Women on Boards of Directors and Firm Performance: Does Culture Matter?

Boris van Oostveen

PwC Netherlands; borisvanoostveen@hotmail.com

Lammertjan Dam

University of Groningen; l.dam@rug.nl

Niels Hermes[1]

University of Groningen; c.l.m.hermes@rug.nl

ABSTRACT

This study focuses on the relationship between female representation on boards of directors and firm performance, and investigates whether this relationship is influenced by the impact of cultural values. We use a unique dataset consisting of 17,680 firm-year observations covering the period 2004 to 2011 for companies in 19 European countries. Our results show first that culture affects female board representation. Moreover, we show that, once we control for the fact that female board representation is determined by cultural values (along with measures of female labor participation and director networks), we find a clear statistically and economically significant positive effect of female board members on firm performance.

Keywords: Board of directors, gender, diversity, culture

JEL Classification: G30, G34, J16, M14

EFM Classification: 150

[1] Corresponding author: Niels Hermes, Faculty of Economics and Business, University of Groningen, PO BOX 800, Groningen, The Netherlands, T: +31-50-3634863; F: +31-50-3637356; E: c.l.m.hermes@rug.nl

I. INTRODUCTION

In August 2013, the European Central Bank announced that by 2019 it aims at having increased the number of women on top management positions within the organization from 14 to 28 per cent (Der Spiegel, 2013). This announcement reflects the current debate on female participation in top positions in companies and international organizations. The general view is that these participation rates are too low. Data seem to support this view. Catalyst (2007) reports that female directors account for 14.8 per cent of the Fortune 500 board seats in 2007. In Australian, Canadian and Japanese boards, female directors take 8.7, 10.6 and 0.4 per cent of board seats, respectively (Adams and Ferreira, 2009). As shown in table I, in Europe, on average 6.6 per cent of all board members are women. The debate has led to pressure on policy makers to come up with regulation to stimulate female participation in top-level positions. In 2004, the Norwegian government passed a law mandating state-owned and inter-municipal firms to have at least 40 per cent women on their boards (Storvik and Teigen, 2010). Following this example, Spain introduced a comply-or-explain quota in 2007, Iceland followed in 2011, and at the moment (September 2013) Germany, Italy, the Netherlands and the United Kingdom are contemplating the same (Storvik and Teigen, 2010; Werdigier, 2011). Moreover, since 2010, listed companies in Finland need to have at least one female director on the board and in 2011 France passed a law stipulating a similar gender parity around 2015 to 2017 (Reding, 2011).

<Insert Table I here>

Based on diversity theory increasing female board membership is expected to positively affect firm performance. The central premise is that, as boards are dominated by men, increasing the share of female directors improves board heterogeneity. In particular, female directors may bring different work experience to the board, have different viewpoints on how to solve problems

and/or take decisions, have different educational and international backgrounds, and a different approach to monitoring (Singh et al., 2008; Adams and Ferreira, 2009), which in turn has a positive impact on firm performance. Yet, empirical studies linking female board membership and firm performance show mixed results (Singh et al., 2001; Carter et al., 2003; Erhardt et al., 2003; Farrell and Hersch, 2005; Smith et al., 2006; Catalyst, 2007; McKinsey, 2007; Campbell and Minguez-Vera, 2008; Adams and Ferreira, 2009; and Bøhren and Strøm, 2010).

In this paper we argue that, in order to be able to correctly establish the link between female board membership and firm performance, we need to take into account cultural values, because these values can, at least partly, explain the probability that women end up as board members of firms. In particular, we argue that cultural factors may work as barriers for women to end up in corporate boards, lowering the optimal level of board diversity, which in turn reduces firm performance.

We investigate the relationship between female board participation and firm performance using data 17,680 firm-year observations covering the period 2004 to 2011 for companies in 19 European countries. Using such an extensive multi-country data base allows us to make an important contribution to existing research on the relationship between board diversity and firm performance because it allows us to look at how national cultural differences influence female board participation and its impact on firm performance. In previous studies this has not been addressed as they mostly focus on a single country context (e.g. the U.S. and Norway). Our study shows first that cultural values, along with interpersonal relationships and female labor market participation, affect female board representation. Moreover, we show that, once we control for the fact that female board representation is determined by cultural values, next to measures of

female labor participation and interpersonal relationships, we find a clear statistically and economically significant positive effect of female board members on firm performance.

The remainder of this study is organized as follows. The following section discusses theory and empirical evidence on the relationship between female board participation and firm performance. In this section we also discuss the definition and role of cultural values, and how they may affect female board participation and ultimately also firm performance. In section III we present our methodology, followed by a description of the data in section IV. Section V is devoted to discussing our results, after which we present our conclusions, limitations of the research framework and suggestions for future research.

II. LITERATURE REVIEW

Boards, female board participation and firm performance

Both agency theory and resource dependence theory can explain why there may be a positive relationship between female board participation and firm performance (Van der Walt and Ingley, 2003). According to these two theories female directors bring different skills to the board. Raising the share of female directors increases board diversity, which is supposed to improve the skill complementarities of the board of directors as a whole. Board performance can be seen as a function of board heterogeneity, since a more diverse board, at least potentially, means access to more ideas and perspectives, and different experiences and skills (Anderson et al., 2011).

Depending on the theoretical perspective, boards are assumed to serve different functions. According to agency theory, boards align the interests of managers (i.e. maximize firm value) with those of shareholders. To achieve this, they monitor and discipline managers when necessary (Jensen and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983; Eisenhardt, 1989).

If managers do not perform in accordance with the interests of shareholders, they risk being sanctioned and replaced by the board. The better the board performs and aligns the interests of managers with those of shareholders, the better a firm is expected to perform.

Research has shown that men and women behave differently and have different talents and perspectives. With respect to behavioral differences, Croson and Gneezy (2009), based on a literature survey, argue that women differ from men with respect to risk, social and competitive preferences. In particular, they argue that women are more risk-averse, less overconfident and more sensitive to social signals in determining appropriate behavior. With respect to differences in talents and perspectives, Hillman et al. (2002) find that female directors are more likely to come from non-business backgrounds, are more likely to hold advanced degrees and join multiple boards at a faster rate. Singh et al. (2008) confirm that women are more likely to hold higher degrees. Moreover, they report that adding women to the board increases international diversity. They also show that women are significantly more likely to be experienced board members, as they have fulfilled several of these positions, especially in smaller firms.

The differences in behavior and talents between men and women, among other things, may affect their ability and willingness to monitor and discipline managers, which may ultimately also have an impact on firm performance. Adams and Ferreira (2009) provide evidence for this using data from US based firms. They show that increasing female board participation improves the monitoring performance of boards. In particular, they find that female directors are less likely to experience attendance problems and that increasing female board participation results in less attendance problems for male directors. Thus, boards are expected to do a better job carrying out their duty and gathering information when the share of female directors increases. Moreover, they show that female directors are more likely to join the audit,

nominating and corporate governance committees than male directors. This means that if directors affect board governance more easily via committees, female directors have the potential to affect board governance more easily than their male counterpart. Adams and Ferreira (2009) also find that the extent of female directors positively affects the sensitivity of director turnover to stock performance and equity-based pay for directors. These findings suggests that increasing the extent of female directors causes boards to discipline managers and align the interests of managers with those of shareholders (via equity-based pay) more easily. Altogether, these results suggest that female board participation is expected to positively affect the monitoring and disciplining function of the board. Adams and Ferreira (2009) also find that increasing female board participation improves firm performance, but only for those firms that are characterized by weak corporate governance, suggesting that only for these firms the stronger monitoring and disciplining abilities of the board seem to work out positively.

According to the resource dependence theory firms depend on entities in their external environment, as these entities control resources crucial to them (Pfeffer, 1972; Pfeffer and Salancik, 1978). Firms have the potential to develop links with these entities to minimize dependency and obtain the important resources. Board directors fulfill a key role as they may function as a linking pin between the firm and the external entities. In particular, these directors may provide several benefits to firm performance.

First, board directors provide advice and counsel to managers in support of strategic decision making. According to Hillman et al. (2007), boards set the parameters for strategic decision making, they are often involved in strategy initiation, and participate in all phases of the strategic decision making process. This effort by directors to provide managers with better strategic decision making is expected to benefit firm performance. Hillman et al. (2007) also

argue that heterogeneous groups show a higher ability to search information and provide a greater range of strategic perspectives, which leads to generating more alternative solutions to problems and more and more different perceptions about the environment. Heterogeneous groups are also more creative and more innovative, which facilitates the advice and counsel function. In line with this view, increasing the share of female directors may bring a broader range of perspectives and non-traditional approaches to problems, which benefits the advice and counsel function (Carter et al., 2010).

Second, directors provide organizational legitimacy, which is referred to as the acceptance of a firm by its environment, i.e. the congruence between the social values associated with the firms' activities and the norms of acceptable behavior within the firms' social environment (Dowling and Pfeffer, 1975; Suchman, 1995). Organizational legitimacy is considered to be a key component of a firm's survival (Hillman et al., 2007). Without legitimacy, a firm will find it more difficult to do business and exchange resources with the environment. According to Pfeffer and Salancik (1978) board members can provide legitimacy as "prestigious or legitimate persons or firms represented on the board provide conformation to the rest of the world of the values and worth of the organization." Board directors thus have the potential to legitimize the firm with respect to key stakeholders. Related to this, present-day societal norms, values and beliefs place significant pressures on firms to increase the extent of female board directors. According to Hillman et al. (2007), institutional investors increasingly scrutinize organizational boards for gender heterogeneity. Thus, in order to preserve, let alone gain, legitimacy towards these institutional investors, firms have to increase the extent of female directors. Additionally, a firm's reputation and credibility in the internal and external labor market may also benefit from increased gender heterogeneity (Daily and Schwenck, 1996).

Third, board members are able to provide channels for communicating information and obtaining commitments, support and preferential access to resources from important elements in the environment (Hillman et al., 2009). By doing so, directors increase control over the environment and valuable resources, which may add value to the firm. Several studies have confirmed the importance of this role of boards. Haunschild and Beckman (1998) find that board members help exchange valuable information between firms. Stearns and Mizruchi (1993) find that the type of financial institutions represented on the board of directors affects the type of financing a firm obtains. A similar finding is reported by Van Ees et al. (2003). With respect to female board participation, it can be argued that by increasing the extent of female board members, boards are able to provide more and/or alternative channels for communicating information as well as for obtaining commitments, support and preferential access to resources. Women have different experience sets, beliefs, and perspectives (Kanner, 2004). Moreover, female directors may serve as a role model within the firm. Following Singh et al. (2001) and Hillman et al. (2007), they symbolize career possibilities and inspire current and potential employees, thereby contributing to the work ethos of these employees.

Cultural values and female board participation

Culture refers to the collective programming of the mind that distinguishes members of one group from another. This definition stresses shared values, norms, beliefs, and expected behaviors that are deeply embedded, unconscious, and often irrational (Hofstede, 2001). Such shared values define what represents acceptable and/or desirable behavior within society. Accordingly, it can help members of a society in making decisions and/or judgments of decisions of others. There is a growing literature in economics and finance focusing on the role of cross-national cultural differences in affecting decision making by individuals and organizations (Guiso

et al., 2009). Part of this literature deals with how culture is associated with different aspects of corporate governance, such as corporate governance systems (Licht, 2001), CEO compensation (Bryan *et al.*, 2012; Li *et al.*, 2012), the composition of the board of directors (Li and Harrison, 2008) and overall firm-level corporate governance quality (Boytsun *et al*., 2011).

In the literature, several classifications of cultural values are available. We use Hofstede's (1980; 2001) cultural classifications since they have been used extensively. Hofstede distinguishes four dimensions, i.e. individualism, uncertainty avoidance, masculinity and power distance. Individualism refers to a culture in which there is a preference for a loosely knit social framework in society. In individualistic societies individuals focus on themselves and their immediate family members, rather than on the group to which they belong. In such a cultural environment, decisions based on individual needs tend to prevail, i.e. people are less focused on group interests, but instead focus much more on personal achievement. Uncertainty avoidance refers the degree to which members of a society feel uncomfortable with uncertainty and ambiguity. In societies with high uncertainty avoidance, people prefer to avoid dealing with uncertainty, ambiguity, and unstructured situations. They dislike change, assign high value to predictability, and prefer risk-averse behavior. Masculinity as a cultural classification is characterized by the extent to which achievement and success are dominant values in society. In masculine societies the focus is on the desire to perform well and exceed, and there is a strong admiration for being successful. Finally, power distance as a cultural value stands for the extent to which the less powerful members of society expect and accept power being unequally distributed. In societies with high power distance superiors are often inaccessible and those who hold power usually have privileges.

As mentioned, cultural values influence the way members of society decide what is acceptable and/or desirable behavior. This also holds for views on the role of women within society in general and for female board participation and their functioning within boards in particular. First, individualism is expected to positively affect the extent of female board participation, as firms try to legitimize themselves by representing a more diverse range of individual interests. According to Li and Harrison (2008), in highly individualistic societies people are more concerned with self-interest and corporate boards that include more outside directors signal that the interests of different stakeholders of society are advocated by the board. This conforms to the societal norm of respecting each individual's concerns. Additionally, within a society with high individualism, the exchange of private and individual opinions is promoted and valued highly, incubating the expression of (opposing) thoughts, advice and counseling. Hence, within societies characterized by individualism a positive relation between the extent of female directors and firm performance is expected.

Second, in societies with low uncertainty members are more tolerant of uncertain situations, different ideas, approaches and concepts. In societies with high uncertainty avoidance, increasing the extent of female directors challenges the status quo since boards consist primarily out of men. Such a change in board composition requires flexibility from board members who need to cope with the new and uncertain situation. In societies with high uncertainty avoidance, risky and uncertain situations are undesirable, which means that the extent of female board membership is expected to be constrained. Hence, uncertainty avoidance is expected to negatively affect the extent of female board membership.

Third, in masculine societies, competitiveness, assertiveness, achievement and success are dominant values in society. In contrast, societies in which caring for others is emphasized are

considered more feminine (Hofstede 1980; 2001). In a feminine society, a more supportive and social orientation prevails together with a strong concern for the preservation of existing relationships. Since in a masculine society managerial decisiveness, performance orientation and an emphasis on competitive behavior are highly valued, we expect a negative relationship between masculinity and the extent of female board membership. Additionally, no relation between the extent of female directors and firm performance is expected in a society with high masculinity.

Finally, in societies characterized by high power distance, power is unequally distributed among members of society. As mentioned, the less powerful members accept and expect power being distributed unequally and they are afraid of disagreeing with the powerful members and the established order. Applying this to company boards, the established power order has led to boards consisting primarily out of men and in high power distance societies this order will not meet with much opposition when it comes to sharing power and board seats with female directors. Thus, power distance is expected to be negatively correlated with the extent of female board participation. Moreover, increasing the share of female board member is not expected to have strong effect on firm performance in societies with high power distance. The less powerful female directors are expected to be restricted by their male colleagues in sharing (opposing) opinions, thoughts, advice and counseling.

Culture, female board participation and firm performance

The previous discussion has shown that, in theory, increasing female board participation has a positive impact on firm performance as this increases board diversity. At the same time, however, we have argued that cultural values may, at least potentially, constrain the share of women participating in boards. Studies investigating the extent to which female board participation is

associated with firm performance should therefore explicitly take into account the fact that due to specific cultural features the share of women participating in boards may not reach the level at which they can positively contribute to firm performance. Our observation, however, is that the importance of cultural values as a barrier to females entering boards has not been accounted for in the literature until now. What we will do in the empirical analysis of our paper is to first explicitly analyze the relationship between culture and female board participation, after which – in the second step of the analysis – we focus on the association between female board membership and firm performance, controlling for the effect of culture on the share of women on boards. Following this approach, we expect that female board participation has a positive impact on firm performance, which is predicted by both agency and resource-based theory.

Summarizing, we focus on the following hypotheses:

H1: Individualism has a positive impact on female board participation

H2: Uncertainty avoidance has a negative impact on female board participation

H3: Masculinity has a negative impact on female board participation

H4: Power distance has a negative impact on female board participation

H5: Controlling for the impact of cultural values on the share of women in boards, female board participation has a positive impact on firm performance

III. METHODOLOGY AND DATA

In the empirical part of this paper, we follow a two-stage approach. In the first stage we estimate a model in which we explain female board representation. The basic econometric specification we use reads as follows:

$$\text{FEMALES}_{it} = \beta_0 + \beta_1 \text{CULTURE}_i + \beta_2 \text{INSTRUMENTS}_{it} + \beta_3 \text{CONTROLS}_{it} + v_t + \varepsilon_{it} \qquad [1]$$

where, i is an index for the firm, t is a time index, β_0 is a constant, β_1, β_2 and β_3 are coefficient vectors, FEMALES is a vector of variables measuring female board representation, CULTURE is a vector of cultural variables, INSTRUMENTS is a vector of instrumental variables, CONTROLS is a vector of control variables, v_t is a time-fixed effect and ε_{it} is the error term.

The first step of the analysis is used to estimate the fitted values of FEMALES. The instrumental variables approach is used to address potential endogeneity problems. For example, reverse causality may be an issue because of potential sorting of male and female board directors to firms based on performance (Adams and Ferreira, 2009). Following van Ees et al. (2003), it can be argued that in difficult times poor financial performance may trigger shareholders to intervene in the decisions of top management and impose a more diverse board with more independent female directors. Shareholders may reason that a more homogenous and male dominated board is less critical than a more heterogeneous gender diverse board, and that this criticism improves firm financial performance. Hence, shareholders try to improve performance by increasing the number of female directors to make the board more diverse. A related example of reverse causality is provided by Demsetz and Lehn (1985) who argue that if the governance structure affects firm performance and an optimal structure exists which relies on an endogenous choice, value maximizing firms automatically choose this optimal structure. Consequently, when

controlling for other variables, no variation in the values of the governance and performance variables would be observed. This makes it impossible to identify a relationship between these variables. As both examples show the need to account for endogeneity, this study adheres to this by using other variables indicating governance issues to instrument the estimation of the relationship between firm financial performance and board characteristics.

Next, we regress PERFORMANCE on the fitted values of FEMALES and CONTROLS to obtain unbiased and consistent estimates, using the following specification, referred to as the second-stage model:

$$\text{PERFORMANCE}_{it} = \alpha_0 + \alpha_1 \text{CULTURE}_i + \alpha_2 \text{FEMALES}_{it} + \alpha_3 \text{CONTROLS}_{it} + v_t + \varepsilon_{it} \qquad [2]$$

where i is an index for the firm, t is a time index, PERFORMANCE is a vector of variables measuring firm performance, α_0 is a constant, α_1, α_2 and α_3 are coefficient vectors for CULTURE , FEMALES and CONTROLS, v_t is a time-fixed effect and ε_{it} is the error term. Both models [1] and [2] are estimated with robust standard errors to account for group correlation within firms and heteroskedasticity.

The initial dataset consists of the 4,000 largest listed European firms, measured by turnover at December 31st of 2007. We use data covering the years 2004 to 2011. Firm level data originate from firm annual reports and is retrieved from Bureau van Dijk's Orbis database. Board characteristics are hand-collected from S&P's Capital IQ database. The Capital IQ database provides profiles of private and public firm executives and board directors globally. The database goes back to 2003 and focuses on firms operating in all major markets including Europe, North America, Asia, the Middle East and Latin America. The profiles on the personnel level of board directors contain information such as the number of outside directors, the number of other

directorships, the linkages to other boards and the director's gender and age. Country level data are obtained from the World Bank Group; the scores on Hofstede's cultural dimensions are retrieved from the work of Taras et al. (2012). The definitions of variables used in this study are summarized in Table II.

<Insert Table II here>

Firm performance can be measured based on accounting or market data. This study accounts for both by using return on assets and the price to book ratio. Return on assets equals net income divided by total assets; this is a measure of the short term accounting performance. Price to book ratio equals market price divided by book value per share, which is a measure of the long term performance, as market expectations are included in the market price per share. The natural logarithm of both measures is used in our analyses to reduce the impact of non-normality of the data.[2]

We use three measures of female board representation, i.e. the number of female directors, the percentage of female directors and a dichotomous variable that equals 1 when a firm´s board has one or more female directors at the end of the year and 0 otherwise. As boards consist primarily out of men, adding a woman increases gender heterogeneity. These three measures are also used in other studies. Using all three measures in our analyses allows us to check for the robustness of our findings.

Our choice of instrumental variables is determined by the requirement that they are correlated with the variables measuring female board representation and uncorrelated with firm performance. The first instrumental variable measures the number of board directors having a

---

[2] As a consequence of using the natural logarithm, values being equal to or below zero, drop from the data set resulting in less observations. As a robustness check, the analyses are also performed by using the square root of both measures, while preserving the positive or negative signs. The results are available at request by the authors.

seat in other boards with female directors. Medland (2004) and Sheridan and Milgate (2005) argue that women do not enter a board because their lack of connections, i.e. the informal social network, which is the pool from which board directors are drawn, consists primarily out of men. Ceteris paribus, the more a female is connected to this social network, the more she is observed by other directors, increasing the higher the probability she will be selected to join the boardroom. We therefore hypothesize that the number of board directors having a seat in other boards with female directors is positively associated with the extent of female directors on the board. Our second instrumental variable measures the female labor force participation at the country level. When more females actively participate on the labor market, a larger share of them is able to acquire experience and skills necessary to become a board member. Wright and Rogers (2010) show that the increase in female labor force participation has been accompanied by a significant change in the economic opportunities of women in terms of the occupations they fill. In particular, they argue that women have increasingly entered into occupations that where entirely male in the past. Sheridan and Milgate (2005) stress the unequal division of labor in the households in the past, limiting females' access to the boardroom. They argue that traditionally, board positions are considered to be the domain of men and only recently women occupy senior and higher level positions within firms. We therefore expected that female labor participation is positively associated with the number of female board directors.

We take Hofstede's cultural dimensions to measure cultural values, using the standardized scores developed by Taras et al. (2012). In particular, we use their scores for power distance, individualism, masculinity and uncertainty avoidance.

We use measures of board size, firm age and firm size as control variables, as these variables have been frequently used in the literature on female board membership and firm

performance (see, e.g., Carter et al., 2003; Erhardt et al., 2003; Farrell and Hersch, 2005; Rose, 2007; Campbell and Minguez-Vera, 2008; Adams and Ferreira, 2009; Miller and del Carmen Triana, 2009; Carter et al., 2010; and Bøhren and Strøm, 2010). Board size is measured as the number of board directors. Larger boards are assumed to be less effective than small boards as agency problems increase resulting in a more symbolic but less monitoring and disciplining board (Hermalin and Weisbach, 2003). We thus expect a negative relation between board size and firm performance. Firm age is measured as the number of years since incorporation. Firms with more resources and experience in the market in general have a better reputation, which positively affects firm performance (Miller and Triana, 2009). Firm size is measured by three indicators, i.e. total assets, turnover (or operating revenues) and the number of employees, Similar to firm age, firm size is considered to reflect some degree of resources and market experience (Miller and Triana, 2009). Hence, a positive relation with firm performance is expected (Carter, Simkins and Simpson, 2003; Erhardt, Werbel and Shrader, 2003; Campbell and Minguez-Vera, 2008; Carter, D'Souza, Simkins and Simpson, 2010). All firm-level variables are measured by taking the natural logarithm.

Table III shows the descriptive statistics of all variables used in this study.[3] On average firms have 0.532 female board directors, which is remarkably low. The same holds for the average percentage of female directors and the average percentage of firms that have one or more female directors, which is 7.7 and 37.4 per cent, respectively. The average board size equals 6.623. The average number of directors that have a seat in one or more boards at other firms in this sample equals 1.401. Table A.I in the appendix shows that over time female board representation has changed remarkably. First, in Europe the number of female directors increases

---

[3] Table A.I in the Appendix shows the annual decomposition of the descriptive statistics in Table III.

by 86 per cent from 0.374 in 2004 to 0.694 in 2011. Second, over the same period the average percentage of female directors increases by 46 per cent from 6.3 per cent in 2004 to 9.2 per cent in 2011. Third, a similar patterns holds for firms having one or more female board directors, which increases from an average of 29.3 per cent in 2004 to 45.5 per cent in 2011 (i.e. an increase of 55 per cent). Table III also shows that the average female labor participation in Europe equals 44 per cent. Table A.I shows that female labor participation increases from 43 per cent in 2004 to only 44 per cent in 2010.[4] This is remarkably low compared to the increase of female board participation.

<Insert Table III here>

Table IV shows pair wise correlation coefficients between all variables. Ignoring the three measures for firm size, there is no sign of multicollinearity, except with respect to the variables power distance and uncertainty avoidance, for which the correlation coefficient equals 0.75.

<Insert Table IV here>

IV. Results

We start by discussing the results of the first-stage instrumental variables estimation. Initially, we leave out the cultural variables from the model. We include firm- and time-fixed effects in this version of the model. Table V shows the results of the first-stage regressions, in which we estimate the fitted values of the number of female directors, percentage of female directors and female indicator respectively, using two instruments (i.e. number of connected directors and female labor participation) and the control variables and where the return on assets (price to book

---

[4] For 2011 no data regarding labor participation is available.

ratio) is the dependent variable in the second stage.[5] In Columns 1, 2 and 3 we present the first-stage results where the return on assets is used as a performance measure in the second stage, whereas in Columns 4, 5 and 6 we use the price to book ratio. The results clearly show that the number of directors having a seat in other boards with female directors has a positive effect on the number of female directors, the percentage of female directors and the female indicator with respect to both performance measures. This suggests that when a board is connected to outside female directors via current directors, the number of female directors in this board significantly increases. The significant negative effect of female labor participation on the extent of female directors is quite surprising, as we expected a positive relationship based on the work by, e.g. Wright and Rogers (2010) and Sheridan and Milgate (2005). With respect to both performance measures, Columns 1, 2, 4 and 5 in Table V show that female labor participation negatively and significantly affects the number of female directors and percentage of female directors. Of all the control variables, board size has the strongest relationship with female board participation. Columns 1, 3, 4 and 6 show that board size positively affects the number of female directors and female indicator.

<Insert Table V here>

Table VI presents the results for the second-stage instrumental variable analysis. These results are at least partly in line with our expectations. When controlling for omitted variables and reverse causality, all three measures of female board participation positively and significantly affect the price to book ratio. At the same time, the results in the table show no evidence of a

---

[5] Three tests are performed on each model to validate the instruments used. The Angrist-Pischke multivariate F test of excluded instruments rejects the null that the endogenous regressor in question is unidentified. The Kleibergen-Paap test rejects the null that the model in its entirety is under identified (i.e. any of the endogenous regressors is unidentified). The Sargan-Hansen test of over-identifying restrictions does not reject the null that the instruments are valid instruments (i.e. uncorrelated with the error term and excluded instruments are correctly excluded from the estimated equation). These tests consistently show similar results for all models. The results of these tests are available on request by the author.

relationship between female board participation and the return on assets. These results suggest that female board participation positively affects firm performance, but only when it comes to long term performance. In other words, shareholders value female directors and more gender diverse boards. With respect to the control variables, there is evidence that firm size (measured as total assets) is negatively associated with firm performance, either measured as return on assets or price to book ratios. The picture emerging from the results for the other control variables is less clear-cut. Firm age is insignificant in the regressions for return on assets, but is negative and significant when we use price to book ratios; the number of employees is negative and significant for return on assets, but positive and (marginally) significant for price to book ratios; and turnover is only significant in the regressions where we use return in assets as our firm performance measure.

<Insert Table VI here>

Next, we add the cultural dimension to our analysis. As argued, culture may influence the extent of female board participation, which in turn may influence how women on the board affect firm performance. Hence, we analyze whether cultural dimensions affect the extent of women on boards, thus indirectly influencing firm performance. As in the first part of the analysis, we first discuss the results of the first-stage instrumental variables estimation in which we focus on explaining female board participation. As is shown in model [1] we include cultural variables, along with our instrumental variables and control variables, as well as time-fixed effects.[6] Table VII shows the results of the first-stage instrumental variables estimations with the inclusion of Hofstede's cultural dimensions. Again, in Columns 1, 2 and 3 we present the first-stage results where the return on assets is used as a performance measure in the second stage, whereas in

---

[6] The firm-fixed effects have been left out of the analysis because of the time-invariant nature of the cultural variables.

Columns 4, 5 and 6 we use the price to book ratio. The results in table VII very clearly show that culture influences female board participation. We find strong evidence that three of four cultural dimensions, i.e. power distance, masculinity and uncertainty avoidance have a negative impact on all three measures of female board participation for both performance measures. These results are in line with our hypotheses 2-4. Only individualism does not seem to be related to the extent of women on boards. With respect to the instrumental variables, the number of directors having a seat in other boards with female directors remains to have a positive effect on female board participation, independent of how we measure board participation and firm performance. Our second instrumental variable, female labor participation is now positively related to female board participation, which is what we expected; however, the results are not statistically significant.

<Insert Table VII here>

Table VIII shows the results for the second-stage instrumental variable analysis, i.e. we estimate model [2], using the fitted variables for our female board participation measures from the first-stage regressions presented in table VII. The results provide a very clear picture. Controlling for cultural values and a large set of firm-level variables, also controlling for potential endogeneity and taking into account the impact cultural values may have on the extent of women in boards, female board participation always has a positive and significant impact on firm performance. This result is independent of the measure of female board participation and firm performance. This outcome is in line with our hypothesis 5.

With respect to the control variables the results show that some of the cultural dimensions also directly influence firm performance. In particular, this holds power distance (positive relationship) and masculinity (negative relationship). Moreover, having larger boards is

associated with lower firm performance. The same is true for larger firms, measured in terms of total assets. The opposite holds when we use turnover as our measure of firm size.

<Insert Table VIII here>

V. Conclusions

Using a unique dataset covering data for firms from 19 European countries over the period 2004-2011, this study has shed new light on the relationship between female board participation and firm performance. In particular, we have investigated whether cultural values influence the extent to which women end up being in boards of firms and to what extent this influences firm performance.

The first part of the research shows that the extent of female directors positively affects long term firm performance and that endogeneity issues bias results if not controlled for. This study instruments the extent of female directors with two variables; the total number of board directors that have a seat in other boards with female directors and female labor participation. As expected, the total number of board directors that have a seat in other boards with female directors positively affects the extent of female directors. Female labor participation negatively affects the extent of female directors. The second stage shows that the extent of female directors does not affect return on assets. However, it does positively affect price to book ratio. This suggests that an increase in female directors is not valued on the short term, but is valued on the long term and that shareholders recognize the added value of more gender diverse boards.

The second part of the research shows that national cultural differences determine the extent of female directors and the relation between the extent of female directors and firm performance. As expected, power distance, masculinity and uncertainty avoidance negatively

affect the extent of female directors, whereas individualism is found not to relate with the extent of female directors while a positive relation was expected. Moreover, we find clear evidence that, after controlling for cultural values, female board participation always has a positive and significant impact on firm performance.

This study shows that national cultural differences matter and potentially explain mixed results in previous literature. Explanation is also provided regarding the decrease in the extent of female directors in individual European countries. For example, Portugal belongs to the upper quartile with respect to high power distance cultures. As this study shows that within such cultures the extent of female directors negatively affects firm performance, it is not surprising to observe that the extent of female directors decreases over time.

From an empirical perspective, this study sheds light on the relationship between the extent of female directors, firm performance and national cultural differences. However, the results also demand future research on a number of issues in addition the relation between female labor participation and the extent of female directors. Firstly, there is a need to develop a solid theoretical framework to better understand heterogeneity and its advantages in the business arena. One aspect is generating empirical research aimed at how the extent of female directors improves board heterogeneity and functioning. Although theory hypothesizes that the extent of female directors improves board functions like monitoring and disciplining function or providing advice and counsel, legitimacy and access to channels for communicating information and obtaining commitments, support or preferential access to resources, little empirical evidence is at hand. This study recognizes the importance of Adams and Ferreira (2009), but more evidence should reveal how gender heterogeneous boards operate differently from homogeneous boards. Secondly, the results show that the extent of female directors does not affect short term firm

performance. Further research could clarify what withholds female directors from adding benefits

to board functions and firm performance instantaneously.

References (to be finalized)

Adams, R. B., and Ferreira, D. 2009. Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics,* 94(2): 291–309.

Adler, N. J. 2002. International Dimensions of Organizational Behavior. Cincinnati, South-Western college publishers.

Akaah, I. P. 1990. Attitudes of marketing professionals toward ethics in marketing research: A cross-national comparison. *Journal of Business Ethics*, 9(1): 45–53.

Anderson, R. C., Reeb, D. M., Upadhyay, A., and Zhao, W. 2011. The economics of director heterogeneity. *Financial Management*, 1(1) : 5-38.

Bøhren, Ø., and Strøm, Ø. 2010. Governance and politics: Regulating independence and diversity in the board room. *Journal of Business Finance and Accounting,* 37(9): 1281-1308.

Campbell, K., and Minguez-Vera, A. 2008. Gender diversity in the board room and firm financial performance. *Journal of Business Ethics,* 83(3): 435-451.

Carter, D. A., D'Souza, F., Simkins, B. J., and Simpson, W. G. 2010. The gender and ethnic diversity of US boards and board committees and firm financial performance. *Corporate Governance: An International Review,* 18(5): 396-414.

Carter, D. A., Simkins, B. J., and Simpson, W. G. 2003. Corporate governance, board diversity and firm value. *Financial Review,* 38(1): 33-53.

Catalyst. 2007. Catalyst census of women board directors of the FP500: Voices from the board room. Catalyst, New York.

Certo, S. T. 2003. Influencing initial public offering investors with prestige: Signaling with board structures. *Academy of Management Review,* 28: 432-446.

Chang, A. W., and Cheung, H. Y. 2008. Common cultural relationships in corporate governance across developed and emerging financial markets. *Applied Psychology: an International Review,* 57(2): 225-245.

Croson, R., and Gneezy, U. 2009. Gender differences in preferences. *Journal of Economic Literature,* 47(2): 448-474.

Daily, C. M., and Schwenk, C. 1996. Chief executive officers, top management teams, and boards of directors: Congruent or countervailing forces? *Journal of Management*, 22: 185-208.

Davis, G. F., and Mizruchi, M. S. 1999. The money center cannot hold: Commercial banks in the U.S. system of corporate governance. *Administrative Science Quarterly,* 44: 215-239.

Demsetz, H., and Lehn, K. 1985. The structure of corporate ownership: Causes and consequences. *The Journal of Political Economy,* 93(6): 1155-1177.

Der Spiegel 2013. Gender equality: ECB to double number of women in top roles. http://www.spiegel.de/international/europe/ecb-to-introduce-women-quota-in-top-management-positions-a-919228.html (accessed 12 September 2013).

Dowling, J. B., and Pfeffer, J. 1975. Organizational legitimacy: Social values and organizational behavior. *Pacific Sociological Review,* 18(1): 122-136.

Eisenhardt, K. M. 1989. Agency theory: An assessment and review. *Academy of Management Review,* 14(1): 57-74.

Erhardt, N. L., Werbel, J. D., and Shrader, C. B. 2003. Board of director diversity and firm financial performance. *Corporate Governance,* 11(2): 102-111.

Fama, E. F. 1980. Agency problems and the theory of the firm. *Journal of Political Economy,* 88(2): 288-307.

Fama, E. F., and Jensen, M. C. 1983. Separation of ownership and control. *Journal of Law and Economics,* 26(2): 301-325.

Farrel, K. A., and Hersch, P. L. 2005. Additions to corporate boards: The effect of gender. *Finance Department Faculty Publications,* Paper 18.

Haunschild, P. R., and Beckman, C. M. 1998. When do interlocks matter? Alternate sources of information and interlock influence. *Administrative Science Quarterly,* 43: 815-844.

Hermalin, B. E., and Weisbach, M. S. 1998. Endogenously chosen boards of directors and their monitoring of the CEO. *American Economic Review,* 88(1): 96-118.

--- . 2003. Boards of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review,* April: 7-26.

Hillman, A., Canella Jr., A. A., and Harris, I. C. 2002. Women and racial minorities in the boardroom: How do directors differ? *Journal of management,* 28: 747-763.

Hillman, A. J., and Dalziel, T. 2003. Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review,* 28(3): 383-396.

Hillman, A. J., Shropshire, C., and Cannella Jr., A. A. 2007. Organizational predictors of women on corporate boards. *Academy of Management Journal,* 50(4): 941-952.

Hofstede, G. 1980. *Culture's consequences: International differences in work-related values.* Sage Publications, Beverly Hills CA.

--- . 2001. *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations.* Thousand Oaks, CA, Sage.

House, R. J., Hanges, P., Javidan, M., Dorfmann, P., and Gupta, V. 2004. *Culture, leadership and organizations: The GLOBE Study of 62 nations.* Sage, Thousand Oaks, CA.

Jensen, M. C., and Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics,* 3(4): 305–360.

Kanner, B. 2004. *Pocketbook power.* New York: McGraw-Hill.

Kluckhohn, C. 1962. *Culture and Behavior.* New York: The Free Press of Glencoe

Kor, Y. Y., and Misangyi, V. F. 2008. Outside directors' industry-specific experience and firms' liability of newness. *Strategic Management Journal*, 29: 1345-1355.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., and Vishny, R. W. 1998. Law and finance. *Journal of Political Economy,* 106(6): 1113-1156.

Licht, A. N. 2001. The mother of all path dependencies: Toward a cross cultural theory of corporate governance system. *Delaware Journal of Corporate Law,* 26(1): 147-205.

Lückerath-Rovers, M. 2011. Women on boards and firm performance. *Journal of Management and Governance,* DOI: 10.1007/s10997-011-9186-1

McKinsey and Company. 2007. *Women matter. Gender diversity, a corporate performance driver.* Paris: McKinsey and Company.

Miller, T., and Del Carmen Triana, M. 2009. Demographic diversity in the board room: Mediators of the board diversity – firm performance relationship. *Journal of Management Studies,* 46(5): 755-786.

Parsons, T., and Shils, E. A. 1951. *The general theory of action. Toward a general theory of action: Theoretical foundations for the social sciences.* Harvard University Press, N. J. Smelser.

Pelled, L. H., Eisenhardt, K, M., and Xin, K. R. 1999. Exploring the black box: An analysis of work group diversity, conflict, and performance. *Administrative Science Quarterly,* 44: 1-28.

Pfeffer, J. 1972. Size and composition corporate boards of directors: The organization and its environment. *Administrative Science Quarterly,* 17(2): 218-228.

Pfeffer, J., and Salancik, G. R. 1978. *The external control of organizations: A resource dependence perspective.* Stanford, CA: Stanford Business Books.

Reding, V. 2011/03/01. Quotas de femmes dans les conceils: Pourquoi pas? *Les Echos,* 17.

Rose, C. 2007. Does female representation influence firm performance? The Danish evidence. *Corporate Governance,* 15(2): 404-413.

Singh, V., Vinnicombe, S., and Johnson, P. 2001. Women directors on top UK boards. *Corporate Governance,* 9(3): 206-216.

Smith, N., Smith, V., and Verner, M. 2006. Do women in top management affect firm performance? A panel study of 2.500 Danish firms. *International Journal of Productivity and Performance Management,* 55(7): 569-593.

Stearns, L. B., and Mizruchi, M. S. 1993. Board composition and corporate financing: The impact of financial institution representation on borrowing. *Academy of Management Journal,* 36(3): 603-618.

Storvik, A., and Teigen, M. 2010. Women on board. The Norwegian experience. In J. Steinhilber and M. Schneider (Eds.), *International Policy Analysis.* Berlin: Friedrich-Ebert-Stiftung.

Taras, V., Steel, P., and Kirkman, B. L. 2012. Improving national cultural indices using a longitudinal meta-analysis of Hofstede's dimensions. *Journal of World Business,* 47: 329-341.

Van der Walt, N., and Ingley, C. 2003. Board dynamics and the influence of professional background, gender, and ethnic diversity of directors. *Corporate Governance,* 11(3): 218-234.

Van Ees, H., Postma, T. J. B. M., and Sterken, E. 2003. Board characteristics and corporate performance in the Netherlands. *Eastern Economic Journal,* 29(1): 41-58.

Werdigier, J. 2011/02/25. Britain joins calls to close board room gender gap. *International Herald Tribune,* 20.

Table I
Percentage of female directors for 19 European countries in the period 2004 to 2011

	2004	2005	2006	2007	2008	2009	2010	2011
Austria	2.5	2.2	2.8	3.4	3.7	3.4	4.0	5.6
Belgium	4.1	2.7	3.1	3.6	4.6	6.0	7.2	7.3
Cyprus	11.6	8.6	8.8	7.6	9.4	8.4	7.3	8.9
Denmark	4.4	4.6	5.5	5.2	5.9	6.6	7.9	8.1
Finland	7.6	8.9	8.7	9.2	10.1	12.2	15.4	16.3
France	6.0	6.2	6.5	6.7	7.4	7.7	8.9	10.7
Germany	5.1	5.8	4.3	4.6	4.1	4.1	5.0	5.6
Greece	9.4	6.7	6.1	4.5	6.6	6.5	6.9	5.6
Ireland	5.0	4.6	5.5	5.3	4.7	5.2	5.4	6.7
Italy	5.5	5.3	4.9	5.0	4.8	5.1	4.8	4.8
Luxembourg	3.1	2.1	2.2	4.2	4.1	4.3	4.7	5.2
Netherlands	4.8	4.5	4.7	4.4	4.9	5.5	5.7	6.5
Norway	17.5	23.3	29.4	34.2	35.9	34.2	35.7	35.1
Portugal	7.3	8.1	7.0	5.3	3.5	4.4	4.0	4.3
Spain	4.8	4.8	7.1	6.0	7.2	7.9	8.1	7.6
Sweden	15.3	16.3	18.7	19.1	18.5	19.2	21.4	21.7
Switzerland	5.1	4.4	4.5	4.4	4.5	4.7	4.6	5.0
Turkey	7.2	6.6	5.9	5.8	5.2	6.2	6.6	6.3
United Kingdom	5.2	5.6	6.0	6.1	6.2	6.4	6.9	7.7
Other	1.4	2.6	7.4	5.7	7.7	7.6	8.2	7.4
Total	6.6	6.7	7.5	7.5	7.9	8.3	8.9	9.3

Table II

Definition of board, firm and country characteristics for 19 European countries in the period 2004 to 2011

	Definitions	Source
Board characteristics		
Number of females	Total number of female directors on the board at the end of the year	Capital IQ
Percentage of females	Total number of female directors on the board divided by the total number of board directors at the end of the year	Capital IQ
Female indicator	Dichotomous variable that equals 1 when the board has one or more female directors at the end of the year and 0 otherwise	Capital IQ
Board size	Total number of directors on the board at the end of the year	Capital IQ
Number of directors connected	Total number of directors on the board at the end of the year that have a seat in another firm's board with female directors	Capital IQ
Firm characteristics		
Return on assets (ln)	Natural logarithm of the annual net income divided by the book value of total assets at the end of the year	Orbis
Price to book (ln)	Natural logarithm of the stock price divided by the book value of equity at the end of the year	Orbis
Firm age (ln)	Natural logarithm of the number of years since incorporation	Orbis
Total assets (ln)	Natural logarithm of the book value of total assets at the end of the year	Orbis
Turnover (ln)	Natural logarithm of the total operating revenues at the end of the year	Orbis
Number of employees (ln)	Natural logarithm of the total number of employees at the end of the year	Orbis
Country characteristics		
Female labor participation	Percentage of females active on the labor market	World Bank
Power distance	Dichotomous variable that equals 1 when a firm is headquartered in a country that belongs to the 25% highest scores on the power distance cultural dimension as provided by Hofstede (1980) and 0 otherwise	Taras, Steel and Kirkman
Individualism	Dichotomous variable that equals 1 when a firm is headquartered in a country that belongs to the 25% highest scores on the individualism cultural dimension as provided by Hofstede (1980) and 0 otherwise	Taras, Steel and Kirkman
Masculinity	Dichotomous variable that equals 1 when a firm is headquartered in a country that belongs to the 25% highest scores on the masculinity cultural dimension as provided by Hofstede (1980) and 0 otherwise	Taras, Steel and Kirkman
Uncertainty avoidance	Dichotomous variable that equals 1 when a firm is headquartered in a country that belongs to the 25% highest scores on the uncertainty avoidance cultural dimension as provided by Hofstede (1980) and 0 otherwise	Taras, Steel and Kirkman

Table III
Descriptive statistics for board, firm and country characteristics for
19 European countries in the period 2004 to 2011

	Mean	Stdev	Min	Max	Obs
Board-level characteristics					
Number of females	0.532	0.828	0.000	9.000	17,680
Percentage of females	0.077	0.120	0.000	0.800	17,680
Female indicator dummy	0.374	0.484	0.000	1.000	17,680
Board size	6.623	2.777	3.000	21.000	17,680
Number of directors connected	1.401	1.775	0.000	13.000	17,680
Firm-level characteristics					
Return on assets (ln)	1.654	1.125	-4.605	4.583	22,754
Price to book (ln)	0.348	0.932	-6.908	14.648	22,598
Firm age (ln)	3.295	1.116	0.000	6.290	29,538
Total assets (ln)	12.857	2.253	-2.259	21.674	28,958
Turnover (ln)	12.376	1.998	-1.789	19.711	28,857
Number of employees (ln)	6.967	2.081	0.000	13.369	25,292
Country-level characteristics					
Female labor participation (%)	44.0	4.905	25.412	48.477	27,916
Power distance	0.246	0.430	0.000	1.000	32,000
Individualism	0.831	0.375	0.000	1.000	32,000
Masculinity	0.537	0.499	0.000	1.000	32,000
Uncertainty avoidance	0.422	0.494	0.000	1.000	32,000

Table IV
Pair wise Correlation Matrix

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
[1] Number of females	-												
[2] Percentage of females	0.88	-											
[3] Female indicator	0.82	0.82	-										
[4] Board size	0.34	0.06	0.29	-									
[5] Firm age (ln)	0.02	-0.01	0.01	0.07	-								
[6] Total assets (ln)	0.19	0.08	0.18	0.44	0.19	-							
[7] Turnover (ln)	0.21	0.09	0.19	0.42	0.22	0.87	-						
[8] Number of employees (ln)	0.20	0.09	0.18	0.38	0.23	0.72	0.88	-					
[9] Power distance	-0.02	-0.04	0.00	0.10	0.02	0.16	0.13	0.11	-				
[10] Individualism	-0.04	-0.06	-0.03	0.04	-0.18	-0.18	-0.13	-0.10	-0.27	-			
[11] Masculinity	-0.29	-0.32	-0.25	0.05	-0.06	-0.05	-0.03	-0.02	-0.07	0.22	-		
[12] Uncertainty avoidance	-0.09	-0.10	-0.08	0.02	0.14	0.22	0.18	0.15	0.75	-0.69	0.07	-	
[13] Number of directors	0.35	0.21	0.32	0.47	0.09	0.48	0.51	0.45	0.04	0.07	-0.18	-0.08	-
[14] Female labor participation	0.11	0.10	0.09	0.03	-0.02	-0.08	-0.01	-0.02	-0.28	0.37	-0.21	-0.31	0.15

Table V
First stage regressions: Identification of the extent of female board directors

This table shows the results of the first stage instrumental variables estimations with inclusion of firm-fixed and time-fixed effects. The European sample comprises 19 countries and covers the period 2004 to 2010; data with respect to labor participation is unavailable for the year 2011. Board, firm and country-level characteristics are retrieved from Capital IQ, Orbis and the World Bank Group respectively. Columns 1, 2 and 3 (Columns 4, 5, and 6) show results from estimating the fitted values of the number of female directors, percentage of female directors and female indicator respectively, using two instruments, where return on assets (price to book ratio) is the dependent variable in the second stage and board size, firm age, total assets, turnover and the number of employees are controlled for. Number of females equals the number of female board directors, percentage of females equals the number of female board directors divided by the total number of board directors, and female indicator is a dichotomous variable that equals 1 when a firm has one or more female board directors and 0 otherwise. Number of directors connected equals the total number of board directors that have a seat in other boards with female directors. Female labor participation equals the percentage of female labor participation within the country in which a firm is headquartered. Board size equals the total number of board directors, firm age equals the total number of years since incorporation, total assets equals the book value of total assets, turnover equals the total revenues and the number of employees equals the total number of employees. For all firm-level characteristics the natural logarithm is used and all variables are measured at the end of the year. ***, **, * Represent significance at the 1%, 5% and 10% levels respectively. Robust standard errors are shown in parentheses under the coefficients.

	Number of females	Percentage of females	Female indicator	Number of females	Percentage of females	Female indicator
	(1)	(2)	(3)	(4)	(5)	(6)
Number of directors connected	0.060***	0.005***	0.027***	0.059***	0.005***	0.029***
	(0.007)	(0.001)	(0.005)	(0.008)	(0.001)	(0.005)
Female labor participation	-0.064***	-0.005**	-0.002	-0.068***	-0.005**	-0.003
	(0.015)	(0.002)	(0.011)	(0.015)	(0.002)	(0.010)
Board size	0.083***	-0.001	0.033***	0.083***	-0.001	0.031***
	(0.005)	(0.001)	(0.003)	(0.005)	(0.001)	(0.003)
Firm age (ln)	-0.025**	-0.005	0.016	-0.055*	-0.008	-0.024
	(0.028)	(0.004)	(0.020)	(0.031)	(0.005)	(0.021)
Total assets (ln)	0.040	0.007**	0.026**	0.015	0.001	0.006
	(0.018)	(0.003)	(0.012)	(0.016)	(0.003)	(0.010)
Turnover (ln)	-0.008	0.000	0.008	0.008	0.003	0.007
	(0.017)	(0.002)	(0.011)	(0.013)	(0.002)	(0.008)
Number of employees (ln)	-0.001	0.001	-0.009	0.006	0.002	-0.003
	(0.011)	(0.002)	(0.008)	(0.011)	(0.002)	(0.008)
Number of observations	10,187	10,187	10,187	10,252	10,252	10,252
Number of firms	2,009	2,009	2,009	2,115	2,115	2,115
Centered r^2	0.207	0.036	0.117	0.178	0.025	0.092
p-value Angrist-Pischke	0.000	0.000	0. 000	0.000	0.000	0.000
Kleibergen-Paap F-statistic	41.216	16.810	16.540	37.810	19.610	27.030
p-value Sargan-Hansen	0.347	0.347	0.328	0.667	0.585	0.201

Table VI
Second stage regressions: Firm performance and the extent of female directors in European firms in the period 2004-2010

This table shows the results of the second stage instrumental variables estimations with inclusion of firm-fixed and time-fixed effects. The European sample comprises 19 countries and covers the period 2004 to 2010 (data with respect to labor participation is unavailable for the year 2011). Board, firm and country-level characteristics are retrieved from Capital IQ, Orbis and the World Bank Group respectively. Columns 1, 2 and 3 (Columns 4, 5, and 6) show results from return on assets (price to book ratio) regressed on the instrumented number of female directors, percentage of female directors and female indicator respectively, and where board size, firm age, total assets, turnover and the number of employees are controlled for. Return on assets equals annual net income divided by the book value of total assets. Price to book ratio equals the stock price divided by the book value of equity. The number of females, percentage of females and female indicator are instrumented and result from the first stage. Board size equals the total number of board directors, firm age equals the total number of years since incorporation, total assets equals the book value of total assets, turnover equals the total revenues and the number of employees equals the total number of employees. For all firm-level characteristics the natural logarithm is used and all variables are measured at the end of the year. ***, **, * Represent significance at the 1%, 5% and 10% levels respectively. Robust standard errors are shown in parentheses under the coefficients.

	Return on assets (ln)			Price to book (ln)		
	(1)	(2)	(3)	(4)	(5)	(6)
Number of females	0.031			0.277**		
	(0.150)			(0.115)		
Percentage of females		0.377			3.079**	
		(1.788)			(1.320)	
Female indicator			-0.081			0.521**
			(0.393)			(0.252)
Board size	-0.013	-0.010	-0.007	-0.024**	0.001	-0.017*
	(0.015)	(0.006)	(0.015)	(0.011)	(0.005)	(0.010)
Firm age (ln)	0.044	0.045	0.044	-0.148***	-0.140***	-0.148***
	(0.059)	(0.060)	(0.058)	(0.047)	(0.049)	(0.048)
Total assets (ln)	-0.743***	-0.744***	-0.739***	-0.459***	-0.457***	-0.460***
	(0.052)	(0.053)	(0.054)	(0.084)	(0.084)	(0.084)
Turnover (ln)	0.856***	0.856***	0.856***	0.029	0.023	0.027
	(0.069)	(0.069)	(0.069)	(0.051)	(0.052)	(0.051)
Number of employees (ln)	-0.198***	-0.199***	-0.199***	0.091*	0.087*	0.095*
	(0.033)	(0.031)	(0.032)	(0.049)	(0.049)	(0.049)
Number of observations	10,187	10,187	10,187	10,252	10,252	10,252
Number of firms	2,009	2,009	2,009	2,115	2,115	2,115
Centered r^2	0.147	0.147	0.148	0.343	0.303	0.332

Table VII
First stage regressions: Identification of the extent of female board directors

This table shows the results of the first stage estimations with inclusion of Hofstede's cultural dimensions and a time-fixed effect. The European sample comprises 19 countries and covers the period 2004 to 2010 (data with respect to labor participation is unavailable for the year 2011). Board, firm and country-level characteristics are retrieved from Capital IQ, Orbis and the World Bank Group respectively. Hofstede's standardized scores are retrieved from Taras, Steel and Kirkman (2012). Columns 1, 2 and 3 (Columns 4, 5, and 6) show results from estimating the fitted values of the number of female directors, percentage of female directors and female indicator respectively, using the cultural dimensions power distance, individualism, masculinity, uncertainty avoidance and two instruments, where return on assets (price to book ratio) is the dependent variable in the second stage and board size, firm age, total assets, turnover and the number of employees are controlled for. Number of females equals the number of female board directors, percentage of females equals the number of female board directors divided by the total number of board directors, and female indicator is a dichotomous variable that equals 1 when a firm has one or more female board directors and 0 otherwise. Power distance, individualism, masculinity and uncertainty avoidance are dichotomous variables that equal 1 when a firm is headquartered in a country belonging to the upper quartile with respect to the corresponding cultural dimension, and 0 otherwise. Number of directors connected equals the total number of board directors that have a seat in other boards with female directors. Female labor participation equals the percentage of female labor participation. Board size equals the total number of board directors, firm age equals the total number of years since incorporation, total assets equals the book value of total assets, turnover equals the total revenues and the number of employees equals the total number of employees. For firm-level characteristics the natural logarithm is used and all variables are measured at the end of the year. ***, **, * Represent significance at the 1%, 5% and 10% levels respectively. Robust standard errors are shown in parentheses under the coefficients.

	Number of females	Percentage of females	Female indicator	Number of females	Percentage of females	Female indicator
	(1)	(2)	(3)	(4)	(5)	(6)
Power distance	-0.160***	-0.029***	-0.033	-0.192***	-0.035***	-0.047**
	(0.032)	(0.005)	(0.020)	(0.032)	(0.005)	(0.020)
Individualism	-0.012	0.002	-0.022	0.014	0.007	-0.014
	(0.042)	(0.006)	(0.026)	(0.040)	(0.006)	(0.025)
Masculinity	-0.441***	-0.069***	-0.211***	-0.462***	-0.073***	-0.218***
	(0.022)	(0.003)	(0.012)	(0.022)	(0.003)	(0.012)
Uncertainty avoidance	-0.214***	-0.028***	-0.131***	-0.213***	-0.028***	-0.125***
	(0.025)	(0.004)	(0.017)	(0.025)	(0.004)	(0.017)
Number of directors connected	0.081***	0.010***	0.046***	0.088***	0.011***	0.050***
	(0.006)	(0.001)	(0.003)	(0.006)	(0.001)	(0.003)
Female labor participation	0.006*	0.001	0.003	0.000	0.000	0.000
	(0.003)	(0.001)	(0.002)	(0.003)	(0.001)	(0.002)
Board size	0.076***	0.000	0.036***	0.076***	-0.001	0.035***
	(0.004)	(0.000)	(0.002)	(0.004)	(0.000)	(0.002)
Firm age (ln)	-0.020***	-0.003***	-0.011***	-0.021***	-0.004***	-0.014***
	(0.006)	(0.001)	(0.004)	(0.006)	(0.001)	(0.004)
Total assets (ln)	-0.008	0.000	-0.002	-0.007	0.000	-0.003
	(0.007)	(0.001)	(0.004)	(0.007)	(0.001)	(0.004)
Turnover (ln)	-0.012	-0.001	0.003	-0.016	-0.002	0.003
	(0.011)	(0.002)	(0.007)	(0.011)	(0.002)	(0.006)
Number of employees (ln)	0.029***	0.003***	0.007	0.026***	0.003**	0.005
	(0.008)	(0.001)	(0.005)	(0.008)	(0.001)	(0.005)
Constant	0.013***	0.077***	0.048	0.762***	0.171***	0.319
	(0.157)	(0.028)	(0.107)	(0.471)	(0.063)	(0.214)
Number of observations	10,365	10,365	10,365	10,406	10,406	10,406
Centered r^2	0.212	0.106	0.167	0.215	0.109	0.169

Table VIII
Second stage regressions: Firm performance and the extent of female directors in European firms with Hofstede's cultural dimensions, 2004-2010

This table shows the results of the second stage instrumental variables estimations with inclusion of Hofstede's cultural dimensions and a time-fixed effect. The European sample comprises 19 countries and covers the period 2004 to 2010 (data with respect to labor participation is unavailable for the year 2011). Board, firm and country-level characteristics are retrieved from Capital IQ, Orbis and the World Bank Group respectively, and Hofstede's standardized scores from Taras, Steel and Kirkman (2012). Columns 1, 2 and 3 (Columns 4, 5, and 6) show results from return on assets (price to book ratio) regressed on the instrumented number of female directors, percentage of female directors and female indicator respectively and the cultural dimensions power distance, individualism, masculinity, uncertainty avoidance. Additionally, board size, firm age, total assets, turnover and the number of employees are controlled for. Return on assets equals annual net income divided by the book value of total assets. Price to book ratio equals the stock price divided by the book value of equity. The number of females, percentage of females and female indicator are instrumented and result from the first stage. Power distance, individualism, masculinity and uncertainty avoidance are dichotomous variables that equal 1 when a firm is headquartered in a country belonging to the upper quartile with respect to the corresponding cultural dimension, and 0 otherwise. Board size equals the total number of board directors, firm age equals the total number of years since incorporation, total assets equals the book value of total assets, turnover equals the total revenues and the number of employees equals the total number of employees. For all firm-level characteristics the natural logarithm is used and all variables are measured at the end of the year. ***, **, * Represent significance at the 1%, 5% and 10% levels respectively. Robust standard errors are shown in parentheses under the coefficients.

	Return on assets (ln)			Price to book (ln)		
	(1)	(2)	(3)	(4)	(5)	(6)
Number of females	0.638***			0.481***		
	(0.095)			(0.077)		
Percentage of females		5.310***			3.994***	
		(0.774)			(0.646)	
Female indicator			1.124***			0.843***
			(0.159)			(0.132)
Power distance	0.109**	0.159***	0.044	0.130***	0.177***	0.078*
	(0.051)	(0.056)	(0.050)	(0.043)	(0.049)	(0.041)
Individualism	-0.023	-0.037	-0.003	-0.240***	-0.253***	-0.222***
	(0.058)	(0.061)	(0.057)	(0.053)	(0.054)	(0.052)
Masculinity	0.224***	0.309***	0.178***	0.171***	0.237***	0.133***
	(0.054)	(0.066)	(0.047)	(0.046)	(0.057)	(0.040)
Uncertainty avoidance	-0.018	-0.003	-0.007	-0.048	-0.042	-0.046
	(0.047)	(0.049)	(0.048)	(0.036)	(0.038)	(0.037)
Board size	-0.028***	0.022***	-0.020**	-0.020***	0.018***	-0.014**
	(0.010)	(0.004)	(0.008)	(0.007)	(0.004)	(0.006)
Firm age (ln)	-0.015	-0.009	-0.015	-0.059***	-0.054***	-0.056***
	(0.010)	(0.010)	(0.010)	(0.008)	(0.009)	(0.008)
otal assets (ln)	-0.425***	-0.432***	-0.428***	-0.173***	-0.178***	-0.174***
	(0.011)	(0.012)	(0.011)	(0.008)	(0.009)	(0.008)
Turnover (ln)	0.500***	0.500***	0.490***	0.168***	0.168***	0.158***
	(0.019)	(0.019)	(0.019)	(0.029)	(0.028)	(0.030)
Number of employees (ln)	-0.147***	-0.146***	-0.137***	0.020	0.021	0.028
	(0.012)	(0.013)	(0.012)	(0.020)	(0.020)	(0.021)
Constant	1.970***	1.594***	1.946***	0.479*	0.219	0.568**
	(0.113)	(0.121)	(0.115)	(0.249)	(0.232)	(0.222)
Number of observations	10,365	10,365	10,365	10,406	10,406	10,406
Centered r^2	0.034	-0.077	0.011	0.036	-0.060	0.030

APPENDIX

Table A.I
Descriptive statistics for board, firm and country characteristics for 19
European countries in the period 2004 to 2011, decomposed by year

	Mean	*Stdev*	*Median*	*Min*	*Max*	*Obs*
Number of females						
2004	0.374	0.666	0.000	0.000	5.000	1,548
2005	0.409	0.694	0.000	0.000	5.000	1,797
2006	0.456	0.740	0.000	0.000	5.000	2,021
2007	0.490	0.800	0.000	0.000	7.000	2,251
2008	0.522	0.823	0.000	0.000	7.000	2,377
2009	0.559	0.852	0.000	0.000	9.000	2,492
2010	0.629	0.903	0.000	0.000	8.000	2,570
2011	0.694	0.942	0.000	0.000	8.000	2,624
Average 2004-2011	0.532	0.828	0.000	0.000	9.000	17,680
Percentage of females						
2004	0.063	0.115	0.000	0.000	0.750	1,548
2005	0.066	0.115	0.000	0.000	0.750	1,797
2006	0.071	0.118	0.000	0.000	0.750	2,021
2007	0.073	0.120	0.000	0.000	0.750	2,251
2008	0.075	0.121	0.000	0.000	0.750	2,377
2009	0.078	0.119	0.000	0.000	0.750	2,492
2010	0.086	0.124	0.000	0.000	0.800	2,570
2011	0.092	0.125	0.000	0.000	0.750	2,624
Average 2004-2011	0.077	0.120	0.000	0.000	0.800	17,680
Female indicator						
2004	0.293	0.455	0.000	0.000	1.000	1,548
2005	0.317	0.465	0.000	0.000	1.000	1,797
2006	0.342	0.474	0.000	0.000	1.000	2,021
2007	0.348	0.477	0.000	0.000	1.000	2,251
2008	0.366	0.482	0.000	0.000	1.000	2,377
2009	0.390	0.488	0.000	0.000	1.000	2,492
2010	0.422	0.494	0.000	0.000	1.000	2,570
2011	0.455	0.498	0.000	0.000	1.000	2,624
Average 2004-2011	0.374	0.484	0.000	0.000	1.000	17,680
Board size						
2004	5.905	2.455	5.000	3.000	18.000	1,548
2005	6.075	2.564	6.000	3.000	17.000	1,797
2006	6.288	2.648	6.000	3.000	17.000	2,021
2007	6.490	2.742	6.000	3.000	20.000	2,251
2008	6.722	2.770	6.000	3.000	21.000	2,377
2009	6.849	2.802	6.000	3.000	21.000	2,492
2010	7.007	2.895	7.000	3.000	21.000	2,570
2011	7.112	2.898	7.000	3.000	19.000	2,624
Average 2004-2011	6.623	2.777	6.000	3.000	21.000	17,680

Table A.I
Continued

	Mean	Stdev	Median	Min	Max	Obs
Number of board directors having a seat in other board with female directors						
2004	1.012	1.445	0.000	0.000	10.000	1,548
2005	1.116	1.548	1.000	0.000	10.000	1,797
2006	1.261	1.665	1.000	0.000	10.000	2,021
2007	1.331	1.727	1.000	0.000	10.000	2,251
2008	1.430	1.778	1.000	0.000	12.000	2,377
2009	1.504	1.841	1.000	0.000	12.000	2,492
2010	1.599	1.906	1.000	0.000	12.000	2,570
2011	1.673	1.933	1.000	0.000	13.000	2,624
Average 2004-2011	1.401	1.775	1.000	0.000	13.000	17,680
Return on assets (ln)						
2004	1.690	1.065	1.850	-4.605	4.350	2,695
2005	1.743	1.061	1.920	-4.605	4.435	3,001
2006	1.798	1.047	1.960	-3.912	4.525	3,280
2007	1.817	1.034	1.957	-4.605	4.583	3,399
2008	1.576	1.201	1.787	-4.605	4.494	2,770
2009	1.439	1.199	1.641	-4.605	4.467	2,644
2010	1.510	1.188	1.746	-4.605	4.289	2,981
2011	1.569	1.176	1.802	-4.605	4.331	1,984
Average 2004-2011	1.654	1.125	1.845	-4.605	4.583	22,754
Price to book ratio (ln)						
2004	0.193	0.765	0.032	-1.760	1.521	21
2005	0.657	0.928	0.623	-6.908	14.648	2,625
2006	0.728	0.849	0.711	-6.908	13.998	2,983
2007	0.630	0.840	0.599	-4.510	6.676	3,531
2008	-0.025	0.931	-0.053	-4.269	6.267	3,563
2009	0.150	0.867	0.128	-4.510	5.641	3,588
2010	0.239	0.902	0.219	-4.343	7.389	3,599
2011	0.163	0.920	0.111	-5.521	4.813	2,688
Average 2004-2011	0.348	0.932	0.333	-6.908	14.648	22,598
Firm age (ln)						
2004	3.214	1.188	3.258	0.000	6.277	3,496
2005	3.214	1.194	3.258	0.000	6.279	3,579
2006	3.221	1.188	3.219	0.000	6.280	3,657
2007	3.233	1.176	3.258	0.000	6.282	3,730
2008	3.280	1.123	3.258	0.000	6.284	3,762
2009	3.342	1.054	3.296	0.000	6.286	3,767
2010	3.396	1.003	3.332	0.000	6.288	3,772
2011	3.445	0.960	3.367	0.000	6.290	3,775
Average 2004-2011	3.295	1.116	3.296	0.000	6.290	29,538

(continued)

Table A.I
Continued

	Mean	Stdev	Median	Min	Max	Obs
Total assets (ln)						
2004	12.585	2.309	12.280	-1.962	20.843	3,281
2005	12.673	2.286	12.348	-2.259	21.023	3,532
2006	12.738	2.226	12.402	-1.855	21.175	3,842
2007	12.855	2.169	12.509	7.013	21.674	3,991
2008	12.860	2.196	12.526	3.871	21.646	3,959
2009	12.849	2.223	12.524	5.823	21.445	3,935
2010	12.946	2.240	12.593	4.754	21.415	3,876
2011	13.516	2.325	13.319	6.901	21.495	2,542
Average 2004-2011	12.857	2.253	12.523	-2.259	21.674	28,958
Turnover (ln)						
2004	12.174	2.090	11.986	-1.735	19.087	3,255
2005	12.214	2.083	11.996	-1.789	19.377	3,518
2006	12.282	1.982	12.022	-1.489	19.305	3,836
2007	12.403	1.852	12.084	9.707	19.304	3,997
2008	12.398	1.924	12.120	4.180	19.613	3,938
2009	12.324	1.967	12.060	0.991	19.081	3,918
2010	12.423	1.993	12.201	2.944	19.434	3,863
2011	12.934	2.071	12.788	1.669	19.711	2,532
Average 2004-2011	12.376	1.998	12.129	-1.789	19.711	28,857
Number of employees (ln)						
2004	6.906	2.103	6.763	0.000	12.973	2,841
2005	6.868	2.127	6.731	0.000	13.127	2,947
2006	6.881	2.074	6.711	0.000	13.162	3,203
2007	6.942	2.050	6.764	0.000	13.193	3,344
2008	6.996	2.011	6.792	0.000	13.277	3,469
2009	6.933	2.056	6.732	0.000	13.293	3,562
2010	6.948	2.086	6.799	0.000	13.332	3,543
2011	7.347	2.141	7.281	0.000	13.369	2,383
Average 2004-2011	6.967	2.081	6.802	0.000	13.369	25,292
Percentage female labor participation						
2004	43.592	5.081	45.442	25.460	47.714	3,989
2005	43.708	5.113	45.693	25.412	48.024	3,989
2006	43.876	5.032	45.683	25.794	47.943	3,989
2007	43.946	5.014	45.617	25.907	48.007	3,989
2008	44.084	4.905	45.676	26.433	47.823	3,989
2009	44.335	4.686	45.763	27.557	48.477	3,989
2010	44.460	4.409	45.935	28.693	47.838	3,989
2011	-	-	-	-	-	-
Average 2004-2011	44.000	4.905	45.676	25.412	48.477	27,923