completion time in their data is longer the more diverse the acquirer's board is. Another possible explanation is that women are more likely to be on the boards of family firms and family firms may behave more conservatively because they care about passing the firm on to future generations. Firm fixed effects can address this issue to some extent.

Even if one accepts the interpretation of the above-mentioned papers, one may still have to exercise caution in generalizing the results. Berger, Kick, and Schaeck (2014) find evidence that German banks with more gender diverse management teams have greater portfolio risk. Similarly, Adams and Rangunathan (2014) do not find any evidence for the “Lehman Sisters” argument that banks with more gender diverse boards should have had lower risk during the crisis. Selection may be more important for banks than for the mostly private firms in Faccio, Marchica and Mura (2015), since there are fewer women on the boards of banks. Consistent with this idea, Adams and Rangunathan (2014) provide some evidence suggesting that women in finance may be significantly less risk-averse than other women and less risk-averse than men in finance.

Much more research needs to be done to understand when selection will be more and when it will be less important. But it is hard to imagine that it will never matter. Recognizing the possibility of selection is important both for interpreting research and questioning the assumptions underlying it. For example, some argue that female directors only have an impact when there are three or more of them on the board. This hypothesis is hard to reconcile with the idea that selection is operating. Even if tokenism motives played a role in her appointment, the first female director who makes it on a board is presumably not shy. After all, Adams and Funk's evidence suggests that female directors are more self-directed than both their population counterparts and male directors. This may be even truer for the first female director on a board. Any “three or more” results may be driven by other factors. Recognizing the possibility of selection is also important for designing policy. If selection leads female directors to be less risk-averse than male directors then requiring financial institutions to have boardroom diversity targets, as the European Commission's (2014) Capital Requirement Directives do, may not lead to better risk management.

Barriers to boardrooms

We know very little about the causes of female relative underrepresentation on boards. One important reason why we need more research on this topic is that the causes of underrepresentation are likely to affect how important selection is and, as a result, gender gaps in director preferences. If gender gaps vary across different types of firms and countries, the impact of board diversity may also vary across different types of firms and countries.

Adams and Funk (2012) suggest that the director gender gaps they document may actually be larger in countries that are less family friendly than Sweden. They show that female directors in the US are less likely to be married and have fewer children than female directors in Sweden which suggests that barriers to boardrooms may be larger in the US. It is plausible that the female directors who overcome the barriers in the US are even less tradition-oriented and more self-direction-oriented than the female directors in Sweden. The differing evidence in Adams and Ragunathan (2014) and Berger et al. (2014) is consistent with this argument. Adams and Ragunathan (2014) find that more gender diverse boards are not associated with bank risk in the US but Berger et al. (2014) find that more gender diverse management teams are associated with more bank risk in Germany. Historically, Germany had notoriously poor child-care services which made it very difficult for women with children to work (BiB, 2013). It is plausible that the German women who chose to work and ended up in Berger et al. (2014) management teams are much more risk-seeking than their US counterparts.

We also need more research on the causes of relative female underrepresentation to be able to assess the potential effectiveness of current diversity policies in achieving their societal and governance objectives. For example, if childcare services in a country are so poor that women never work long enough to gain board qualifications, it is hard to see how a board quota will fix the problem. Instead, board quotas may need to be accompanied by, or even substituted with, policies that improve childcare services.

The evidence that women shy away from competition (Niederle, 2014) suggests that one cause of relative female underrepresentation may be women's unwillingness to take up directorships. But, it seems unlikely that women who are sufficiently qualified to be directors would shy away from competition in the boardroom. Moreover, the fact that board diversity and participation increase following diversity policies suggests that women are accepting directorships.

Companies may also be to blame. Implicit in the business case argument for more women on boards is the suggestion that firms are deliberately not hiring women even though they could. The European Commission (2012a), p. 3) makes this explicit:

“The core of the problem lies in the persistence of multiple barriers faced by the constantly growing number of highly qualified women who are available for board seats on their way to the top positions in corporations. The reluctance to appoint female candidates to board positions is often rooted in gender stereotypes in recruitment and promotion, a male-dominated business culture and the lack of transparency in board appointment processes.”

By targeting companies, policy-makers seem to suggest that there is an easy fix for the problem. Adams and Kirchmaier (2015a) provide evidence that targeting companies may not be enough. In their panel of data on 22 countries, they relate their measure of female participation in the director pool to female labor force participation, economic development, proxies for the provision of government services to families and measures of culture. They find that female labor force participation is positively correlated with the participation of women in the director pool, but only if they exclude part-time and unemployed workers from the calculation of female labor force participation. This suggests that in countries in which it is harder for women to work full time, there may simply not be enough women at the top of the corporate ladder who are potential candidates for directorships. The reasons may be that women drop out of the labor force early or start working part-time which means they do not accumulate the skills necessary to become directors.

Adams and Kirchmaier (2015a) also find a positive correlation between female director participation and government provision of services to families and more positive cultural attitudes towards women. To examine the role of culture further, Adams and Kirchmaier (2015b) explore whether the representation of women on the boards of financial firms varies with gender gaps in high school math scores. Fig. 7 replicates the figure from their paper that shows the average fraction of women on the boards of banks and a matched (on assets) sample of non-financial companies stratified by countries above and below sample median math scores and math gender gaps. The math scores and math gender gaps are from the 2009 PISA (OECD, 2010). The figure shows that in countries in which the gender gap in math scores is smaller, i.e. girls and boys perform similarly, there are more women on the boards of banks. Since there is no genetic basis for the gender gap in math scores (e.g. Else-Quest, Hyde, & Linn, 2010), this result is unlikely to be explained by an argument that girls in some countries are less capable of doing math than girls in other countries. Instead, perceptions about women's ability to do math may play a role in their career advancement. Adams and Kirchmaier also show that math scores are related to women's representation in other industries in which math skills might be important.

The results from Adams and Kirchmaier (2015a, 2015b) suggest that the root causes of the relative underrepresentation of women on boards are much deeper than board hiring practices. Policy-makers who want to increase the representation of women on boards may eventually have to target these causes directly.

The business case argument

Many consulting companies' studies document that more gender diverse board perform better (e.g. Catalyst, 2007; McKinsey, 2007). As evidence, many of these studies provide graphical representations of correlations between measures of

performance and board diversity. Many of these studies have a disclaimer that correlations do not imply causation, e.g. Footnote 2 in *Catalyst* (2007) says: “Correlation does not prove or imply causation.” But none of these studies disentangles causality from correlation.

Can board gender diversity cause better firm performance? From a theoretical perspective, the answer is: yes, it can. But theoretically diversity also need not increase firm performance and can even reduce it. For example, if female directors are less risk-averse than male directors, as *Adams and Funk* (2012) suggest, then more gender diverse boards may take more risk which can lead to either better or worse decisions. If female managers are more risk-averse than male managers, as *Faccio, Marchica and Mura* (2015) suggest, then more gender diverse boards may take less risk which can lead to either better or worse decisions. Similarly, if more gender diverse boards are more stakeholder-oriented, then this can be good or bad for firm performance. If selection causes female directors to be quite different across countries, industries and types of firms, we might expect the relationship between diversity and performance to differ across countries, industries and types of firms (see also *Post & Byron*, 2014).

Complicating the issue even further is the fact that we have no idea how preferences aggregate in teams. Is the risk-aversion of a board simply the mean level of risk-aversion of the individual members? The answer is likely to depend on the structure of the team, group dynamics, the type of decision-rules the team uses and the complexity of the task (e.g. *van Dijk, van Engen, & van Knippenberg*, 2012).

Changes in diversity may also reflect changes in other director characteristics and firm circumstances (see also *Ferreira*, 2014). Using their data on S&P 1500 firms from 1996 to 2003, *Adams and Ferreira* (2009) find female directors have better attendance records at board meetings than male directors; male directors have better attendance records the more women are on the board and CEO turnover is more sensitive to performance in firms with more gender diverse boards. However, the positive correlation between board diversity and performance vanishes once they include firm fixed effects (see the example in *Table 1* above) and use instrumental variable techniques to address endogeneity problems. *Adams and Ferreira* (2009) suggest that in their sample changes in board diversity lead to changes in perceived and actual independence that can be value-destroying. Consistent with this argument, they find that companies that are more protected from takeovers and might have a greater need for board monitoring benefit from board diversity, while other companies do worse with more diversity.

Ahern and Dittmar (2012) use the implementation of the 40% board quota for public limited companies in Norway as a natural experiment to identify the effect of board diversity on performance. Since the quota was implemented for fairness reasons it can be considered to be an exogenous shock to diversity. They show that the market reaction to the law was negative and firm performance declined after the enactment of the quota law. They argue that this performance decline may not be due to a gender effect. Instead, it may be due to a decrease in board age and experience that occurred as a result of the quota. In their extension of *Ahern and Dittmar*, *Eckbo, Nygaard, and Thorburn* (2015) do not find a negative performance effect of the Norwegian quota, but they also do not find a positive effect.

Matsa and Miller (2013) also argue that the Norwegian quota reduced firm performance. But they disagree with *Ahern and Dittmar* about the mechanism causing the results. They argue that experience and age did not decrease. Instead, firms with more women took more actions that were favorable to employees. They had fewer employee layoffs which led them to have higher relative labor costs in the short run. They attribute their results to a female leadership “style”.

Bøhren and Staubo (2015) show that the Norwegian quota was not just a shock to board gender diversity; it was also a shock to board independence. Because female directors are more often independent than male directors, board independence increased from 46% before the quota to 67% after the quota. They also find the quota decreased firm value, but more so in small firms. Their interpretation is similar to *Adams and Ferreira's* (2009) interpretation: because increases in diversity can change perceived and actual independence, firm value may not improve with more diversity. As *Ferreira* (2014) argues, disentangling the causal effect of board gender diversity is hard. Even studies using the Norwegian natural experiment may not be perfectly identified. But this does not mean that one should be satisfied with correlations. The business case argument creates false expectations for female directors. Recognizing that the business case may fail is important to spur research into the true benefits of diversity and to create more effective policies in the long-run.

Conclusion

This is the age of the female director. Before this, it was the age of the independent director. Who can predict what the next governance trend will be? Trends come and go, but the women who achieve directorships now will still be in these positions many years from now. While they may not (always) be superheroes, there is little doubt that they will influence firm and societal outcomes. To characterize this influence we need a better understanding of what women bring to the boardroom table and how diversity affects firm outcomes.

There is also little doubt that economies can do better when women are fully able to realize their potential in whatever form that may be. We can learn a lot about the constraints women face and women's career progression from analyzing female board representation.

We have an even longer way to go towards breaking the boardroom glass ceiling than many would have us believe. Better data and empirical techniques that address selection problems and other sources of endogeneity can help uncover the root causes of the problems and allow society to tackle them directly through policies that may or may not target boards of listed firms directly.

Appendix A: Summary statistics for sample in Table 1.

The sample is from Adams and Ferreira (2009). It consists of an unbalanced panel of data on unregulated S&P 1500 firms for the period 1996–2003 from Riskmetrics (formerly IRRC), Compustat and CRSP. ROE is defined as Net Income Before Extraordinary Items and Discontinued Operations divided by Total Common Equity.

Panel A: Summary statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
ROE	9188	8.816	19.634	−142.79	75
Fraction female directors	9188	0.083	0.083	0	0.5
Log(Sales)	9188	7.233	1.460	−0.931	12.044
Board size	9188	9.341	2.658	3	39
Fraction independent directors	9188	0.623	0.185	0	0.938
# Business segments	9188	5.938	5.001	1	32

Appendix, Panel B: Correlation matrix.

	ROE	Fraction female directors	Log(Sales)	Board size	Fraction independent directors	# Business segments
ROE	1					
Fraction female directors	0.103	1				
Log(Sales)	0.242	0.330	1			
Board size	0.141	0.258	0.542	1		
Fraction independent directors	0.013	0.215	0.133	0.079	1	
# Business segments	−0.002	0.124	0.270	0.207	0.144	1

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