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Can Board Gender Diversity Promote Corporate Social Performance?

ABSTRACT

Purpose: This paper examines if gender diversity on corporate boards promotes corporate social performance across industries and across countries.

Methodology: Fixed-effect panel models are estimated using European-wide data from 2002 through 2013. Instrumental variable estimation and propensity score matching are also employed to control for potential endogeneity.

Findings: Board gender diversity improves environmental and social performance, and consequently the corporate social performance. Although the positive effect of gender diversity is prevalent across industries, the effect is more pronounced for firms in emerging markets.

Regulatory implications: The findings suggest that gender law that fosters gender diversity can promote corporate social performance in firms and the benefit can be enjoyed with just an introduction of one female director to the board. Promotion of gender diversity in Europe is most beneficial in emerging markets.

Originality: The results provide new insights to the literature as we find that a critical mass of female directors on boards is not required to promote corporate social performance. The research also highlights that board gender diversity enhances corporate social performance irrespective of the industry and the effect on corporate social performance is more pronounced in emerging markets where regulations regarding CSR are not so clear-cut.

Keywords: board gender diversity, corporate governance, corporate social performance, panel models, propensity score matching

Paper Type: Research paper

JEL classification: G30, G38, J16, M14

1. Introduction

One of the European Union's founding values is to foster equality between women and men by promoting equal opportunities in corporate board representation and decision making. Countries such as Norway, Italy and Spain have already enforced legislations to promote female representation in the boardrooms, while other countries such as the UK have issued strong recommendations to increase female representation on the male-dominated boardroom.

In the meantime, societal goals are appearing alongside economic goals (Carroll, 2000) and corporations are expected to exhibit environmental ethics and social ethics while maximizing shareholders' wealth. We bring together these emerging themes by studying if board gender diversity (BGD) promotes corporate social performance (CSP).

Resource dependence theory explains that firm performance is dependent upon the resourcefulness of the corporation at the board level. Hillman and Dalziel (2003) describe a corporate board as the source of critical resources for a firm in terms of advice, counsel and addressing pressures from stakeholders. The board's ability to provide critical resources to the corporation that can enrich the strategic decision-making practice depends on the collective experience and expertise of the board members (Bear *et al.,* 2010; Post *et al.,* 2015). Since female directors have different perspectives to CSP than male directors (Burgess and Tharenou, 2002) BGD may enrich the board and broaden boardroom discussions and perspectives, and consequently CSP. Our results show that an increase in BGD improves both environmental and social performance, resulting in an improvement in the aggregate performance.

We also examine if the effect of BGD on CSP varies across countries. Resource dependence theory together with neo institutional theory provides a platform for the investigation. Matten and Moon (2008) show that European countries have a relatively implicit institutional framework towards CSP. This means that individual corporations do not normally articulate their own

versions of social responsibilities. Meanwhile, increasing socially responsible investments and new market indexes focusing on companies' social and environmental performance such as FTSE4Good index are demanding CSP in companies. As a result, what is considered to be acceptable and legitimate CSP is changing at the institutional level, albeit more so in some countries than in others. Consistent with the expectations, we find that the effect of BGD on CSP is stronger in emerging (financial) markets where a relatively informal framework still prevails.

Moreover, companies in industries that are perceived as high environmental/social risk face pressures from various stakeholders to be active in CSP. Therefore, we examine the effect of BGD across industries where firms are classified as operating in industries with high (low) impacts on stakeholders. We find that BGD improves CSP in both high and low impact industries.

Endogeneity is a potential problem in studies examining the relationship between BGD and CSP, and without carefully controlling for endogeneity the results can lead to misleading inferences.[1] Therefore, we employ instrumental variable estimations to address this issue.

Finally, since CSR is a multi-faceted concept (Walls *et al.*, 2012), we examine the effect of BGD on the individual facets, environmental and social performances, as well as the aggregate performance using a large sample of 754 firms from 20 European countries.

The rest of the paper is structured as follows. Section 2 provides the review of literature, section 3 covers the data and methodology, in section 4 the results are explained and section 5 provides evidence from robustness checks. The paper ends in section 6 with discussions and conclusions.

2. Literature and hypotheses

Behavioral studies have documented that females tend to hold attitudes, beliefs, values and perspectives different from their male counterparts (Pelled *et al.,* 1999). Female directors in business tend to exhibit more risk aversion in their business decisions and less likelihood to flout accounting, financial or ethical rules and regulations than their male counterparts (Pierce and Sweeney, 2010; Kyaw *et al*., 2015). Moreover, studies have found that increased female representation on the boards has been associated with an increase in the level of charitable givings (Bernadi and Threadgill, 2010), improved connections with the community (Hillman *et al*., 2002), enhanced organizational practices relating to CSR (Zhang, 2012) and, in particular, environmental performance (Rao *et al*., 2012) and restraint of disreputable practices such as pollution (Bear *et al*., 2010). Landry *et al.* (2016) find that Fortune 500 companies that have a higher female representation on the board are more likely to appear on the list of World's Most Ethical Company. On the other hand, Deschênes *et al.* (2015) explain that if BGD were to present the firm in a positive light while overshadowing firm's bad environmental practices e.g. pollution, the presence of women on the board may not necessarily lead to improvement in environmental practices. In faith that firms adopt CSP to address environmental and social issues, we develop the following hypotheses.

H1a - BGD improves environmental performance (ENP) of a firm.

H1b - BGD improves social performance (SOP) of a firm.

H1c - BGD improves CSP of a firm.

Neo-institutional theory postulates that organizations adopt institutionalized forms of behavior to enhance their internal and external legitimacy (Scott, 1995). Corporations make decisions within a broader social context. This may, for example, be done by benchmarking against prevailing norms or existing practices thereby making a corporation being on par with competitors, in conformity with regulators and responding to the normative understandings of stakeholder groups (Jackson and Apostolakou, 2010).

Corporations are subject to the institutional context at two levels: country level and industry level. At country level, according to institutional theory, corporations can be viewed as embedded in a nexus of formal and informal framework. The implicit institutional framework widely accepted in Europe enables corporations to enact CSR policies, programs and practices without explicit articulations (Matten and Moon, 2008). However, in the European countries that have developed their financial markets, companies also face new norms and incentives. With rising socially responsible investments and market indexes focusing on firm environmental and social performances such as FTSE4Good index, a growing number of companies in developed markets strive to include CSP as a corporate goal with social performance indicators explicitly articulated (Jackson and Apostolakou, 2010). Chih *et al.* (2008) report that while a high proportion of firms in the developed markets are included in the FTSE4Good Global Index[2], only a very few proportion of firms from the emerging markets are in the index. Thus, outside of the developed markets where the institutional context does not give more incentive and opportunity for corporations to take explicit responsibility, it is expected that gender diversity will have a more positive impact on CSP. Accordingly, we formulate the hypotheses below.

H2a – The effect of BGD on ENP is more positive for firms listed in the emerging markets.

H2b - The effect of BGD on SOP is more positive for firms listed in the emerging markets.

H2c - The effect of BGD on CSP is more positive for firms listed in the emerging markets.

Additionally, corporations face institutional pressures at the industry level. While firms in the same industry face similar environmental and social challenges, the level of environmental and social challenges is more prominent in certain industries (Berrone and Gomez-Mejia, 2009). For instance, oil and gas companies are subject to a high monitoring from activist groups, tight laws and regulations (Liao *et al*., 2014) and may exhibit a higher CSR reporting (Khan, 2016). Thus, to the extent that the environmental and social performance in those industries captures the outcomes of voluntary and explicit CSR initiatives to address the pressures from stakeholders, CSP in high environmental and social impact industries will reflect the nature of the industry

(Berrone and Gomez-Mejia, 2009). However, Jacskon and Apostolakou (2010) state that "CSR may, thus, become an institutionalized feature of sectoral governance structures". There is no particular reason to believe that female directors may bring better discussions and perspectives to the boardrooms in some industries than in the others. Therefore, the following hypotheses were developed.

H3a - Irrespective of the industry a firm belongs to, BGD improves ENP.

H3b - Irrespective of the industry a firm belongs to, BGD improves SOP.

H3c - Irrespective of the industry a firm belongs to, BGD improves CSP.

3. Research design

Sample and data

We construct our sample by combining and matching data from various databases. For the period from 2002 through 2013, we first collect environmental, social and governance data (ESG) of firms in Europe from Thomson Reuters ASSET4 (ASSET4) available through DataStream. ESG data from ASSET4 is most commonly used by investment professionals with assets under management in excess of €2.5 trillion (Ioannou and Serafeim, 2012). ASSET4 employs trained research analysts who collect 900 evaluation points per firm from publicly available sources such as the stock exchange filings, CSR and annual reports, and non-governmental organizations' websites. The analysts access CSR information on all listed firms irrespective of its degree of detail or firms' marketing strategies, thus minimizing sample selection bias.

After collecting the evaluation points across countries with varying reporting standards, the analysts transform them into consistent units to allow for quantitative analyses of the qualitative data. Subsequently, an equal-weighted framework is used to convert the evaluation points into 250 key performance indicators, which are then further organized into 18 categories within 4

dimensions: (1) corporate governance performance, (2) economic performance, (3) environmental performance, and (4) social performance.

Second, we collect financial and accounting data from DataStream and Worldscope, respectively. To be included in the sample, a firm must be a non-financial firm, and has annual financial, accounting and board data as well as the CSR data available. While the initial dataset consisted of 754 firms, the application of the criteria reduced the number of firms to 589. Additionally, our panel data is not balanced; the number of firms with available CSR scores data increases over the years.

Our CSP variables are:

ENP: performance score on environmental dimension. It measures a firm's impact on living and non-living natural systems, including the air, land, and water, as well as complete ecosystems;

SOP: performance score on social dimension. It measures a firm's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices;

CSP[3]: the arithmetic average of the environmental and social scores.

Independent variables

Our variable of interest, BGD, is measured as the percentage of female directors on the board, *gender*. Based on social impact theory, Westphal and Milton (2000) argue that diversity on the board can lower social cohesion through creation of social barriers, which in turn reduces the probability that minority viewpoints will make an impact on the board's decisions. Liu *et al.* (2014) find evidence that when it concerns financial performance, majority representation appears to have failed to hear the voices of minority representation. To investigate if the

proportion of female representation matters, we construct an indicator variable, *dgender*, which takes on the value 1 if a board has at least one female director and 0 otherwise.

Furthermore, indicator variables are constructed to explore the industry and country effects. To investigate the industry effect, we construct, following Jackson and Apostolakou (2010), an indicator variable, *dindustry*, which takes on the value 1 if a corporation belongs to Basic Materials, Oil and Gas, and Utilities, industries that have high impacts on stakeholders and 0 otherwise (Consumer Goods, Consumer Services, Healthcare, Industrials, Technology, and Telecommunications).[4] The country effect is explored through the indicator variable, *demer,* that takes on the value 1 if a firm is listed in an emerging market and 0 otherwise.[5]

Control variables

Previous studies have shown that BGD can act as a substitute for board governance (Adams and Ferreira, 2009; Gul *et al.,* 2011). Accordingly, we include two governance variables. First, board independence, *independence*, measured by the percentage of strictly independent board members is included in our analyses. A director is strictly independent if he/she is not employed by the company, not representing or employed by a majority shareholder, not served on the board for more than ten years, not a reference shareholder with more than 5% of holdings, without cross-board membership or recent/immediate family ties to the corporation, and has not accepted any compensation other than compensation for board service. Second, duality of the roles between the board chairman and the CEO, *duality,* is an indicator variable equal to 1 if the CEO is simultaneously the board chairman and 0 otherwise.

Besides, firms with high growth or high leverage are more likely to be analyzed by providers of external finance, such as creditors, who may exercise pressure to reduce the resources allocated to pursuing CSR (Clarkson *et al.,* 2008). Thus, we include two additional control variables to account for firm growth, *growth*, as measured by the price to book value of firm equity and leverage,

leverage, as measured by the ratio of total debt to total assets. Furthermore, Humphrey *et al.* (2012) find that firm profitability can affect the level of resources available to finance CSR activities. Thus, in our regression models we include *profitability* as measured by the return on assets, i.e. the ratio of earnings before interest expense and income taxes to total assets. Previous CSR research has consistently shown that CSP is influenced by firm size (Dhaliwal *et al.*, 2011; Borghesi *et al.*, 2014). Hence, we include firm size, *size*, measured as the natural logarithm of market value of equity.

Finally, we control for time effects by including *dtime,* an indicator variable equal to 1 if the year is in the period 2008-13 and 0 otherwise.

Model

We estimate the panel data using the model below.

$$y_{it} = \mathbf{x}_{it}'\boldsymbol{\beta} + v_{it} + u_{it} \qquad i = 1,\ldots,N; \quad t = 1,\ldots,T \tag{1}$$

where y_{it} is our dependent variable for firm *i* at time *t*, $\boldsymbol{X}_{\mathrm{it}}$ is a vector of covariates, v_{it} indicates an unobservable time-constant firm effect, u_{it} is an idiosyncratic error term, and $\boldsymbol{\beta}$ is a vector of coefficients to be estimated. To measure the effect of covariates on different scores, we regress each score (*ENP*, *SOP* or *CSP*) on the covariates. We make no a priori assumption about the strict exogeneity of the covariates and estimate equation (1) using several panel estimates, particularly Pooled OLS (P-OLS), Random Effects GLS (RE-GLS) and Fixed Effects OLS (FE-OLS) estimations. From the estimations, we find that there is firm level heterogeneity in the CSP scores as indicated by the significant F-tests on firm fixed effect estimators and the Breusch–Pagan tests while the Hausman test[6] favors the FE-OLS estimator over the RE-GLS estimator. In light of this, we chose the FE estimator with robust standard errors, in all of the panel data models (Gujarati and Porter, 2009).

4. Empirical results

Descriptive statistics

Table 1 reports breakdown of the performance measures by year, industry and country. In particular, Panel A displays the evolution of the average ENP and SOP scores as well as the CSP score and *gender* during the sample period. *CSP* exhibits an upward trend over the period; so do the ENP and SOP scores and *gender*. The increase in the average CSP score from 6.35 in 2002 to 7.15 in 2013 shows that firms on average have improved CSP during the sample period. During the same period, BGD has increased from 5% in 2002 to 18.5% in 2013. The increase of BGD is likely a result of the significant effort of European countries to improve gender diversity in the corporate workforce. Panel B shows the distribution of CSP scores and BGD scores by industry. Telecommunications sector exhibits the most gender diverse board while Utilities sector exhibits the highest level of CSP. Panel C exhibits the distribution of the level of CSP scores and BGD across Europe. France, Finland and Hungary exhibit high level of environmental scores, while the Netherlands, France and Hungary exhibit high level of social scores.

[Insert Table 1 here]

Univariate and bivariate analysis

Table 2 reports descriptive statistics on the sub-groups after dividing the whole sample into two sub-groups based on whether at least one female director is present on the board. Mean difference test statistics reported on the last column show that firms with female director(s) present on the board have an average ENP, SOP and CSP higher than those with no female director on their corporate board by approximately 1.3 z-score points. Moreover, firms with female director(s) present on the board tend to have a higher number of independent directors. According to Adams and Ferreira (2009), firms with female director(s) tend to be larger than

those with no female director are. They also tend to be concentrated in the countries where a regulation towards BGD is in place.

Table 3 reports the correlation matrix between CSP scores, industry, country and governance variables.[7] Firms that score high on ENP tend to score high on SOP, suggesting that firms that perform well on social front tend to perform well on environmental front too.

[Insert Tables 2 and 3 here]

Multivariate analysis

Table 4 reports the estimation results from equation (1) using the FE-OLS estimator, chosen to account for firm specific heterogeneity. Inferences of the analyses in the previous section are generally confirmed here: the coefficient of *gender* in Panel A is positive and statistically significant across all performance measures. These coefficients suggest that an increase in female representation on a corporate board improves ENP, SOP and CSP. This finding is in line with the expectation from our hypotheses H1a, H1b and H1c. In Panel B of Table 4 variable *dgender* is significant in all models, indicating that the presence of at least one female director on the board improves environmental, social and overall performances. This emphasizes the peculiarity of CSR issues. Unlike in the case of firm financial performance, where the number of women directors in a group needs to reach a certain threshold level, the number of women directors does not need to reach the critical mass to promote CSP. With regard to our control variables, the results show that the higher the number of independent directors is, the higher the CSP (SOP) score is. This is in line with the findings in the literature that board independence is an affective governance tool to creating positive value for a company (Adams and Ferreira, 2009; Gul *et al.,* 2011). The lower the profitability or the larger the size is, the higher the CSP (ENP) score is. This last result

supports the findings by Jackson and Apostolakou (2010) who show that larger firms achieve higher levels of CSP as they are likely to receive greater scrutiny from the general public and government. Finally, the positive and significant time dummy (*dtime*) in Table 4 indicates that the ENP, SOP and CSP scores are higher during the period 2008-2013, suggesting that firms are more committed in CSR issues after the onset of the financial crisis.

[Insert Table 4 here]

Industry and country effects

The FE estimator in Table 4 takes into account firm level heterogeneity by including firm level fixed effects; however, the model does not allow an estimation of the effect of any other time-invariant variable such as the industry and country indicator variables (Wooldridge, 2002). Therefore, additional analyses are conducted to investigate the effects of industry and country on the relationship between BGD and CSP. First, we test if the effect of BGD on CSP is heterogeneous across industries and across countries through F-tests. Results reported in Panel A of Table 5 show that while the effect of BGD on CSP scores is not heterogeneous across industries, the same effect is strongly heterogeneous across countries.

To examine the effect further we construct two additional variables: 1) *genderdemer*, the product of the variables *gender* and *demer to test hypotheses H2a-c, and genderdindustry*, the product of the variables *gender* and *dindustry to test hypotheses H3a-c.* Equation (1) is then re-estimated with the new variables as additional covariates. Panel B of Table 5 summarizes the results. First, the coefficient for *genderdemer* is positive and significant across all performance measures, indicating that the effect of gender diversity on ENP, SOP and CSP is stronger for firms in the emerging markets. This confirms our hypotheses H2a-c. Finally, the positive effect of *gender* on ENP, SOP and CSP still remains. Second, the coefficient of *genderdindustry* is insignificant across all performance measures suggesting that the effect of gender diversity on ENP, SOP and CSP of a firm does not depend on the industry which a firm belongs to. These results support our hypotheses H3a-c.

[Insert Table 5 here]

5. Robustness checks

Endogeneity

One potential concern with the results reported in Table 4 is endogeneity. The first possible source for endogeneity is omitted variable bias; however, the use of FE estimator has mitigated this issue (Carter *et al.,* 2010). The second possible source of endogeneity is simultaneity in our variable of interest;[8] in other words, a more socially responsible firm may be more likely to increase its BGD. In order to account for this potential issue, we use instrumental variable (IV)[9] approach, one of the most widely used approaches in addressing simultaneity (Boulouta, 2013). In this approach, variables that are relevant but exogenous to the model are used as instruments. In our case, an instrument is relevant if it is correlated with *gender*, i.e. the endogenous variable, conditional on the other covariates, while exogeneity requires that the instrument is not correlated with the error term in the explanatory equation (conditional on the other covariates), i.e. the instrument does not suffer from the same problem as the original independent variable (i.e *gender*). We use as instrument,[10] *dlaw*, an indicator variable equal to 1 when a regulation towards BGD is in place in the country of the market where the firm is listed and 0 otherwise.[11] This variable allows us to consider not only the presence of a gender regulation but also the timing. In addition, this variable is highly correlated with our endogenous variables yet exogenous to the model.

If the endogenous variables are only weakly correlated with the instruments, estimates from IV regression could be biased. Therefore, we first test for the suitability of our choice of instrument: Cragg-Donald Wald statistic and Kleibergen-Paaprk Wald F statistic are both greater than 10 at 157.535 and 74.376, respectively. Thus, we do not accept the null hypothesis that our instrument

is weak. Table 6 reports results from the IV models. The results show that BGD has a positive effect on firm environmental and social performance. Therefore, even after controlling for the most prevalent sources of endogeneity, the effect of BGD remains as well as that of *profitability, size* and *dtime.*

[Insert Table 6 here]

Treatment effect estimations

As the inclusion of female directors is to an extent voluntary in some part by the companies, there may be selection bias in our sample. We use propensity score matching (PSM) to compare the average CSP of firms that have at least one female director on the board (treatment group) to the average CSP of identical ("twin") firms that have no female director on the board (control group). The control firms are selected based on covariates of firm characteristics ensuring that each firm in the control group has approximately equal probability of being in the treatment group. This process addresses the selection bias and endogeneity. We estimate the treatment effect for the presence of at least one female on the board by using the Nearest-Neighbor matching without replacement. Table 7 shows the PSM results from an unmatched estimator and an average treatment effect of the treated (ATT) estimator for each score. The treatment effect is positive and significant, indicating that CSP scores of firms with female director(s) present on the board are better than those of firms with no female director on the board. The PSM results from Table 7 confirm the finding in Table 4 that an increase in the gender diversity improves CSP.

[Insert Table 7 here]

6. Discussions and conclusions

The effect BGD has on CSP is relatively understudied despite a European-wide effort to promote gender equality in the corporate boardroom. In this paper, we examine the effect BGD can have on firm environmental, social and overall performances. In line with the previous studies (Rao *et al.*, 2012; Zhang, 2012), we find that BGD benefits the society as an increase in female representation on corporate boards leads to improvements in environmental, social and the aggregate performance of the firm. Therefore, creating equal opportunities for different gender in the corporate boards should result in an improvement in firm CSP. Unlike in the case of financial performance studied in the literature, we show that firms do not need to have a threshold number of female directors on board to bring about the improvements.

On one side, we show that a positive relationship between BGD and CSP is prevalent across industries; in particular, we find that BGD improves CSP in both high impact industries such as Oil and Gas industry and low impact industries such as Technology industry. According to Jackson and Apostolakou (2010), sectors represent an important structural boundary within a wider institutional boundary at the country level. On the other side, we show that the BGD-CSP relation is more pronounced in emerging markets where the institutional pressure for a more explicit, proactive and strategic form of CSP is lax. In other words, in emerging countries such as Czech Republic, Greece, Hungary, Poland, and Turkey BGD can be a substitute for the institutionalized pressure for a higher firm commitment in CSR issues.

Moreover, we show that firms with a higher number of independent directors, less profitable firms and bigger firms are more involved with their stakeholders than other firms. At the end, after the financial crisis CSR seems to become a more significant issue for firms.

Our findings have implications for regulators. One approach governments commonly undertake in order to create equal opportunities for both genders in the boardroom is through gender law. Our results suggest that gender law may not only promote equal opportunities but also socially responsible firms. Moreover, a gender law to include just one female director on the corporate boards can bring about improvements in firm CSP. Our results also highlight that a corporate

governance law to induce firms to increase the number of independent directors can bring the same improvement in terms of firm CSP.

Representation of female directors on corporate boards implies a breakthrough in the established ways of thinking that females played a marginal role in terms of board representation. This is especially so in the countries where gender regulations do not exist. Therefore, it will be interesting to investigate the institutional context as well as the characteristics of female directors that bring about the positive effect of gender diversity in the emerging markets. Also of interest is to explore the effectiveness of various formulations of regulations that can promote a better CSP in firms, and not only in large firms, but also in small firms.

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[1] Only Boulouta (2013) addressed the issue of endogeneity in her study and found a positive relationship between BGD and CSP for US firms.
[2] The top five countries with the highest proportion of firms that are included in the FTSE4Good Global Index are: the UK (69.39%), Finland (57.14%), Denmark (56.25%), Germany (50%) and Italy (50%).
[3] In the absence of theoretical guidance on how best to construct the aggregate measure, we construct the CSP score in a similar manner as in Ioannou and Serafeim (2012).
[4] The industry classification derives from DataStream.
[5] The classifications are based on the FTSE market classification.
[6] Breusch-Pagan and Hausman test results are not reported to save space, but they are available upon request.
[7] The tetrachoric technique is used to estimate the correlation between two indicator variables.
[8] Simultaneity or reverse causality arises when the independent variables are a function of the dependent variable or expected values of the dependent variable.
[9] To calculate IV estimates we use two-stage least squares (2SLS) as computational method.
[10] In all three models of the first stage, the coefficient of *dlaw* is statistically significant at 1%.
[11] www.ec.europa.eu.

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Table 1: Sample breakdown.

Panel A

Year	*ENP*	*SOP*	*CSP*	*gender*
2002	6.3977	6.3021	6.3499	4.7936
2003	6.4156	6.2850	6.3503	5.9069
2004	6.2102	6.3416	6.2759	6.0650
2005	6.0240	6.3215	6.1727	7.1223
2006	6.0066	6.2831	6.1449	8.4076
2007	6.1971	6.2882	6.2426	8.9329
2008	6.4208	6.6252	6.5230	9.4393
2009	6.6434	6.7609	6.7022	10.2700
2010	6.7659	6.9460	6.8560	11.3636
2011	6.6680	6.8650	6.7665	13.1216
2012	6.8119	6.9682	6.8901	15.5693
2013	7.0548	7.2381	7.1464	18.5337

Panel B

Industry	*ENP*	*SOP*	*CSP*	*gender*
Basic Materials	7.1969	7.0267	7.1118	10.8861
Consumer Goods	7.0856	6.7592	6.9224	11.0466
Consumer Services	5.4840	6.1584	5.8212	12.1288
Healthcare	5.7515	6.0684	5.9099	10.0643
Industrials	6.7225	6.5418	6.6321	8.0182
Oil and Gas	5.8463	6.6827	6.2645	10.9481
Technology	5.7538	6.0650	5.9094	7.9476
Telecommunications	7.1472	7.6940	7.4206	14.0970
Utilities	7.9417	8.1510	8.0464	8.9945

Panel C

Country	*ENP*	*SOP*	*CSP*	*gender*
Austria	6.9326	6.7956	6.8641	5.5264
Belgium	6.1824	5.6219	5.9021	8.2606
Czech Republic	4.7605	5.7994	5.2799	10.1200
Denmark	6.0124	5.4875	5.7499	9.7643
Finland	7.5403	6.9135	7.2269	19.2318
France	7.7007	7.7982	7.7495	11.1969
Germany	6.9000	6.7787	6.8394	7.4465
Greece	4.8399	5.2473	5.0436	7.3025
Hungary	7.4810	7.7807	7.6308	4.3458
Ireland	3.6750	3.2460	3.4605	4.7801
Italy	6.1169	6.7848	6.4509	3.4343
Netherlands	7.2539	7.8096	7.5318	11.7273
Norway	5.4623	5.7925	5.6274	29.2024
Poland	3.7067	4.0728	3.8898	12.8726
Portugal	7.0404	7.4121	7.2262	1.3443
Spain	7.2553	7.5999	7.4276	7.1821
Sweden	7.1256	6.9671	7.0464	21.4343
Switzerland	6.0744	5.9724	6.0234	6.8003
Turkey	5.3176	4.9908	5.1542	5.9644
United Kingdom	6.0401	6.4541	6.2471	8.8736

Table 1 reports breakdown of performance scores by year, industry and country. *ENP* (*SOP*) is the z-score of a firm relative to that of the universe of firms in the ASSET4 database along environmental (social) dimension. *CSP* is the arithmetic average of *ENP* and *SOP*.

Table 2: Descriptive statistics.

	Whole sample	*At least one female director*			*No female director*			*Difference*	
Variables	Observations	Mean	Median	SD	Mean	Median	SD	T-test	
ENP	754	7.0130	8.1825	2.6338	5.6748	6.0325	2.9183	1.3382	***
SOP	754	7.1541	8.1775	2.5573	5.8614	6.1320	2.7749	1.2927	***
CSP	754	7.0835	8.0075	2.4277	5.7681	6.0230	2.6327	1.3154	***
gender (%)	754	17.0881	14.2900	9.6379	0.0000	0.0000	0.0000	17.0881	***
independence (%)	589	51.0069	54.6700	28.3241	44.6612	45.6100	27.1155	6.3457	***
duality	754	0.2576	0.0000	0.4374	0.2108	0.0000	0.4080	0.0467	**
growth	746	2.4878	2.0600	1.4670	2.4990	2.0700	1.4479	-0.0112	
leverage (%)	751	37.8484	38.5150	19.3883	36.1356	37.3300	20.8007	1.7127	
profitability (%)	751	7.3060	6.5500	4.7981	7.2701	6.5900	4.7059	0.0359	
size	752	8.4129	8.4431	1.3743	7.7136	7.6487	1.2529	0.6994	***
		%			**%**			**%**	
dindustry	754	0.2237	0.0000	0.4168	0.2223	0.0000	0.4159	0.0097	
demer	754	0.0225	0.0000	0.1483	0.0214	0.0000	0.1446	0.0011	
dlaw	754	0.1509	0.0000	0.3580	0.0487	0.0000	0.2152	0.1022	***

Table 2 reports descriptive statistics on variables. The three performance variables are *ENP* (*SOP*), the z-score of a firm relative to that of the universe of firms in the ASSET4 database along environmental (social) dimension, and *CSP*, the arithmetic average of *ENP* and *SOP*. Governance variables include *gender*, the percentage of female directors on the board, *independence*, the percentage of strictly independent board members, and *duality*, an indicator variable that takes on the value 1 if the CEO is simultaneously the chairman and 0 otherwise. Firm level control variables include the price to book value of firm equity (*growth*), the ratio of debt to total assets (*leverage*), the return on assets (*profitability*), and the natural logarithm of firm market value of equity (*size*). Indicator variables include firms from industries that have high impacts on stakeholders (*dindustry*), firms from the emerging markets (*demer*) and firms from countries where gender law exists (*dlaw*). All firm level control variables are winzorised at 1% and 99%. *, **, *** denote statistical significance at 10%, 5% and 1% respectively.

Table 3: Correlation matrix.

Variables	*ENP*	*SOP*	*CSP*	*gender*	*dindustry*	*demer*	*independence*	*duality*	*dlaw*
ENP	1.0000								
SOP	0.7466 ***	1.0000							
CSP	0.9370 ***	0.9320 ***	1.0000						
gender	0.1590 ***	0.1599 ***	0.1707 ***	1.0000					
dindustry	0.0811 ***	0.1071 ***	0.105 ***	0.0151	1.0000				
demer	-0.0868 ***	-0.0906 ***	-0.0949 ***	-0.0160	0.0262 **	1.0000			
independence	0.1791 ***	0.2068 ***	0.2068 ***	0.1158 ***	0.0065	-0.0800 ***	1.0000		
duality	0.0600 ***	0.0616 ***	0.0650 ***	-0.0035	-0.0018	-0.0401 ***	-0.1368 ***	1.0000	
dlaw	0.0811 ***	0.1021 ***	0.0978 ***	0.2565 ***	0.0296 ***	-0.0789 ***	-0.0432 **	0.1457 ***	1.0000

*, **, *** denote statistical significance at 10%, 5% and 1% respectively.

Table 4: Static panel model estimations.

Panel A

	ENP			*SOP*			*CSP*		
Variables	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.
constant	3.5918	0.7409	***	3.0499	0.7162	***	3.3208	0.6113	***
gender	0.0127	0.0060	**	0.0116	0.0053	**	0.0121	0.0048	**
independence	0.0028	0.0018		0.0038	0.0017	**	0.0033	0.0015	**
duality	0.0429	0.1673		0.2842	0.1493	*	0.1635	0.1400	
growth	-0.0576	0.0370		-0.0641	0.0374	*	-0.0609	0.0294	**
leverage	-0.0010	0.0046		0.0053	0.0037		0.0021	0.0035	
profitability	-0.0237	0.0108	**	-0.0136	0.0106		-0.0187	0.0089	**
size	0.3054	0.0964	***	0.3781	0.0925	***	0.3417	0.0791	***
dtime	0.8402	0.0955	***	0.5432	0.0934	***	0.6980	0.0775	***
Firm Fixed Effects	Yes			Yes			Yes		
Regression F/ χ^2	15.99		***	10.92		***	18.58		***
R^2 overall	0.1708			0.2208			0.2284		
Observations	2969			2969			2969		

Panel A of Table 4 reports the estimation results from FE-OLS estimator with firm specific heterogeneity. The variable of interest is *gender* that measures the percentage of female directors on the board. Inference is based on robust standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% respectively.

Panel B

	ENP			*SOP*			*CSP*		
Variables	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.
constant	3.6991	0.7422	***	3.1350	0.7272	***	3.4171	0.6172	***
dgender	0.4498	0.1118	***	0.3858	0.1099	***	0.4178	0.0926	***
independence	0.0028	0.0018		0.0038	0.0017	**	0.0033	0.0015	**
duality	0.0551	0.1669		0.2959	0.1500	**	0.1755	0.1402	
growth	-0.0544	0.0361		-0.0617	0.0374		-0.0580	0.0289	**
leverage	-0.0012	0.0046		0.0052	0.0037		0.0020	0.0035	
profitability	-0.0232	0.0106	**	-0.0132	0.0105		-0.0182	0.0088	**
size	0.2742	0.0968	***	0.3528	0.0947	***	0.3135	0.0801	***
dtime	0.8324	0.0922	***	0.5294	0.0905	***	0.6809	0.0747	***
Firm Fixed Effects	Yes			Yes			Yes		
Regression F/χ^2	18.93		***	11.92		***	20.02		***
R^2 overall	0.1881			0.2330			0.2429		
Observations	2969			2969			2969		

Panel B of Table 4 reports the estimation results from FE-OLS estimator with firm specific heterogeneity. The variable of interest is *dgender*, a variable equal to 1 if there is at least a female on the board and 0 otherwise. Inference is based on robust standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% respectively.

Table 5: Industry and country effects

Panel A

	ENP		*SOP*		*CSP*	
gender (F-test industry effect)	1.46		1.45		1.78	*
gender (F-test country effect)	70.19	***	42.59	***	67.54	***

Panel A of Table 5 reports results from F-tests on the presence of industry and country effects in the relationship between *gender* and *ENP, SOP* or *CSP* *, **, *** denote statistical significance at 10%, 5% and 1% respectively.

Panel B

	ENP			*SOP*			*CSP*		
Variables	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.
constant	3.5525	0.7418	***	3.0365	0.7157	***	3.2945	0.6117	***
gender	0.0161	0.0067	**	0.0127	0.0058	**	0.0144	0.0053	***
genderdindustry	-0.0197	0.0124		-0.0066	0.0137		-0.0131	0.0116	
genderdemer	0.0859	0.0271	***	0.0306	0.0162	*	0.0582	0.0209	***
independence	0.0028	0.0018		0.0038	0.0017	**	0.0033	0.0015	**
duality	0.0553	0.1676		0.2884	0.1503	*	0.1718	0.1407	
growth	-0.0596	0.0370		-0.0648	0.0374	*	-0.0622	0.0295	**
leverage	-0.0013	0.0046		0.0052	0.0037		0.0020	0.0035	
profitability	-0.0242	0.0108	**	-0.0138	0.0106		-0.0190	0.0090	**
size	0.3127	0.0967	***	0.3805	0.0923	***	0.3466	0.0791	***
dtime	0.8486	0.0959	***	0.5418	0.0933	***	0.6952	0.0772	***
Firm Fixed Effects									
Regression F/ χ^2	15.91		***	15.44		***	9.51		***
R2 overall	0.2332			0.1709			0.2199		
Observations	2969			2969			2969		

Panel B of Table 5 summarizes the results from re-estimation of FE-OLS with the interactive variables *genderdindustry* and *genderdemer*. Inference is based on robust standard errors. ***, ** and * denote significance at the 1, 5 and 10 per cent levels.

Table 6: Instrumental variable estimations.

	ENP			*SOP*			*CSP*		
Variables	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.	Coeff.	Std.Err.	Sign.
constant	-	-		-	-		-	-	
gender	0.0501	0.0228	**	0.0377	0.0187	**	0.0439	0.0187	**
independence	0.0018	0.0019		0.0031	0.0018	*	0.0024	0.0016	
duality	-0.0194	0.1741		0.2407	0.1544		0.1106	0.1456	
growth	-0.0439	0.0391		-0.0546	0.0378		-0.0493	0.0311	
leverage	-0.0013	0.0047		0.0051	0.0038		0.0019	0.0036	
profitability	-0.0232	0.0110	**	-0.0133	0.0106		-0.0182	0.0091	**
size	0.2276	0.1192	*	0.3238	0.1067	***	0.2757	0.0981	***
dtime	0.6575	0.1422	***	0.4069	0.1402	***	0.5322	0.1201	***
Regression F/χ^2	16.44		***	11.27		***	18.08		***
Endogeneity test	2.9990		*	1.9960			3.1790		*
Observations	2905			2905			2905		

Table 6 reports the results for the estimation using *dlaw* (dummy variable equal to 1 when a regulation towards BGD is in place in the country of the market where the firm is listed and 0 otherwise) as the instrumental variable to account for the potential issue of simultaneity. Inference is based on robust standard errors. *, **, *** denote statistical significance at 10%, 5% and 1% respectively.

Table 7: Treatment effect estimations.

		Treated	Controls	Difference	Sign.	S.E.	t-stat.
a) *ENP*							
	Umatched	7.0848	5.4901	1.5947	***	0.1009	15.81
	ATT	7.0848	6.4819	0.6029	***	0.2027	2.97
b) *SOP*							
	Umatched	7.2726	5.7371	1.5355	***	0.0963	15.94
	ATT	7.2726	6.7780	0.4946	***	0.1907	2.59
c) *CSP*							
	Umatched	7.1787	5.6136	1.5651	***	0.0913	17.15
	ATT	7.1787	6.6300	0.5488	***	0.1826	3.01

Table 7 reports treatment effect estimations where the treatment group represents the firms with at least one female director on the board. The control group for each firm in the treatment group is chosen using Nearest Neighbor matching algorithm written by Leuven and Sianesi in STATA. *, **, *** denote statistical significance at 10%, 5% and 1% respectively.