



A comparative study between countries on gender diversity, openness and innovation

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Received: February 04, 2022. Revised: February 11, 2022. Accepted: February 25, 2022.

Abstract

Purpose – Diversity subject is rising globally, as the proportion of women in the workforce increased to a large extent and the variety of resources became greater. Diversity attempts have appealed more awareness to the value of female participation in various areas, notably in the boardroom and corporate governance. This study tests the relationships among gender diversity, openness, and innovation, at the firm level across countries from the MOI Survey.

Research design, data, and methodology – In this study the relationships among gender diversity, openness, and innovation were investigated at the firm level across countries from the Management, Organisation, and Innovation (MOI) Survey. A cross-cultural analysis was conducted based on the empirical evidence from six countries: Germany, India, Lithuania, Poland, Romania, and Russia.

Result – The results show that gender diversity is positively related to innovation performance, moreover openness is positively associated with the level of firm innovation. In addition, a company's capability to use knowledge from outside and the creation of new combinations positively influence a firm's potential to innovate.

Conclusion – This study suggests that the more gender-diverse top management team and the higher openness may bring the firm's innovation with greater possibility. the paper encourages more female participation on top management on the grounds of recommending that firms with greater gender diverse top management teams.

Keywords: Gender Diversity, Innovation, Openness, TMT

JEL Classification Code: M14, N10, O36, O57

1. Introduction

Diversity subject is rising globally, as the proportion of women in the workforce increased to a large extent and the variety of resources became greater too (Burke & Nelson, 2002; Cohen and Levinthal, 1990; Holton, 1995; Lundvall, 1992). Diversity attempts have appealed more awareness to the value of female participation in various areas, notably in the boardroom and corporate governance (Adams & Ferreira, 2009; Carter, D'Souza, Simkins, & Simpson, 2010; Shrader, Blackburn, & Iles, 1997). Women are typically underrepresented on boards. In the US, 14.8% of Fortune 500 board positions were taken by female directors in 2007 (Catalyst, 2007). Female board membership in Europe, Australia and Canada were 8.0%, 8.7%, 10.6% respectively (EOWA, 2006; EPWN, 2004).

The recent law enactments in different countries also encourage female board representation. As it happened, in 2005 in Norway public companies (ASAs) effectuated at least 40% of each gender to be presented in their boardroom on the grounds of a quota law passed by Norwegian government (Rasmussen & Huse, 2011). In 2007 in Spain "Law of Equality" was ratified by the Spanish Parliament, which indicates that 40% of directors for a company should be women and it gives a preferential handling to the companies with higher female employment ratio for government contracts too (Wools, 2007). The British Department of Trade and Industry specifically gave advice to engage more women on corporate governance in the UK and endorsed that diversity could increase board effectiveness as well (Higgs, 2003). In the United States the Sarbanes-Oxley Act of 2002 brought on more independence of the corporate directors, this law opened the way for more women to take seats in the boardroom (Miller & Triana, 2009).

In this study the relationships among gender diversity, openness and innovation were investigated at firm level across countries from the Management, Organisation, and Innovation (MOI) Survey. It was conducted by the European Bank for Reconstruction and Development (EBRD) and the World Bank Group in 2008-2009. The survey was taken in 12 countries: Belarus, Bulgaria, Germany, India, Kazakhstan, Lithuania, Poland, Romania, Russia, Serbia, Ukraine, and Uzbekistan. The survey questionnaires were aimed to present information about management practices. The sample for this study is composed of 769 companies from six countries: Germany, India, Lithuania, Poland, Romania, and Russia. Further, gender diversity is explicated as women's ratio, particularly as the proportion of women in the top management team, and openness as interaction with outside, specifically as outsourcing strategy. Firm innovation is defined as the introduction of a new product or service. The results show that gender diversity is positively related to innovation performance, openness is also positively associated with the level of firm innovation.

This paper makes several contributions to the diversity and governance literature. First, the impact of diversity was examined at the top of the managerial ranks. Most studies focused their research on the effects of the composition in the boardroom. Second, the empirical evidence from six countries (Germany, India, Lithuania, Poland, Romania, & Russia) was provided, furthermore this study can be regarded as cross-cultural analysis. Many of the previous research works drew their attention primarily to the US and some Western developed economies. Third, the understanding of the nature of the relationships among gender diversity, openness, and innovation was extended for the strategic management research area. Finally, the paper endorses more female participation on top management on account of suggesting that firms with a substantial number of women in top management teams and higher degree of openness (outsourcing strategy) advance firm's opportunities for innovation.

2. Literature and Hypotheses

2.1. Literature review

Prior research on diversity provided evidence on a variety of aspects and in different contextual frameworks. Table 1 presents review of preceding studies. Diversity expands in the organisations and it impacts directly and indirectly on performance. Some studies have focused on the 'value in diversity' concept. In the support of this perspective, such beneficial outcomes have been suggested: new combinations of knowledge (Cohen & Levinthal, 1990; Miller et al., 2009), more effective decision-making (Carter, Simkins, & Simpson, 2003; Iles & Auluck, 1993; Priem, Harrison, & Muir, 1995), creativity (Campbell et al., 2008; Erhardt et al., 2003), wide range of search (Nelson & Winter, 1982; Watson et al., 1993), better international relations (Jelinek & Adler, 1988).

Table 1: Previous Studies on Diversity Dimensions

Journal (year)	Author(s)	Diversity Measure	Sample	Performance measure	Results
Academy of Management Journal (2009)	Aparna Joshi, Hyuntak Roh	Team diversity: race, gender, age, tenure, education, function; Blau's, Teachman's, Allison's index	8,757 teams from 39 studies	Team performance: financial and operational (e.g., sales, productivity)	Few direct effects, but significant moderating effects
Administrative Science Quarterly (1996)	Donald C. Hambrick, Theresa Seung Cho, Ming-Jer Chen	TMT heterogeneity: function, education, company tenure; Herfindal-Hirschman index	TMTs of 32 US airlines	Firm performance: growth in market share and in profits	Significant support for main effect relationships
Administrative Science Quarterly (1996)	Lisa Hope Pelled, Kathleen M. Eisenhardt, Katherine R. Xin	Work group diversity: age, tenure - Allison's index, functional background, gender, race - Teachman's, Blau's index	45 teams - electronics, 3 multinational companies	Manager-rated group performance: efficiency of team operations	No direct relationships, but significant moderating effects
Corporate Governance (2003)	Niclas L. Erhardt, James D. Werbel, Charles B. Shrader	Diversity representation: percentage of women and minorities on board of directors	112 public companies (Fortune)	Organisational performance: ROA and ROI	Significant support for main effects
Corporate Governance (2010)	David A. Carter, Frank D'Souza, Betty J. Simkins, W.Gary Simpson	Diversity: gender and ethnic - number of female/minority (Black and Hispanic) directors on the board and board committees	S&P 500 firms	Financial performance: Tobin's Q and ROA	No evidence of a negative impact
Corporate Governance (2013)	Salim Darmadi	Gender diversity: proportion, dummy, Blau index	354 firms on IDX	Firm performance: ROA, Tobin's Q	No significant main effects
Financial Review (2003)	David A. Carter, Betty J. Simkins, W.Gary Simpson	Board diversity: percentage of women, minorities (African American, Asians, Hispanics)	Fortune 1000 firms	Firm value: Tobin's Q	Significant main effects
Journal of Applied Psychology (2009)	Eric Kearney, Diether Gebert	Team diversity: age, nationality, and educational background; Blau's index	62 teams - pharmaceutical, Germany	Team performance rated by team leaders: efficiency, productivity	No direct relationships, but significant moderating effects

Journal of Business Ethics (2008)	Kevin Campbell, Antonio Minguez-Vera	Gender diversity: dummy, percentage of women on the board; Blau and Shannon indices	68 Spanish non-financial firms	Firm value: Tobin's Q	Support for main effects
Journal of Business Ethics (2010)	Stephen Bear, Noushi Rahman, Corinne Post	Board diversity: professional background, experience, gender; Blau's index	Fortune 2009 firms (689 companies)	Firm performance: change in firm stock price, return on assets	Significant main effects and support for mediation effects
Journal of Business Ethics (2011)	Mariateresa Torchia, Andrea Calabro, Morten Huse	Gender diversity: number of women directors (four groups)	Norwegian companies (317 firms)	Firm innovation rated by board members	Support for main effects, significant mediating effects
Journal of Financial Economics (2009)	Renee B. Adams, Daniel Ferreira	Gender diversity: dummy, fraction	US 1,939 firms	Firm performance: Tobin's Q, ROA	Mixed support for main effects
Journal of International Social Research (2009)	Maran Marimuthu, Indraah Kolandaisamy	TMT diversity: gender and ethnic - percentage of female/minority (non-Malay) top managers	Malaysian non-financial firms	Financial performance: ROA, ROE	No clear pattern
Journal of Managerial Issues (1997)	Charles B. Shrader, Virginia B. Blackburn, Paul Iles	Gender diversity: number and percentage of women in management, top management team and board of directors	200 US firms (Wall Street Journal)	Financial performance: ROS, ROA, ROI, ROE	Mixed support for main effect relationships
Journal of Management Studies (2009)	Toyah Miller, Maria del Carmen Triana	Board diversity: race and gender - Blau's index, proportion	Fortune 500 firms	Firm performance: ROI and ROS	Significant main effects and partial support for mediating effects
Journal of Small Business Management (2017)	Charbel Salloum, George Jabbour, Catherine Mercier-Suissa	Diversity: gender and ethnic - percentage of female/minority (Western) board members	371 SMEs, Middle East	Firm performance: Tobin's Q	No direct relationships
Research Policy (2011)	Christian R. Ostergaard, Bram Timmermans, Kari Kristinsson	Employee diversity: gender, age, ethnicity, education - Shannon-Weaver index	Danish firms (1648 companies)	Firm innovation	Partial support for main effect relationships

Strategic Management Journal (1989)	Alan I. Murray	Group diversity: age, tenure, education, occupation - Blau, Shannon index	TMTs of 84 Fortune 500 companies	Firm performance: ratio of earnings to sales, ratios of stock price to earnings	Fixed effects were restricted, but partial support for moderating effects
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Smith, Smith, and Verner (2006) argues that greater diversity increases a company's competitive advantage. Moreover, board composition gives a better understanding of the complexities of the environment and firm strategic solutions. Quintana-Garca and Benavides-Velasco (2008), for example, proposes that the breadth of viewpoints, educational backgrounds and experiences promote searching capacity of the company through better problem solving and creation of new ideas. The diversification of views that arises affect decision makers to assess more alternatives and more mindfully consider the consequences of these choices (Ostergaard et al., 2011).

Rosener (1995) puts forth the argument that in times of uncertainty and significant changes gender diverse groups can actually improve a firm's capabilities to be resilient and adaptive. Furthermore, companies hiring a large amount of women in management accomplish better financially (Blackburn et al., 1994; Throup, 1994). Recent law enactments and diversity endeavors across the world have appealed more awareness to the value of female participation in the boardroom. Through interaction and learning, team composition in the skills, information, and expertise enhances the opportunities for novel combinations of knowledge within a firm too (van der Vegt & Janssen, 2003; Woodman et al., 1993). Diversity strengthens the company's aptness to utilize knowledge from outside, augmenting absorptive capacity (Cohen & Levinthal, 1990). In a global context ethno-cultural diversity is a crucial ability for a company to comprehend its culturally diverse customer base (Richard, 2000). Additionally, diversity advances to evolve propitious relationships and collaborative alliances with international partners (Carter et al., 2003).

There are also arguments that stereotyping and tokenism are taking place so far due to low representation (Bilimoria, 2000; Kanter, 1977a, b). Because of clichés, a minority individual is prejudiced and treated unfairly. Negative perception is followed sometimes with blatant mockery (Maass & Clark, 1984; Nemeth & Wachtler, 1983). As a result, categorization can provoke in the perception of impediments to making an effort to impact on decisions in the group (Kanter, 1977a, b). Further, Kanter suggests that being labelled as a token frequently forms disturbance, isolation, self-doubt. For tokens it is difficult to speak up and to be heard in groups (Nemeth, 1986).

This study tests the relationships among gender diversity, openness, and innovation, at firm level across countries from the Management, Organisation, and Innovation (MOI) Survey.

2.2. Theoretical Perspectives and Hypotheses

2.2.1. Gender Diversity and Firm Innovation

Firms with larger female participation at top management integrate varied points of view in the decision making process (Bear et al., 2010; Shrader et al., 1997). Gender diversity develops new alternative options and generates innovative ideas by expanding search scope (Carter et al., 2003; Torchia et al., 2011). Hillman, Cannella, and Harris (2002) suggest that women on top management bring diversified perspectives. Female top managers are open to innovative approaches to do business (Bilimoria & Wheeler, 2000), in view of the fact that they show a tendency to have various educational and professional backgrounds (Bantel & Jackson, 1989). In addition, the presence of women on top management develops a pleasant atmosphere and more well-disposed work environments (Bernardi et al., 2006; Johnson & Greening, 1999), as well as distinct values (Bilimoria & Huse, 1997).

There are also some arguments that the solidarity and quality of group decisions advance in more diversified groups, particularly on complicated tasks (Amason, 1996; Hoffman & Maier, 1961) and under unstable circumstances and ambiguity (Hambrick & Mason, 1984). Wiersema and Bantel (1992) argue that firms with larger female representation on top management are better able to promote strategic change. Women at high-ranking leadership positions can exert influence on affecting strategy direction since their experience is often closely arranged with company needs (Fondas, 2000). Then diversity of experience can increase team innovation (Joshi & Roh, 2009). Furthermore, Westphal and Milton (2000) claim that women in the top management team have capability to contribute to organizational decision making by giving unique prospects on strategic issues and by producing divergent ways of reflection among the

majority group. Female participation at high levels of management positions can foster other members to take into consideration a greater variation of possible solutions (Nemeth, 1986). Additionally, the behavioural theory of the firm set forth that the width of the search and problem-solving methods can impact innovation in organisations (Cyert & March, 1963).

Several studies find that firm innovation improves through extending search activities, creating more alternatives, and elaborating multifarious ideas (Erhardt et al., 2003; Watson et al., 1993). A wide range of search progresses in companies with more various teams (Dosi, 1988; Nelson & Winter, 1982). Eagly et al. (2003) posits that a substantial number of women on top management may encourage more participative communication. Gender diversity enables a more accurate evaluation of possible course of action and selection of opportunities (Mintzberg et al., 1976).

Further, Hitt and Tyler (1991) suggest that the effect of background diversification can drive top leadership teams to change or extend the specification for assessing strategic alternatives. Also female representation at high levels of management positions beneficially facilitates the level of firm innovation by virtue of evolving fresh ideas and stimulating creativity (Amabile, 1988; Kanter, 1983). Moreover, Ibarra (1993) puts forward that the social networks of women are likely to be more varied. Firms with greater gender diverse top management teams may enhance their competitive advantage on account of making the company's image better and in consequence this results favorably on behaviour of customers too (Campbell et al., 2008). According to earlier research works supporting signalling theory, female top managers have an attitude of appreciation to various cultures in new markets (Mattis, 2000; Miller & Triana, 2009; van der Walt & Ingley, 2003). In addition, women at the top of managerial ranks are able to improve international relations and develop worldwide collaboration (Rosener, 1995; Shrader, 1997). So promising outputs of innovation are produced by giving rise to a variety of alternatives, accumulating new ideas and creativity, and diversifying search capacity due to female participation in the top management teams. Thus, the following is proposed:

Hypothesis 1: Gender diversity is positively related to the firm's prospect to innovate.

2.2.2. Openness and Firm Innovation

Diversity in a firm's knowledge framework enhances its absorptive capacity and potentiates a firm to create new combinations (Cohen & Levinthal, 1990; Wenger, 2000). Companies with a great variety of connections tend to be more open and increase their opportunities of positive outcomes on the firm's innovative competences (Granovetter, 1973; Robertson et al., 1996).

Zahra and George (2002) suggest that the firm's propensity to make use of knowledge from outer sources is enlarged by diversification in the company's knowledge base. Intelligence multiformity in the firm influences absorptive capacity of the firm. Additionally, betterment of the basis for learning due to information diversity allows companies to make novel combinations (Cohen & Levinthal, 1990). The company's likelihood to innovate is impacted by the breadth of its technological base (Breschi et al., 2003; Garcia-Vega, 2006). Furthermore, Lundvall (1992) states that firms with variety in the skills, knowledge and practice among their workforce multiply probabilities for new composition of knowledge within a firm through cooperation and training.

Some studies show that the magnitude of firm's openness is procured by network diversity (Bear et al., 2010; Miller et al., 2009). Firms with manifold connections take part in interactions with outside (Burt, 1992). Moreover, Beckman and Haunschild (2002) find that networks may give recommendations and expertise, also diverse relations promote partnership and collaboration. Richard et al. (2007) suggest that diversity can improve a company's 'market competence'. Further, in accordance with resource-based theory researchers claim that utilizing and developing unique resources help firms to compete better in dynamic industry settings (Barney, 1997; Hamel & Prahalad, 1994). Then firms with diversification of communications are prone to raise the degree of openness and boost their possibilities for innovation (Burt, 1997). Therefore, the following is proposed:

Hypothesis 2: Openness (outsourcing strategy) is positively associated with the firm's prospect to innovate.

3. Methodology

3.1. Data and Sample

Data was gained from the Management, Organisation, and Innovation (MOI) Survey, conducted by the European Bank for Reconstruction and Development (EBRD) and the World Bank Group in 2008-2009, in partnership with

BEEPS (Business Environment and Enterprise Performance Survey). It is based on the work of Nick Bloom and John Van Reenen. Almost 1,800 manufacturing enterprises with between 50 and 5,000 employees in 12 countries: Belarus, Bulgaria, Kazakhstan, Lithuania, Poland, Romania, Russia, Serbia, Ukraine, Uzbekistan, Germany and India, were taken in the survey. The survey questions were aimed to present information about management practices and innovation at the establishment level across countries.

To minimize measurement error in the MOI survey an aptly constructed survey instrument and a uniform sampling methodology were applied. The survey questionnaires were inquired in all industries in every country of the survey and also the sample was chosen using random sampling that comprised all regions of these countries, in order to provide internationally comparable data. Furthermore, the scope of samples is large enough to carry out statistically robust analyses for assessment of management practices across the economies.

The MOI survey was intended for factory, production or operations managers, who are close to day-to-day operations of the firm, but are at the same time senior enough to make a synopsis of management practices. Interviews were led face-to-face in the native language of the manager (MOI Survey, 2008).

The sample for this study is composed of 769 companies from six countries: Germany, India, Lithuania, Poland, Romania, and Russia. Data on the cultural dimensions was taken from the Hofstede model of national culture (Hofstede, 2001). 769 firms were from the following industries: food, textiles, garments, chemicals, plastic and rubber, non metallic mineral products, basic metals, fabricated metal products, machinery and equipment, electronics, and others. Among twelve countries of the survey these six countries were selected as the final data set for the analysis.

3.2. Measurements

3.2.1. Gender Diversity

In this study as a measure for gender diversity women's ratio was used to examine the effect of female representation on top management on firm's potential to innovate. Women's ratio is the proportion of women in the top management team calculated as the number of female permanent, full-time, top managers divided by the total number of permanent, full-time, top managers. Figure 1 shows the percentage of female top managers across countries of the survey that were taken for analysis.

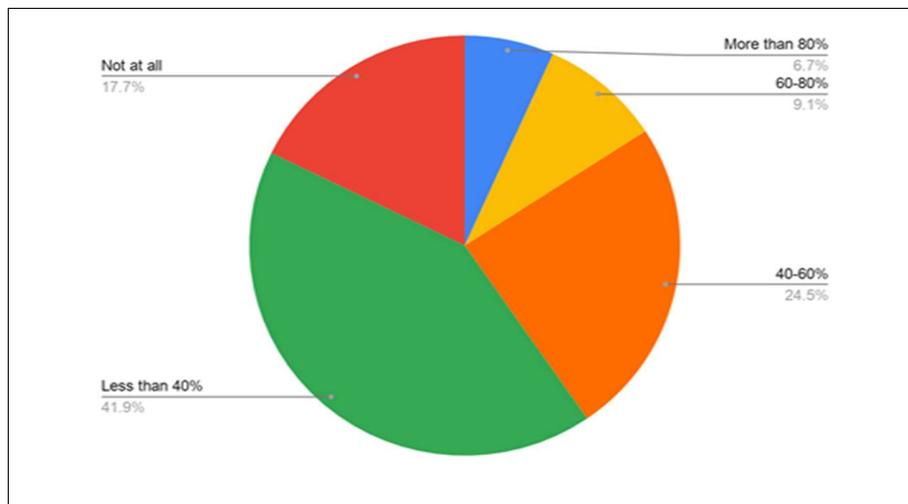


Figure 1: The Presence of Women on Top Management

17.7% of the sample firms do not have women on top management. For example, Torchia et al. (2011) report a value of 26% and Carter et al. (2003) a value of 24.8%, whereas Miller et al. (2009) report a value of 12%. 6.7% firms have higher than 80% of women in the top management team. 9.1% firms have 60-80% of female top managers. 24.5%

firms have 40-60% of female participation at high levels of management positions. 41.9% of the sample firms have below 40% of women at high-ranking leadership positions.

3.2.2. Openness

For cross-country firm level analysis outsourcing strategy was used as a proxy for an extent of the company's openness. Diverse teams are likely to be more open and partake in interactions with outside (Daft & Lengel, 1984; O'Reilly, 1983). Outsourcing practice is defined as activities that are run on the behalf of the enterprise by other companies. The establishments that are part of the same national/ international company as the enterprise being surveyed do not need to be included (MOI Survey, 2008). The dummy variable, *Outsrc*, was used, that is equal to 1 when production is outsourced, and 0 if not.

3.2.3. Firm Innovation

In this paper, firm innovation is explicated as the introduction of a new product or service. It is relevant with prior research as well (Ostergaard et al., 2011; Zahra et al., 2000). Innovation requires changes in the process of production or how the service is provided, minor improvements on a product are not included (MOI Survey, 2008). The dummy variable, *NPS*, was used, that takes a value of 1 when there is introduction of a new product or service, and 0 otherwise.

3.2.4. Control variables

Several control variables were included as preliminary research has linked with innovation. Country's gross domestic product (GDP) and per capita gross domestic product (GDP1) were utilized in this paper. A country's GDP estimates a country's economic productivity (The World Bank data catalog, 2009). Per capita GDP is calculated by dividing the GDP of a country by its population (International Monetary Fund database, 2009). To decrease the influence of a deflected distribution, natural logarithm of these measures were utilized. These global measures were taken for analysis of national wealth (OECD, 2009). Therefore, comparable insight across countries can be contributed.

Table 2: Variable Definition

Variables	Description
Gender diversity	Ratio of women in top management team
Openness (outsourcing practice)	Activities that are run on the behalf of the enterprise by other companies
Country's GDP	Natural logarithm of country's GDP
Per capita GDP	Natural logarithm of per capita GDP
Individualism	Individualism versus collectivism dimension (Hofstede's model of national culture)
Masculinity	Masculinity versus femininity dimension (Hofstede's model of national culture)
Patents abroad	Patents registered abroad (Binary)
Patents local	Patents registered locally (Binary)
Firm size (TMT size)	The number of top managers
Innovation performance	Introduction of new product or service

The following two dimensions from Hofstede's model of national culture were used in this study: individualism versus collectivism and masculinity versus femininity. The framework is practiced to understand differences in culture across countries (Hofstede, 1993). It indicates the ways of handling aforementioned areas in societies.

The individualism versus collectivism dimension (*Idv*) regards the extent of combining societies into groups and their taken commitment and dependency on groups (Hofstede et al., 2005). Individualistic societies represent a favor for loose social ties that associate with accomplishing personal goals and taking care of their immediate families.

Collectivism signifies that a society has tightly-knit relationships in which their relatives and in-group members are bound with undoubted loyalty and bolster up each other when a conflict occurs with another in-group (Hofstede, 1983).

The masculinity versus femininity dimension (Mas) is also cited as “tough versus tender” cultures. Masculinity can be described as a proclivity for attainment, intrepidity, assertiveness, and material rewards for success. Feminine societies choose collaboration, decency, compassion for the weak and quality of life (Hofstede, 1980).

Furthermore, patents registered abroad and patents registered in the country where the establishment is located were utilized. According to the questionnaire, a patent protects new inventions and covers how things work, what they do, how they do it, what they are made of and how they are made (MOI Survey, 2008). These binary variables were used: PatAb is equal to 1 if patents registered abroad, and 0 if not; PatLc is equal to 1 if patents registered locally (nationally), and 0 if not.

Additionally, the top management team (TMT) size was used as a proxy for firm size. The top management team size was measured as the number of top managers. It is also controlled for the reason that prior studies have shown that firm size has an effect on firm’s capacity for innovation. The following section of this research presents findings of investigation of the relationships among gender diversity, openness, and innovation performance.

4. Results

4.1. Descriptive statistics

The means, standard deviations, and correlations are presented in Table 3. Innovation (introduction of new product or service, NPS) was initiated in about 68% of the firms in the sample during 2008-2009 period. The average percentage of women in the top management team, FTM, was 25.3%. The mean value of openness (outsourcing practice) was 47.7%.

Table 3: Means, Standard Deviations, and Correlations

Variables	Mean	S.D	1	2	3	4	5	6	7	8	9	10
1. NPS	.683	.017	-									
2. GDP	14.015	.043	0.022	-								
3. GDP1	9.167	.051	0.353***	0.225***	-							
4. Idv	51.226	.447	0.168***	0.259***	0.475***	-						
5. Mas	50.147	.536	-0.012	0.659***	0.087**	0.587***	-					
6. PatAb	.346	.017	0.237	-0.496***	0.302***	0.170***	-0.107	-				
7. PatLc	.415	.018	0.205	-0.062	0.248***	0.215***	-0.041	0.398***	-			
8. Firm size	15.484	.785	0.138	0.118***	0.188***	-0.032	-0.096	0.027	0.207***	-		
9. Openness	.477	.018	0.198	-0.375***	0.276***	0.079***	-0.149	0.460***	0.09**	0.078*	-	
10. FTM (%)	.253	.009	0.141	-0.233***	0.161***	-0.333***	-0.454***	0.076	0.042	0.186**	0.078	-

Note: *p < 0.1; **p < 0.05; ***p < 0.01

Additionally, Table 3 indicated some significant correlations between variables. Innovation was positively correlated with per capita GDP (p < 0.01). Gender diversity was significantly correlated with firm size (top management team size) (p < 0.05). There was a high correlation between GDP and masculinity. GDP per capita was also positively correlated with individualism, patents, and openness.

4.2 Empirical results

Regression results for the hypotheses 1 and 2 are presented in Table 4. Hypothesis 1 suggested that gender diversity was positively related to firm’s innovation. The coefficient for female top managers was positive and significant

($p < 0.05$). Therefore, Hypothesis 1 was supported. Hypothesis 2 predicted that openness (outsourcing practice) was positively associated with innovation of the firm. The coefficient for openness (outsourcing) was positive and significant ($p < 0.01$), supporting Hypothesis 2. Accordingly, the more gender diverse (balanced) top management team and the higher openness (outsourcing policy) will bring firm's innovation with greater possibility.

In models 1 and 2 of Table 4, findings show that GDP of the country had a significant and positive impact on innovation. However, the impact of GDP per capita was significant in model 1 concerning control variables and not significant in model 2 when the effect of independent variables was added. In addition, models 1 and 2 indicated that individualism had a positive and significant influence on innovation. Interestingly, the estimates for masculinity were negative and significant in both models 1 and 2. Moreover, patents registered abroad had a strong positive and significant relation to innovation in models 1 and 2 of Table 4. The coefficient for patents registered nationally was positive but not statistically significant for innovation in both models 1 and 2. Though, the effect of firm size (TMT size) was significant in model 1 and not significant in model 2.

Table 4: Regression Results

	Variables	Model 1		Model 2	
C.V	GDP	0.4681	**	0.6327	***
	GDP1	0.2390	**	0.0992	
	Idv	0.0213	*	0.0316	***
	Mas	-0.0259	**	-0.0285	**
	PatAb	1.4543	***	1.4102	***
	PatLc	0.2806		0.3131	
	Firm size (TMT size)	0.0099	*	0.0070	
I.V	Openness (Outsrc)			0.5656	***
	FTM (%)			1.0040	**
Number of obs				769	
LR chi2 (9)				142.18	
Pseudo R2				0.148	

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

5. Conclusion

5.1. Discussion

This study examines the relationships among gender diversity, openness and innovation performance at establishment level across countries from the Management, Organisation, and Innovation (MOI) Survey. The results show that gender diversity is positively related to firm innovation, moreover openness is positively associated with the level of firm innovation.

The results support that women on top management and openness (outsourcing policy) are crucial determinants for innovation of the firm, particularly new product and service. This is rational along with the 'value in diversity' concept. Firms with larger female participation at high levels of management positions can contribute to decision-making processes through providing greater variation of viewpoints on strategic issues and creating divergent ways of thinking. This is consistent with previous studies showing that consensus and quality of decisions are likely to be improved in more diverse groups, especially on complex goals (Hoffman, 1959; Iles & Auluck, 1993; Nemeth & Kwan, 1985). Further, a substantial number of women in the top management teams increases the level of firm innovation by expanding search efficiency, developing more alternatives, and generating varied creative ideas. In this sense, prior research supports that firm innovation advances by means of producing a vast variety of alternative options,

elaborating diversified ideas, and widening search activities in virtue of female representation on top management (Amabile, 1988; Erhardt et al., 2003; Hitt & Tyler, 1991). Additionally, women in the top leadership teams beneficially facilitate global collaboration and promote auspicious relations with international partners. This is relevant with preceding studies showing that female top managers make progress at developing international relationships and improving worldwide cooperation (Carter et al., 2003; Jelinek & Adler, 1988).

Furthermore, a company's capability to use knowledge from outside and creation of new combinations positively influence a firm's potentiality to innovate. This is consistent with earlier research works supporting that diversity in a firm's knowledge basis enhances its absorptive capacity and raises opportunities to make novel combinations (Cohen & Levinthal, 1990; Lundvall, 1992; van der Veegt & Janssen, 2003). In addition, firms with diversification of connections have a tendency to enlarge the extent of their openness, stimulate partnership and alliances, and multiply probabilities for innovation of the firm. This is coherent with previous studies showing that network diversity gives companies proclivity to be more open, propels cooperation, and advances firm's innovation (Bear et al., 2010; Beckman & Haunschild, 2002; Burt, 1997).

5.2. Limitation

There are some limitations in this paper that entail to be addressed. First, only six countries were considered because of the constraints of the sample. For the reason that data was confined, it would be favorable to carry out more broad-ranging research for further detailed outcomes. Second, industry sectors were not investigated. Hence, it would be compelling to detect female representation on top management and openness in different industries. Third, innovation measurement is needed to be more accurate. However, other proxies can be selected to observe various effects.

5.3. Contributions

This study contributes to the diversity and governance literature. First, the impact of diversity was examined at high-ranking leadership positions. Second, a cross-cultural analysis was conducted based on the empirical evidence from six countries: Germany, India, Lithuania, Poland, Romania, and Russia. Third, the understanding of the nature of the relationship among gender diversity, openness, and innovation was extended for the strategic management research area. Finally, the paper encourages more female participation on top management on the grounds of recommending that firms with greater gender diverse top management teams and higher openness (outsourcing strategy) enhance firm's possibilities to innovate.

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