# Strategic CSR for innovation in SMEs: Does diversity matter?[1]

**Abstract**

Both corporate social responsibility and diversity influence firms' innovation, yet their relationship and links to innovation remain uncertain, especially among small to medium-sized enterprises. Relying on strategic and institutional CSR perspectives and a value-in-diversity approach, this study examines the mediating roles of gender and nationality diversity on the CSR–innovation link at the organizational level. With a sample of 1,348 SMEs from Luxembourg, the results show that strategic CSR can promote both types of diversity, but only nationality diversity triggers technological innovation. Nationality diversity emerges as a partial mediator of the relationship between CSR and SMEs' technological innovation. Thus, strategic CSR, through the genuine pursuit of such diversity, can help SMEs attain positive returns on their product or process innovation. These results have important theoretical and managerial implications.

**Keywords**: diversity, gender, innovation, nationality, responsive/strategic CSR.

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This research seeks to reconcile literature on corporate social responsibility (CSR), diversity, and innovation performance. Prior research notes a direct link between CSR and innovation (e.g., McWilliams and Siegel, 2000; Mishra, 2017; Wagner, 2010), but a separate tradition designates diversity as the primary source of value creation, due to its influence on creativity and innovation (e.g., Bantel and Jackson, 1989; Herring, 2009; Joshi and Roh, 2009; Ruiz-Jiménez et al., 2016). Yet we know little about the precise mechanisms that lead CSR to produce innovation and how diversity might influence the relationship. Even though this topic is critical for both firms and their employees as key stakeholders, extant literature offers insufficient insights into CSR and diversity issues (Sharma et al., 2019). Moreover, results regarding the relationship of various types of diversity with innovation are still contradictory, especially at an aggregate workforce level (Mohammadi et al., 2017). To address this gap, we seek to integrate both CSR and diversity literature to derive a framework that can predict the conditions in which CSR strategies might promote firms' diversity and technological innovation. For this research, we account for both product and process innovations, rather than analyzing innovation performance in relation to new products only (Østergaard et al., 2011).

From a theoretical perspective, both gender and nationality diversity present significant challenges. Research into gender diversity usually concentrates on top management teams or boards and on their impacts, generally indicating a positive impact on innovation (e.g. Horbach and Jacob, 2018) or no impact (Faems and Subramanian, 2013). Gender diversity at the firm level has been far less studied, with more mixed effects on innovation. This relative lack of research also applies to nationality diversity. McGuirk and Jordan (2012), in a study of mostly small Irish firms, find positive effects on product innovation and negative effects on process innovation. Faems and Subramanian (2013) also consider nationality diversity but identify no impact on innovation (measured as patents). We know of no other study that considers nationality diversity in relation to technological innovation.

There also is a strong empirical rationale for studying both forms of diversity. The European Commission (2017b) has issued recommendations for increasing diversity. Diversity requirements may be particularly relevant in a country like Luxembourg, the empirical context for our study, with its constrained labor market. In this small country, women do not participate in the labor market to the same degree as men, accounting for approximately 44.2% (vs. 55.8% for men), which also is lower than the European average (46.2% in the European Union [EU] with 15 countries, 46.0% in the EU with 28 countries). Furthermore, the theoretical void in relation to nationality diversity raises questions about small countries such as Luxembourg,

which employs a high proportion of foreign employees of different nationalities due to the small national labor market. In this nation, foreign workers represent a large majority of total employment (71.3% at the end of 2013, including both foreign workers and foreign non-residents),[2] far greater than in most other European countries (8.3% in the European Union with 15 countries or 6.9% in the EU with 28 countries[3]).

Such questions are particularly important for small to medium-sized enterprises (SMEs). Extant research fails to acknowledge how critical CSR and diversity are to SMEs' business strategies and long-term planning, often focusing solely on large firms (European Commission, 2017a). Although CSR literature has begun to explore CSR in relation to small firms (Ferramosca Verona, 2019), suggesting how CSR might contribute to their diversity (Grosser, 2009; Grosser and Moon, 2005), help SMEs retain their qualified employees, or improve their innovative capacity (Surroca et al., 2010), we know of no studies that consider how diversity might alleviate the inherent challenges that SMEs face, including resource constraints and difficulties recruiting and retaining high quality staff (Freel, 1999, 2000; Ruiz-Jiménez et al., 2016). Recently, such difficulties have been highlighted by Terruel and Segarra-Blasco (2017) who identify firm size as a moderator of the relationship between gender diversity and innovation. They show that small firms struggle to capture the advantages of such diversity for their innovation, relative to larger firms. To benefit from CSR strategies, especially in terms of innovation, SMEs must be proactive (Chang, 2015; Jenkins, 2009; Martinez-Conesa et al., 2017; Perrini et al., 2007; Torugsa et al., 2012). Because SMEs face constraints, in terms of their operational agenda and human and financial resources (Ruiz-Jimenez and Fuentes, 2016), they tend to rely on management capabilities to ensure their performance (Lubatkin et al., 2006). CSR and diversity offer alternative options to overcome their inherent constraints. In particular, through strategic CSR, SMEs might translate human resource constraints into business benefits (Bocquet et al., 2013), in that it can help them recruit attractive employees by broadening the talent pool available to them, due to greater gender and nationality diversity (Gudmundson and Hartenian, 2000). Moreover, by increasing the diversity of their workforce, SMEs may enhance their adaptive capacity to compete in international markets (Loane et al., 2007) and the breadth of perspectives available to

[2] https://statistiques.public.lu/stat/TableViewer/tableView.aspx?ReportId=12916&IF_Language=eng&MainTheme=2&FldrName=3&RFPath=92 (accessed 20 March 2019)

[3] http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_egan&lang=en (accessed 18 March 2019).

inform their decision making. Diversity, if properly aligned with strategic CSR, thus may improve decision quality and encourage innovation (Cox and Blake, 1991).

With these motivations in mind, we consider whether diversity in gender and nationality acts as a mediator between SMEs' CSR strategies and technological innovation. In our proposed theoretical framework, we combine a strategic business case for CSR (McWilliams and Siegel, 2001; McWilliams et al., 2006; Porter and Kramer, 2006) with an institutional perspective on CSR to explain the observable divergences in SMEs' CSR and diversity strategies (Pedersen and Gwozdz, 2014; Sharma et al., 2019). We also integrate a value-in-diversity approach to predict whether and how the value of human capital might be enhanced through diversity (Singh and Point, 2004).

To test this framework empirically, we use SME data from Luxembourg, a European country with an intermediate position in terms of CSR: 50%–61% of its SMEs engage in CSR activities (European Commission, 2017a). Luxembourg also offers interesting diversity issues: its companies may suffer from what Cox and Blake (1991, p. 45) call the inevitability of diversity, in the sense that "competitiveness is a priori affected by the need (because of national and cross-national workforce demographic trends) to hire more women, minorities, and foreign nationals." The question of whether and how some SMEs leverage diversity as a source of value creation (value-in-diversity) thus is highly pertinent in this setting. We also have access to rich data from a unique Luxemburgish survey about sustainability issues, as well as official diversity data.

With a sample of 1,348 Luxemburgish SMEs, we adapt Baron and Kenny's (1986) method for mediation tests by implementing a two-step econometric procedure with instrumental variables to correct for endogeneity, drawing on work by Surroca et al. (2010). First, we estimate the effect of strategic CSR on diversity in gender and nationality among SMEs. Second, we assess the effect of the predicted values of diversity (gender and nationality) on SMEs' technological innovation (product or process) and assess whether it has a mediating role in the CSR–innovation relationship.

We thus reconcile prior CSR and diversity literature by providing a more fine-grained depiction of CSR–diversity–innovation relationships. Our results also enrich strategic and institutional CSR perspectives by revealing the differentiated effects of CSR strategies on diversity, as well as of nationality and gender diversity on technological innovation. The benefits of a diverse workforce have long been cited (Cox and Blake, 1991; Díaz-García et al., 2014; Harrison and Klein, 2007; Kristinsson et al., 2016), but CSR as an antecedent of such diversity has not been sufficiently analyzed. By illustrating the mediating role of diversity when CSR is

strategic, we also extend the value-in-diversity hypothesis (Cox and Blake, 1991) to the case of small firms.

## Theoretical framework and hypotheses

Our framework draws on three main theories: a Porterian model of strategic CSR, the institutional CSR perspective, and the value-in-diversity approach. First, the Porterian model (Porter and Kramer, 2006, 2011) predicts that CSR is a crucial source of innovation and value creation (Burke and Logsdon, 1996). Strategic CSR purposefully aims to create resources and capabilities that can lead to technological innovation, and in turn to superior economic performance. From this model, we draw predictions about how diversity in gender and nationality, driven by (strategic) CSR, might influence firm innovation. We also advance this literature stream by specifying the mediating impact of diversity on firm innovation. Second, institutional theory (Oliver, 1991; Pedersen and Gwozdz, 2014) provides an explanation for diverse firm responses with regard to CSR. Firms facing institutional pressures for CSR from influential stakeholders adopt strategic responses that enable them to translate these pressures into business benefits (Pedersen and Gwozdz, 2014). By adopting CSR, the firm incorporates a community logic and improves its overall performance. Third, to present diversity as a potential antecedent of innovation, we build on the value-in-diversity hypothesis (Cox and Blake, 1991; Singh and Point, 2004), which emphasizes the advantages of diversity for innovation and problem solving. It stems from information and decision-making theory, according to which diversity favors idea and knowledge exchanges and thus enhances innovation. Organizational demography theory (Pfeffer, 1985) and the similarity attraction approach (Byrne, 1971) offer a parallel explanation, in that people tend to interact with others who are similar to themselves, but members of diverse groups have access to more external information. Variance in group composition then may have direct, positive impacts on innovation performance, due to increased skills, information, abilities, and knowledge (Williams and O'Reilly, 1998). However, they also suggest that diversity creates problems in terms of communication, cooperation, and cohesion between firm members of different ages, which ultimately may negatively affect innovation and overall performance.

In reconciling these three theoretical frameworks, we argue that firms engaged in strategic CSR benefit from different opportunities and thus may exploit the value of workforce diversity. That is, a firm with strategic CSR likely is conscious of value-in-diversity. Because it engages in

strategic CSR, it voluntarily pursues diversity, which has the potential to enhance its performance, especially with regard to technological innovation.

*Strategic CSR and diversity*

In line with our theoretical framework, we consider that the way firms implement CSR has an influence on its benefits. We delineate how different types of CSR may produce distinct outcomes. We adopt Burke and Logsdon's (1996) model of strategic CSR, in which engaging in social, societal, or environmental actions provides firms with opportunities for value creation and innovation. Their study explicitly introduces a strategic view on CSR with five dimensions (centrality, proactivity, voluntarism, visibility, and specificity) which can anticipate the extent to which CSR leads to innovation. It also allows to characterizes firms as strategic or responsive in their CSR. According to Porter and Kramer (2006, p. 85), "responsive CSR comprises two elements: acting as a good corporate citizen, attuned to the evolving social concerns of stakeholders, and mitigating existing or anticipated adverse effects from business activities," whereas "strategic CSR moves beyond good corporate citizenship and mitigating harmful value chain impacts to mount a small number of initiatives whose social and business benefits are large and distinctive" (p. 88). Therefore, firms might do nothing, react to legislation, or be proactive in pursuing CSR. Strategic CSR requires the firm to align its overall strategy with its CSR, which induces a virtuous circle that supports various activities, including innovation. Thus, adopting strategic or responsive CSR produces varied benefits (e.g., Bocquet et al., 2013; Chang, 2015; Martinez-Conesa et al., 2017). We analyze the relationships of strategic/responsive CSR with diversity, with the prediction that strategic CSR leads to higher diversity and consequently to technological innovation[4].

Diversity refers to differences among the members of a unit on some specified attributes (Harrison and Klein, 2007; Williams and O'Reilly, 1998) such as social categories, knowledge and skills, values and beliefs, personalities, organizational or community status, or social and network ties (Mannix and Neale, 2005). A popular classification divides diversity types into two groups, surface-level and deep-level, according to the visibility of the focal attribute (Harrison et al., 1998; Milliken and Martins, 1996; Richard, 2000; Shore et al., 2009; Williams and O'Reilly, 1998). We focus on surface-level diversity (Harrison et al., 1998), defined as differences in overt

[4] Another stream of research focuses on the opposite linkage, i.e. on the impact of diversity on CSR. Studying such inverse relationship (which is beyond the scope of this study) could also help to reconcile literature on CSR, diversity, and innovation performance - which remain largely separate.

demographic characteristics (Milliken and Martins, 1996, Harrison et al., 2002), and more specifically on gender and nationality.

To extend existing insights, we investigate CSR as a vehicle for valuing such diversity. At the organizational level, Kato and Kodama (2018) identify a direct impact of CSR on gender diversity, providing empirical evidence of that effect[5]. In particular, they leverage signaling theory (Greening and Turban, 2000) to predict that female workers consider strong CSR (or strategic CSR) signals that the firm engages in ethical behaviors and workplace fairness. Strategic CSR thus may enable firms to recruit more female employees, resulting in increased gender diversity. Yet no studies specify the mechanisms through which CSR and diversity might affect outcomes, including technological innovation.

In detailing why so few studies investigate the link between CSR and diversity, Grosser and Moon (2005) acknowledge that many corporations resist gender, just as they reject the business case for CSR. Other corporations view CSR only with a philanthropic lens, rather than as a way to initiate good business practices. Thus, according to these authors, even if CSR may be a tool for improving diversity, the relevant processes supporting this relationship need to be developed. Noting this apparent resistance to diversity, a possible strategy is to incorporate diversity and equality within a firm's CSR agenda, as emphasized by our theoretical framework (Grosser and Moon, 2005; Thorpe-Jones et al., 2010). The transformative potential of CSR offers a means to enact diversity principles to attract, retain, and develop a diverse workforce. Therefore, we investigate the link between CSR and diversity, with the prediction that the value of gender and nationality diversity can be revealed and highlighted through strategic CSR. In line with the value-in-diversity approach (Dass and Parker, 1999), differences and similarities in human capital create both opportunities and costs (Singh and Point, 2004). For the benefits to outweigh the costs, organizational members must learn from one another and work to achieve a common goal. Such a goal may be reached through strategic CSR. As Singh and Point (2004, p. 298) insist, "the strategic response should be proactive" to guarantee "a stronger and wider business case for diversity, particularly important in terms of recruitment of the best talents."

Besides, the lack of research regarding SMEs' CSR strategies (Stoian and Gilman, 2017) and the potential effects of diversity on them is surprising; SMEs account for 99% of all companies in the EU (European Commission, 2015), and they often struggle to recruit and retain

[5] This result contrasts with findings that show that gender diversity in boards can predict CSR (Azmat and Rentschler, 2017; Rao and Tilt, 2016). We thank an anonymous reviewer for pointing at the inverse relationship from diversity to CSR.

a qualified workforce, which could constrain their innovation activities (Perrini et al., 2007). That is, SMEs' characteristics, which distinguish them from large corporations (independent, cash-limited, based on informal relationships), mean they often lack resources, labor, information, knowledge, and management and marketing skills (Freel, 2000), such that they are constrained in their day-to-day operations. However, they also are more flexible and experience less inertia than larger firms (Richard et al., 2013b). They must seek means to increase their organizational performance that differ from the tactics used by large firms, and diversity represents a promising option. By adopting a proactive approach (Torugsa et al., 2012), in which CSR is central to their activity (strategic CSR), they might privilege diversity as a viable means to achieve innovation and organizational performance. SMEs engaged in strategic CSR may be more likely to create optimal staff recruitment practices (Castelo and Rodrigues, 2006) and promote CSR for their workforce (Stoian and Gilman, 2017), such as by promoting and valuing diversity. SMEs' CSR strategies usually require a high degree of involvement from employees (Perrini et al., 2007), because managers seek to make the most effective use of their firm capabilities. In line with these predictions and a strategic CSR perspective, we anticipate that an SME engaged in strategic CSR relies on a diverse workforce, because "difference is necessary to success, no one person or perspective is adequate to respond to the complexity of today's world/CSR issues" (Jenkins, 2009, p. 27).

*Diversity as a mediator of the CSR–innovation relationship*

Few empirical studies test the CSR–innovation link for SMEs. Torugsa et al. (2012) note the importance of proactive CSR for SMEs' financial performance, and Bocquet et al. (2013) show that strategic CSR links specifically to technological innovation, regardless of firm size. Chang (2015) also highlights the importance of proactive (but not responsive CSR) for green innovation performance. Stoian and Gilman (2017) consider how aligning CSR activities with an SME's competitive strategy can encourage its growth. Leveraging the related insights from these studies, we predict that SMEs can use strategic CSR to integrate social goals, including diversity, into their corporate activities.

The relationship between diversity and innovation has been subject to inconclusive findings. According to the value-in-diversity hypothesis, diversity produces more creative operations and greater innovation (Cox and Blake, 1991; Mannix and Neale, 2005). Diverse teams outperform homogenous ones. Both diversity and cohesion among team members increase their effectiveness (Bjornali et al., 2016). Because diversity encourages the contestation of ideas (Herring, 2009), more creativity and superior solutions to problems emerge. Progress and

innovation depend less on “lonely thinkers” with high intelligence than on diverse groups (Herring, 2009). Diversity itself is a complex result of multiple experiences that enrich individual and collective learning (Bantel and Jackson, 1989; Joshi and Roh, 2009), implying its status as an intangible firm asset that can provide a basis for competitive advantages (Bassett-Jones, 2005). However, there may be a dark side to diversity. It can be a source of creativity and innovation, or it might cause misunderstanding, suspicion, and conflict in the workplace (Mannix and Neale 2005; Williams and O’Reilly, 1998). In a review of 80 studies of the effects of diversity on performance in general, Williams and O’Reilly (1998, p. 403) conclude that "diversity appears to be a double-edged sword, increasing the opportunity for creativity as well as the likelihood that group members will be dissatisfied and fail to identify with the group."

Three key considerations inform these mixed results regarding the relationship between diversity and innovation. First, results may vary depending on the various types of diversity and measures of firm performance (Joshi and Roh, 2009). Therefore, we account for two types of diversity and use technological innovation as a measure of performance. Second, dedicated diversity management is required to manage the organizational paradox, such that “if they embrace diversity, they risk workplace conflict, and if they avoid diversity, they risk loss of competitiveness” (Bassett-Jones, 2005, p. 169). We propose that such diversity management may include proactive, strategic CSR responses, in line with a value-in-diversity perspective. Third, prior studies do not always refer to the same level of analysis. Rather than upper management or board levels, we consider the organizational level, which is pertinent for SMEs (Mohammadi et al., 2017).

*Gender diversity*. Several studies indicate positive effects of gender diversity on innovation, in line with the value-in-diversity hypothesis (Diaz-Garcia et al., 2014; Garcia Martinez et al., 2016; Østergaard et al., 2011; Ruiz-Jiménez et al., 2016). Horbach and Jacob (2018) find that gender diversity matters for environmental innovation. According to Ruiz-Jimenez et al. (2016), gender moderates the relationship between capability and innovation. This effect is also delineated by Terruel and Segarra-Blasco (2017), who add that firm size exerts a moderating role, and that SMEs have difficulties capturing gender diversity. This positive association is thus not automatic, and research based on organizational demography (Pfeffer, 1985) and the similarity–attraction paradigm (Byrne, 1971) cites negative influences of diversity on organizational performance and innovation. Quintana-Garcia and Benavides-Velasco (2016) find a significant negative relationship between gender diversity in executive management and initial public offering success. Shehata et al. (2017) also uncover significant negative associations

of both gender and age diversity with firm performance (measured by return on assets), possibly due to the lack of proactive CSR strategies among their target firms.

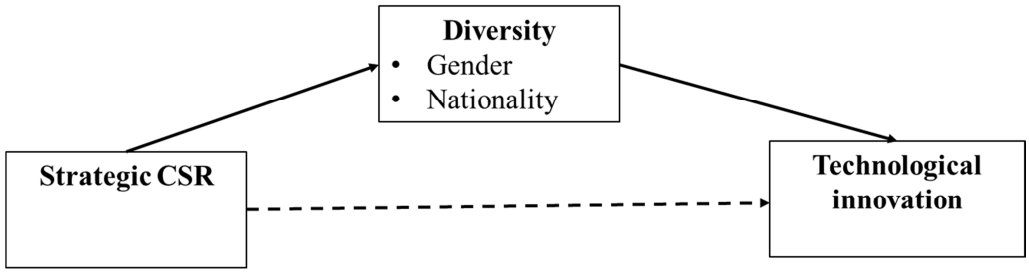
We might attribute the negative impacts of diversity on performance outcomes and innovation to the absence of strategic CSR, which facilitates diversity management. When diversity is not pursued according to a strategic intent, through the implementation of a focused CSR strategy, the results may be counterproductive, leading to negative performance outcomes. The signaling effects of CSR also may be limited if claimed CSR does not match the reality, yet strategic CSR by definition involves more than a mere announcement. Therefore, gender diversity derived from strategic CSR should mediate its link of strategic CSR with SMEs' technological innovation:

**Hypothesis 1**. Strategic CSR has a positive impact on gender diversity, which in turn positively affects SMEs' technological innovation, such that gender diversity mediates the relationship of strategic CSR with technological innovation.

*Nationality diversity*. Nationality diversity has also been shown to have mixed effects on innovation and performance. Østergaard et al. (2011) find no significant effect of ethnic diversity (measured using country of origin or nationality) and Faems and Subramanian (2013) uncover no impact of either gender or nationality diversity on technological innovation. Negative results have also been found. Firms in which foreign workers account for a relatively larger share of total employment appear somewhat less innovative (Ozgen et al., 2011). By contrast, McGuirk and Jordan (2012) specify a positive effect of nationality diversity on product innovation although a negative effect on process innovation is observed. According to Boone et al. (2019), nationality diversity on top management teams enhances innovation. Mohammadi et al. (2017) demonstrate that greater ethnicity diversity (measured by nationality) positively affects radical innovation at the aggregate workforce level. A possible explanation of such mixed results is given by Sharma et al. (2019). They argue that a racially diverse workforce exerts pressure on the organization to adopt CSR-related practices, in accordance with an institutional logic that promotes identities and ethical norms. Hence, these authors see firms as having a capacity to value nationality diversity when relying on a strategic CSR. Thus, we predict that the benefits of nationality diversity on technological innovation accrue when strategic CSR drives this diversity:

**Hypothesis 2**. Strategic CSR has a positive impact on nationality diversity, which in turn positively affects SMEs' technological innovation, such that nationality diversity mediates the relationship of strategic CSR with technological innovation.

In turn, we argue that both gender and nationality diversity mediates the relationship between strategic CSR and technological innovation, as depicted by Figure 1.




*The dotted line represents the relationship that is not individually hypothesized but included as a part of the required procedure for mediation.*

**Figure 1:** Research model

## Empirical methodology

*Data*

Our empirical estimation uses data from a unique survey conducted by the Luxembourg Institute of Socio-Economic Research in 2013, complemented by administrative data. Luxembourg has a higher level of nationality diversity (44.5% foreigners in 2013[6]) than other European countries, in both its general population and its labor market. Among foreign residents, the three most prominent nationalities are Portuguese (36.9% of foreigners), French (14.7%), and Italian (7.6%). In the labor market, foreigners account for 71.3% of the workforce, when we include cross-border workers. Luxembourg is bordered by Belgium, France, and Germany, and French cross-border workers represent 22.1% of the workforce. In addition, in terms of gender diversity, women do not participate in the labor market to the same degree as men, accounting for approximately 44.2%. With these features, Luxembourg offers a compelling context for studying workforce diversity and whether diversity is manifest as a passive response to workforce constraints or as a proactive response that leads to innovation (Cox and Blake, 1991).

[6]http://www.statistiques.public.lu/stat/TableViewer/tableView.aspx?ReportId=12858&IF_Language=fra&MainTheme=2&FldrName=1.

The survey pool includes all Luxemburgish SMEs with 10–250 employees, in line with the European definition of SMEs.[7] The survey administrators constructed stratified random sampling (by firm size and economic sector) of 2,819 firms. The questionnaire, written in French and German but also available in English, was sent to these enterprises in the second week of January 2013. After a reminder in February, the data collection stopped in July and produced 1,348 responses from SMEs, for a response rate of 47.81%. We applied a weighting procedure based on the inverse of the response rate per stratum to obtain representative results for the target SME population.

The survey gathered details about general firm characteristics (size, activity, group membership, workforce qualification, organizational structure) and rich information about CSR strategies and practices, innovation activity, use of information and communication technologies (ICT), and the competitive economic context. To enrich this data set, we merged these survey data with administrative data from the social security administration,[8] which break down employees by gender and nationality at the firm and sector levels.

*Measures*

*Dependent variable*. With the dependent variable *Inno*, we determine whether the SME has introduced a technological (process or product) innovation in the previous three years (0 otherwise). This dummy variable is similar to those used in the Community Innovation Surveys (CIS),[9] defined in accordance with the Oslo Manual (2005). The CIS is a primary source of data for assessing firms have introduced technological innovations, and in 2014, 663 academic studies used these CIS data.[10]

[7] https://ec.europa.eu/eurostat/web/structural-business-statistics/structural-business-statistics/sme?p_p_id=NavTreeportletprod_WAR_NavTreeportletprod_INSTANCE_vxlB58HY09rg&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-2&p_p_col_pos=1&p_p_col_count=4

[8] http://www.mss.public.lu/acteurs/igss/

[9] The survey asked two yes/no questions: "During the last three years, did your enterprise introduce new or significantly improved goods (product or services)?" and "During the last three years, did your enterprise introduce new or significantly improved processes (methods of manufacturing, logistics, delivery or distribution methods, supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting, or computing?"

[10] http://www.globelicsacademy.org/Micheline%20Goedhuys/Micro%20evidence%20on%20innovation,%20data%20and%20research%20applications.pdf

*Independent variables*. We differentiate SMEs according their CSR strategies (strategic vs. responsive) with a two-step classification procedure.[11] First, we conducted a principal component analysis with 15 binary variables (see Appendix A) that reflect the five CSR dimensions (centrality, proactivity, voluntarism, visibility, specificity) proposed by Burke and Logsdon (1996). The Kaiser-Meyer-Olkin score (0.79) and Bartlett's test of sphericity ($p < 0.000$) indicate satisfactory results. Three factors thus summarize SMEs' CSR strategies (43% of the total variance). Second, we performed a non-hierarchical cluster analysis, based on the scores revealed by the factor analysis. To determine the final number of clusters, we use three criteria: statistical accuracy, measured by the ratio of within-cluster to between-clusters variance (Fisher's test); the number of firms per cluster; and the economic significance of the clusters identified. Two clusters emerge in the best version. To interpret them, we calculate the mean of each CSR indicator in each cluster[12] (see Appendix B).

Cluster 1 comprises poor CSR adopters. Mainly concerned with environmental issues, these SMEs have initiated contacts with their main stakeholders (public actors, shareholders, suppliers, customers) (voluntarism). However, their CSR is mostly rhetoric, and they have not implemented any specific practices, except for describing their CSR strategy on their website. These elements suggest a responsive CSR strategy (denoted *Responsive_CSR*). Cluster 2 instead includes SMEs that are very active, with high scores on the centrality, proactivity, specificity, and visibility dimensions. Their CSR is well-anchored in their values, and they favor economic and social aspects (centrality). They dedicate specific resources to sustain their CSR strategy, define priorities, formalize procedures, establish a precise timetable, and evaluate the actions and the choices taken (proactivity, specificity). They are accountable for their actions to their shareholders through dedicated CSR reports (visibility), and CSR practices are at the heart of their strategy. This cluster corresponds to SMEs engaged in strategic CSR (*Strategic_CSR*).

[11] First, we conducted a principle component analysis (PCA), which proved helpful for reducing the 15 dummy CSR variables into fewer factors. It refers to the particular case "where PCA and MCA are equivalent when PCA is conducted on variables that are characterized only by one of their modalities" (Lebart et al. 2006, p. 130). Second, the results of this PCA enable us to run a cluster analysis and obtain two solid clusters that differentiate SMEs that have adopted strategic versus responsive CSR. We do not present the PCA results here, because they represent preparatory stages for the cluster analyses, but they are available on request.

[12] For all comparisons of variances, Fisher's test is significant at the 0.000 level and indicates good differentiation of the firms. In the discriminant analysis, the classification matrix reveals that 96.3% of the observations are correctly classified.

Finally, we note SMEs that do not implement any CSR practices, for which we establish a dummy variable (*no_CSR*).

*Mediating variables.* The diversity variables measure the distributions of gender and nationality within each firm's workforce. In line with previous research (Harrison et al., 1998; McGuirk and Jordan, 2012; Mohammed and Angell, 2004; Richard, 2000; Richard et al., 2004, 2013a), we use the commonly used Blau (1977) index:

$$1 - \sum \quad p_i^2,$$

where $p$ is the proportion represented by a specific group of employees (e.g., male), and $i$ is the number of different groups of employees according to the feature studied (e.g., two groups for gender). If the population is homogeneous (e.g., all employees are male), the Blau index equals 0; if the proportions are equivalent, the Blau index is 0.5. The highest value of the Blau index thus depends on the number of groups in the population. For gender diversity, the maximum value is 0.5, but for nationality diversity, we consider seven nationalities: Luxembourgish employees, employees from the three border countries (Germany, France, and Belgium), and foreign employees whose nationalities also are common in Luxembourg (Portuguese, Italian, and other). The maximum value of the Blau index for nationality diversity thus is 0.86. To normalize the index, we follow Solanas et al. (2012) and divide the index by its maximum value. Diversity in gender and nationality are denoted *Diversity_gend* and *Diversity_nat*, respectively.

*Control variables.* We introduced two series of control variables depending on the relationship tested (see Figure 1). First, to assess the effect of CSR strategy on gender and nationality diversity, we follow prior literature. Because SMEs engaged in CSR activities dedicated to their workforce likely cope better with recruitment and retention challenges, at lower costs (Castelo and Rodrigues, 2006), we include two dummies for the perceived difficulties of hiring non-qualified (*NQ_difficulties*) or qualified (*Q_difficulties*) workers. Consistent with Richard et al.'s (2013a) recommendation, we include gender diversity (*diversity_gend*) as a control variable when considering nationality diversity, and vice versa. For firm size, we differentiate small SMEs (*Small_size*, 10–49 employees) from medium SMEs (*Medium_size*, 50–249 employees). Small SMEs suffer more from a lack of resources, which can affect their socially responsible decisions (Perrini et al., 2007; Stoian and Gilman, 2017); Woodhams and Lupton (2006) confirm that the smallest SMEs perform the least CSR. We also control for whether SMEs belong to a foreign-based group (*Foreign_Group*). With their greater openness and additional resources, these SMEs should be more diverse. We include firm age (*Age*) to account for the maturity of the firms, which is linked to their diversity practices (Withisuphakorn

and Jiraporn, 2016). Finally, we control for economic sectors in which SMEs operate (*manufacturing*, *finance*, *construction*, *transport*, *ICT*, *trade*, and *other*). Variations in diversity practices exist across firms operating in different sectors (Herring, 2009).

Second, to test the CSR/innovation link (in the absence or presence of the diversity mediating variables), we rely on traditional determinants of firms' technological innovation as control variables. Because R&D expenditures are not available in our database, we introduce a dummy *R&D* variable that indicates whether SMEs have internal R&D expenses. To capture the level of education of firms' workforces, we include a dummy variable *Human_capital*. Furthermore, ICT tools can help firms assimilate and exploit knowledge (Chiaroni et al., 2010), so we include an enterprise resource planning (*ERP*) variable. With the dummy variable *Exports*, we acknowledge that exports may enhance firms' innovation, through a learning effect (Cassiman and Golovko, 2011). Resource constraints should have a negative impact on firms' innovation propensity (Damanpour, 1991), leading us to introduce the dummy variable *Growth* in our estimation. It indicates whether firms' turnover has increased more than 5% in the previous three years. The external environment has an effect on SMEs' innovation practices, and firms operating in a fast changing environment innovate more frequently (Covin and Slevin, 1989). We thus include the variable *Uncertainty*, measured as the threats the SME perceives in its competitive environment (i.e., newcomers, product/service obsolescence, rapid product changes, and demand uncertainty). Following Wagner (2010), we consider that firm size may affect its capacity to innovate. Again, we take the sector of activity into account with seven dummies.

Appendix C contains the variable definitions. We present the means, standard deviations and Spearman correlations in Appendices D and E.

*Models and estimation strategy*

Following Surroca et al. (2010), we test the mediation hypotheses (H1 and H2) with an adapted version of the method outlined by Baron and Kenny (1986), seeking to tackle its endogeneity problems. In the classical Baron and Kenny (1986) approach with three regression models[13], the first regresses the mediator (gender or nationality diversity) on the independent variable (CSR). The second model regresses the dependent variable (technological innovation) on the independent variable (CSR), and then the third model regresses the dependent variable (technological innovation) on both the independent variable (CSR) and the mediator (gender or nationality diversity). For our objective to investigate the effect of CSR on innovation through

[13] See for example Andreeva and Kianto (2011) and Zhou (2007) who follow this approach.

gender and nationality diversity, these estimations may suffer from endogeneity bias, particularly that due to reverse causality[14] (Bascle, 2008; Hamilton and Nickerson, 2003; Shaver, 1998). Therefore, our empirical methodology features a two-step procedure with instrumental variables, as recommended by Echambadi et al. (2006) in research settings without panel or experimental data that must rely on cross-sectional data. Greene (2007) and Wooldridge (2010) regard instrumental variables as a classical approach to deal with endogeneity; they also provide a viable option for adapting the classical Baron and Kenny (1986) procedure, because they adequately address sources of endogeneity (Surroca et al., 2010).

In the first stage, we thus analyze the effects of strategic CSR on gender (Model 1A) and nationality (Model 1B) diversity with a Tobit model (the diversity variables are censored dependent variables), using instrumental variables. We seek instrumental variables with a significant effect on diversity but no effect on technological innovation. To avoid any potential correlation between diversity and the error terms in the innovation equation, as suggested by Martin (2017) and Card (2001), our instrumental variables appear on a different level of analysis than we apply to the independent variables (Card, 2001; Echambadi et al., 2006; Martin, 2017; Surroca et al., 2010). That is, the instrumental variables pertain to the sector level, whereas the independent variables refer to the firm level. For gender diversity, we use the percentage of women in each economic sector (*Diversity_gend_sect*). For nationality diversity, we use the percentage of cross-border workers in each economic sector (*Diversity_front_sect*).

In the second stage, similar to Parrotta et al. (2014), we estimate the complete models (Probit Models 3A and 3B) using the predicted values of diversity (gender and nationality) from the first stage. They are denoted, respectively, *Diversity_gend_pred* and *Diversity_nat_pred.*

This adapted version of Baron and Kenny's method must achieve four conditions to establish the mediation predicted in H1 and H2 (Baron and Kenny, 1986; Galbreath, 2018): (1) Strategic CSR must affect gender and nationality diversity (Models 1A and 1B); (2) strategic CSR must affect technological innovation (Model 2); (3) predicted gender and nationality diversity must affect technological innovation (Models 3A and Model 3B); and (4) full mediation requires that the coefficient of strategic CSR, initially significant in Model 2, becomes non-significant when we include gender and nationality diversity (Models 3A and 3B), and partial

[14] For example, the CSR–diversity–innovation link is affected by a feedback loop: CSR affects diversity which affects innovation, even while innovation may also affect the decision to engage in CSR.

mediation demands that the coefficient of strategic CSR must be still significant in the third equation but less than that in the second model (Models 3A and 3B).

**Results**

Table 1 contains the results related to the determinants of the two types of surface-level diversity (gender in Model 1A, nationality in Model 1B). As expected, the two main explanatory variables (strategic and responsive CSR) exert distinct effects. Compared with SMEs that have not adopted CSR, those that have adopted strategic CSR reveal a positive and significant effect on their diversity indexes (both gender and nationality). In contrast, responsive CSR drives gender diversity, with only minimal significance (10% level). Among the control variables, nationality (gender) diversity positively and significantly affects gender (nationality) diversity. Firm size and group membership both have negative, significant effects on nationality diversity but no significant effects on gender diversity. Firm age has a negative effect on both types of diversity. The estimated coefficients for sector variables are also significant. With regard to gender diversity, compared with the construction sector, the other sectors need to broaden their talent base (manufacturing, finance, trade, ICT, and other), except for the transport sector, for which we find no significant effect. The sectors also exhibit negative effects on nationality diversity, with the exception of the finance and other sectors, for which the effect is not significant. Finally, the estimated coefficients for the two instrumental variables (*Diversity_gend_sect* and *Diversity_front_sect*) are positive, affirming the consistency of our estimations.

Table 1 also provides the results of the direct effect of SMEs' CSR strategies on technological innovation (Model 2). Compared with SMEs without CSR, both forms of CSR positively affect technological innovation, though responsive CSR has a slightly stronger effect than strategic CSR does. With regard to the control variables, the traditional drivers of innovation have positive effects (R&D expenses, ERP, past firm growth, environmental uncertainty), with the exception of human capital and exports, which have no significant effect. Compared with medium-sized SMEs, the smallest firms suffer obstacles to innovation due to their lack of resources. Finally, belonging to the financial, trade, and other sectors significantly increases the probability of introducing technological innovations, compared with the construction sector.

[Insert Table 1 about here]

The results in Table 2 reflect the findings of the Probit model that we used to assess the mediating role of diversity on the strategic CSR–innovation link. We cannot confirm H1, because gender diversity does not mediate this relationship (see Model 3A). The predicted gender variable (Diversity_gend_pred) has no significant effect; strategic and responsive CSR remain significant. However, in support of H2, we find a positive effect of predicted nationality diversity on SMEs' technological innovation, after we control for traditional drivers of innovation. Predicted nationality diversity, which results from strategic CSR, among other firm characteristics, exerts partial mediation, with a positive, significant effect on technological innovation after we include both CSR variables (see Model 3B). Thus, the conditions of partial mediation are met. When we compare the coefficient values of strategic and responsive CSR in the presence of the mediator (0.226 and 0.337, respectively), we find that the coefficient is less than that for the same CSR variables in Model 2, with coefficient values of 0.311 and 0.356, respectively. Among the control variables, we find a positive and significant effect of R&D expenditures and ERP on SMEs' technological innovation. Logically, the smallest firms suffer from a lack of resources. Past firm growth also has a positive effect, suggesting the persistence of innovative processes. Similarly, SMEs operating in environments with high levels of uncertainty exhibit a higher probability of introducing technological innovations. The control variables for the sector effect are never significant.

[Insert Table 2 about here]

## Discussion and conclusion

With this research, we draw connections between CSR, diversity, and innovation. Our research provides a key theoretical contribution by combining strategic and institutional perspectives on CSR (Pedersen and Gwozdz, 2014; Porter and Kramer, 2006) with a diversity perspective based on the value-in-diversity hypothesis (Cox and Blake, 1991). We also focus on SMEs, which have been understudied in relation to CSR and diversity despite widespread calls from academics (e.g. Gudmundson and Hartenian, 2000) and stakeholders (e.g., regulators) to address such topics.

### *Theoretical contributions*

We reconcile two disparate literature streams, related to CSR and diversity, by revealing the distinct effects of strategic and responsive CSR on two types of diversity (gender and nationality) and SMEs' technological innovation. Adopting a strategic perspective on CSR and an

institutional approach, we conceive of CSR as a two-dimensional construct (Rasche et al., 2017), for which distinct responses (strategic or responsive) affect SMEs' diversity management efforts and ability to innovate differently (McWilliams and Siegel, 2001). In line with Jenkins (2009), we find that SMEs can take advantage of CSR opportunities if they integrate CSR into their strategy. In particular, they can achieve better outputs from their enhanced (nationality) diversity than firms that are reactive in their CSR. We also show that this benefit is meaningful for SMEs that are constrained in their staff recruitment abilities, thus revealing their capacity to adopt a pro-active approach to institutional pressures, and not merely adhering to expectations from the external environment (Pedersen and Gwozdz, 2014). By developing strategic CSR, SMEs value and can attract diverse, talented people who contribute significantly to their innovation. Thus, it is not diversity by itself but rather SMEs' ability to integrate this diversity into their CSR strategic management that is essential (Cox and Blake, 1991; Mannix and Neale, 2005).

The results of this study find that nationality diversity mediates the strategic CSR–innovation link while gender diversity apparently does not. When SMEs make CSR integral to their strategy, they can benefit from nationality diversity in terms of enhanced innovation. Gender diversity instead does not appear to mediate this link between CSR and innovation, in accordance with studies that indicate gender diversity does not influence innovation (e.g., Faems and Subramanian, 2013) or that strategic CSR leads to gender diversity only at the board level (Mun and Jung, 2018). This result differs from other studies that show that gender diversity at the firm level may be beneficial for innovation (Diaz-Garcia et al., 2014; Garcia Martinez et al., 2016; Horbach and Jacob, 2018; Østergaard et al., 2011; Ruiz-Jiménez et al., 2016). Very recently, Dai et al. (2019) also found a positive relationship between the gender diversity of new venture teams and their innovation performance. Beyond innovation outcomes, gender diversity also fosters strategic change (Triana et al., 2019) and, ultimately, organizational performance (Salloum et al., 2019; Gonzalez and Denisi, 2009). However, as shown in this research, gender diversity may contribute to intergroup biases, reducing the positive effects of diversity on innovation performance (van Knippenberg et al., 2004). In such context, strategic CSR appears less effective[15]. Moreover, literature that identifies a positive effect of gender diversity on innovation mainly focuses on the board (Horbach and Jacob, 2018), research department (Garcia Martinez et al., 2016), or team project (Ruiz-Jimenez et al., 2016) level. Our perspective is different, in that

[15] We thank an anonymous reviewer for pointing that there may be other organizational benefits for gender diversity than innovation.

we measure surface-level diversity at the organizational level. Our choice reflects our acknowledgement that complex innovation processes often span the entire organization, especially in SMEs, such that technological innovation is an organizational capacity, rather just an R&D capacity (Hoffman et al., 1998).

Our study also provides strong support for the value-in-diversity hypothesis (Cox and Blake, 1991) and clarifies a key mechanism by which diversity leads to technological innovation. Previous studies identify a link between demographic attributes and innovation (e.g., Østergaard et al., 2011). We go a step further by showing that nationality diversity, when in accordance with the firm's CSR strategy, is a powerful lever of SMEs' technological innovation. We thus offer new insights into the relationship between diversity and innovation. In this perspective, contradictions in previous literature might reflect an overly simplistic view of diversity, as either positive or negative. The value-in-diversity hypothesis instead suggests that diverse groups provide superior solutions to organizational problems and increase organizational efficiency, effectiveness, and profitability, so diversity can be a source of competitive advantage, if the workplace's heterogeneity favors innovation (Cox and Blake, 1991).

We also specify differentiated mediating impacts of gender and nationality diversity. Gender diversity has no influence on SMEs' technological innovation while nationality diversity partially mediates the relationship between CSR and technological innovation. These findings may reflect theories pertaining to the negative effects of diversity, such as organizational demography (Pfeffer, 1985), social identity, and the similarity–attraction paradigm (Byrne, 1971). In our study context, nationality diversity is more difficult to manage than gender diversity, considering the number of diverse nationalities, such that social processes may be more challenging (Sharma et al., 2019), especially for technological innovation. Yet when nationality diversity results from strategic CSR, managers seemingly can avoid such negative processes by accounting explicitly for the differences, valuing them, and implementing appropriate group cohesion techniques. Considering the lack of influence of gender diversity, Mun and Jung (2018) indicate that the CSR managers they interviewed for their study push for gender diversity only in the upper ranks of the organization. This assertion could explain why we find that gender diversity resulting from strategic CSR does not affect SMEs' innovation; we move beyond managerial or board levels to consider the overall organization. Perhaps the benefits of integrating gender considerations into CSR are not sufficient to offset the costs of such a strategy. Another explanation could come from substitutive relationships of educational and gender diversity, or of nationality and knowledge area diversity (Faems and Subramanian, 2013).

*Managerial implications*

Our analysis provides new insights on the complex relation between CSR and technological innovation in SMEs, stressing the role of strategic CSR to implement diversity that leads to innovation, and thus revealing an area in which SMEs might gain competitive advantages. That is, they should look beyond legislative requirements and institutional pressures by taking a value-added approach to technological innovation. Building support for a diversity initiative requires a clearly defined strategy based on organizational values, reflecting the social aspects of CSR. These aspects are captured by the centrality dimension of Burke and Logsdon's (1996) model. To be effective, a diversity initiative also must become a business reality. Specific managerial and organizational resources, linked to the proactivity, specificity, and visibility dimensions, need to be developed to capitalize on national diversities. Such efforts are particularly critical to reap the benefits of different nationalities, knowledge areas, and cultures. Diverse nationalities by definition feature diverse cultures, and cross-cultural teams offer high creativity potential, even as they confront the challenges of different working and communication styles that require proactive management (Bouncken et al., 2016). Thus nationality diversity should be managed through strategic CSR to overcome any initial difficulties due to different cultures and produce innovation benefits. In particular, SME managers should pursue the valuable benefits of nationality diversity, as long as they already have implemented strategic CSR.

*Limitations and avenues for further research*

This study contains several limitations that pave the way for further research. First, we rely on the business case for CSR and the value-in-diversity hypothesis. Continued research could reconsider the business case; though frequently used, it is not the only rationale, and we call for research to address social justice and moral cases for diversity, which are central to CSR. Second, we do not differentiate types of technological innovations (e.g., product vs. process) or the goals of the innovative efforts (e.g., environmental purposes). Third, limited data availability prevented us from accounting for the role of the founder, though the personal beliefs of SME founders (e.g., owner–managers) tend to be more influential than those of managers of large firms (Rasche et al., 2017). Relevant extensions could study the effects of managers' leadership styles. Fourth, we use a cross-sectional research design, and more studies are needed to detail the potentially evolving, dynamic relationships of CSR, diversity, and innovation over time, as well as the recursive linkage between CSR and diversity (Yasser et al., 2017). Finally, diversity takes various forms. Most researchers study one or two types, and nationality and gender are popular

choices. But other types of diversity, especially deep-level forms (Harrison et al., 1998), deserve greater attention; in particular, research should address diversity in cultures, values, skills, knowledge, personality, or organizational tenure. In particular, nationality diversity may encompass more variety than what we capture with the commonly used Blau index. Such diversity would be higher if more nationalities (especially those beyond Europe) were included. Due to its similarity to cultural diversity, this type of surface-level diversity can be "indicative of deeper-level differences, such as cognitive processes/schemas, differential knowledge base, different sets of experiences, and different views of the world" (Shore et al., 2009, p. 118). With more diverse nationalities, ideas and creativity might be enhanced, which could lead to enhanced innovation performance (Mohammadi et al., 2017). However, while the composition of nationality diversity is well suited for European countries that share quite similar cultures and values, it may appear as insufficient in the context of regions such as Asia (e.g. Yasser et al., 2017) or the Middle East (e.g. Salloum et al., 2019), which show a high degree of variety within the same region in terms of national institutions, cultural values and economic development. In such contexts, one could consider cultural diversity, a less visible type of diversity than nationality diversity, since these two types of diversity may be not mutually exclusive (Milliken and Martins, 1996).

Despite these limitations, this research sheds new light on the relationship between CSR, diversity and innovation in SMEs, acknowledging that the relationship between strategic CSR and technological innovation may be mediated by diversity, particularly in terms of nationality.

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**Table 1:** Relationship between CSR strategies and workforce diversity (Tobit model)

| | MODEL 1A | MODEL 1B | MODEL 2 |
|---|---|---|---|
| | Diversity_gend | Diversity_nat | Inno |
| Strategic_CSR | 0.0442627**<br>(0.0212121) | 0.0422457**<br>(0.0206398) | 0.3105957**<br>(0.1241287) |
| Responsive_CSR | 0.0426748*<br>(0.0235544) | 0.0020014<br>(0.0225409 | 0.3564222***<br>(0.1392221) |
| No_CSR | Ref. | Ref. | Ref. |
| NQ_difficulties | 0.0123861<br>(0.0332467) | -0.0067363<br>(0.0284827) | / |
| Q_difficulties | -0.0093261<br>(0.0195871) | 0.0376821**<br>(0.0170716) | / |
| Diversity_gend | / | 0.1016125***<br>(0.0277702) | / |
| Diversity_nat | 0.1075825***<br>(0.0297348) | / | / |
| Small | -0.0152206<br>(0.0209788) | -0.0779706***<br>(0.0184018) | -0.4408674***<br>(0.1183923) |
| Medium_size | Ref. | Ref. | Ref. |
| Foreign_group | -0.0267134<br>(0.0198248) | -0.0562273***<br>(0.0177935) | / |
| Age | -0.0334148**<br>(0.0149624) | -0.0588571***<br>(0.0144533) | / |
| Manufacturing | 0.1469495***<br>(0.0256828) | -0.0675998***<br>(0.0249802) | 0.2120459<br>(0.1370628) |
| Finance | 0.5234644***<br>(0.0326513) | -0.0153299<br>(0.0262981) | 0.4965774***<br>(0.1589528) |
| Trade | 0.2983202***<br>(0.0271917) | -0.1201086***<br>(0.0223679) | 0.2476716**<br>(0.1122541) |
| Transport | 0.0299832<br>(0.024761) | -0.1215518***<br>(0.0283239) | 0.023675<br>(0.1487717) |
| ICT | 0.2855736***<br>(0.0323913) | -0.0605044**<br>(0.0303272) | 0.2806175<br>(0.1948716) |
| Other_Sect | 0.2578417***<br>(0.0358282) | 0.0138848<br>(0.0214943) | 0.3687548***<br>(0.1432872) |
| Construction | Ref. | Ref. | Ref. |
| Diversity_front_sect | / | 0.0020263***<br>(0.0006766) | / |
| Diversity_gend_sect | 0.0019628***<br>(0.0006274) | / | / |
| R&D | / | / | 0.4066044***<br>(0.0914394) |
| Human_capital | / | / | -0.002774<br>(0.1196666) |
| ERP | / | / | 0.2534549***<br>(0.0817478) |
| Exports | / | / | 0.075844<br>(0.2024415) |
| Growth | / | / | 0.287161***<br>(0.077171) |
| Uncertainity | / | | 0.1529827***<br>(0.0372655) |
| Constant | 0.2477621***<br>(0.0290447) | 0.5840038***<br>(0.0429293) | -0.8958508***<br>(0.197711) |
| Number of observations | 1,348 | 1,348 | 1,348 |
| Pseudo $R^2$ | 0.9072 | 1.5739 | 0.0905 |
| Log pseudo-likelihood | -68.004637 | 60.98743 | -1313.3909 |

*** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Notes: Coefficient values. Standard errors are in brackets.

**Table 2:** Relationship of predicted diversity (gender and nationality), CSR, and technological innovation (Probit)

| | MODEL 3A | MODEL 3B |
|---|---|---|
| | Inno | Inno |
| Diversity_nat_pred | / | 1.804541** (0.7433622) |
| Diversity_gend_pred | 1.002448 (0.8971721) | / |
| Strategic_CSR | 0.2595854** (0.1316613) | 0.2261588* (0.1303216) |
| Responsive_CSR | 0.3088664** (0.1451775) | 0.3378337** (0.1393815) |
| No_CSR | Ref. | Ref. |
| R&D | 0.4123625*** (0.0915955) | 0.3977495*** (0.0916488) |
| Human_capital | -0.0230499 (0.1199791) | 0.0079112 (0.1195625) |
| ERP | 0.2526552*** (0.0817579) | 0.2519508*** (0.0818552) |
| Exports | 0.072375 (0.2016034) | 0.0766411 (0.2030741) |
| Growth | 0.2917031*** (0.0772586) | 0.3016081*** (0.0774182) |
| Uncertainty | 0.1504797*** (0.0373423) | 0.1504205*** (0.0373718) |
| Small_size | -0.4203122*** (0.1196378) | -0.2973764** (0.131802) |
| Medium_size | Ref. | Ref. |
| Manufacturing | 0.0328538 (0.2086486) | 0.0608311 (0.1525239) |
| Finance | -0.1223084 (0.570958) | 0.2571455 (0.1861157) |
| Construction | Ref. | Ref. |
| Transport | -0.0027687 (0.1491008) | 0.024455 (0.1485215) |
| ICT | -0.0465174 (0.3451) | 0.1286033 (0.2046553) |
| Other_sect | 0.0099402 (0.3451007) | 0.0882185 (0.1867052) |
| Trade | -0.1396735 (0.3633648) | -0.0281042 (0.1586607) |
| Constant | -1.187674*** (0.3341132) | -1.962012*** (0.4801744) |
| Number of observations | 1,348 | 1,348 |
| Pseudo $R^2$ | 0.0913 | 0.0942 |
| Log pseudo-likelihood | -1312.2897 | -1308.039 |

*** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Notes: Coefficient values. Standard errors are in brackets.

**Appendix A**. Questionnaire items reflecting the five CSR dimensions

1. *In 2012, as part of your CSR approach, did your company come into contact with the following actors for ...? (Voluntarism)*

| | | Yes | No |
|---|---|---|---|
| A | NGO | ▪ | ▪ |
| B | Government agencies | ▪ | ▪ |
| C | Investors/shareholders | ▪ | ▪ |
| D | Customers/suppliers/subcontractors | ▪ | ▪ |

2. *Does your company have a document describing the values and priority concerns and/or motivations of your company in social and environmental terms? (Centrality)*

| Yes | No |
|---|---|
| ▪ | ▪ |

3. *Which area is concerned by your CSR approach? (Centrality)*

| | | Yes | No |
|---|---|---|---|
| A | Economy (e.g. quality label) | ▪ | ▪ |
| B | Environment (e.g., waste reduction) | ▪ | ▪ |
| C | Social (e.g. diversity) | ▪ | ▪ |

4. *Does your enterprise …? (Proactivity)*

| | | Yes | No |
|---|---|---|---|
| A | Appoint one or more people to carry out their CSR approach | ▪ | ▪ |
| B | Set measurable targets for CSR (e.g., reduction of x% of waste, increase of x% of women in positions of responsibility, ...) | ▪ | ▪ |

5. *Does your enterprise … ? (Specificity)*

| | | Yes | No |
|---|---|---|---|
| A | Drawn up a schedule for the CSR actions you wish to carry out? | ▪ | ▪ |
| B | Develop a procedure to monitor and / or control the implementation of its CSR approach | ▪ | ▪ |

6. *Where is your CSR policy described? (Visibility)*

| | | Yes | No |
|---|---|---|---|
| A | In your activity report | ▪ | ▪ |
| B | In a report dedicated to CSR | ▪ | ▪ |
| C | On your Web site | ▪ | ▪ |

**Appendix B**. CSR clusters

| | Mean | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | StakePublic | StakeInvest | StakeSupply | Doc | Agenda | Plan | ComReport | ComDed_Report | EmployD | ObjectiveD | Eco | Env | Soc | StakeNGO | ComWeb |
| *Question used (see. Appendix A)* | *1B* | *1C* | *1D* | *2* | *5A* | *5B* | *6A* | *6B* | *4A* | *4B* | *3A* | *3B* | *3C* | *1A* | *6C* |
| | | | | | | | | | | | | | | | |
| Cluster 1 : Responsive CSR (n=132) | **.73** | **.52** | **.89** | .49 | .15 | .12 | .17 | .14 | .42 | .33 | .46 | **.93** | .45 | .31 | .33 |
| Cluster 2: Strategic CSR (n=190) | .54 | .32 | .64 | **.82** | **.66** | **.70** | **.27** | **.25** | **.74** | **.64** | **.64** | .85 | **.64** | **.35** | **.41** |
| Total | .61 | .40 | .74 | .68 | .45 | .46 | .23 | .20 | .61 | .51 | .57 | .88 | .56 | .34 | .37 |

Notes: Mean values in bold are significantly higher in the considered cluster. The sum of the two clusters is 322. The difference between the 1348 responses and 322 represents the majority of firms with no CSR strategy.

**Appendix C**. Variable definitions

| VarName | Label |
|---|---|
| Diversity_nat | Normalized Blau's index of heterogeneity (val. Max) based on 7 categories of nationality (French, German, Portuguese, Belgium, Italian, Luxemburgish, other nationalities) |
| Diversity_gend | Normalized Blau's index of heterogeneity (val. Max) based on 2 categories of gender (female and male) |
| Inno | =1 if the SME has introduced process or product innovation in the last 3 years, 0 otherwise |
| Strategic_CSR | = 1 if the SME belongs to strategic CSR cluster profiles, 0 otherwise |
| Responsive_CSR | = 1 if the SME belongs to responsive CSR cluster profiles, 0 otherwise |
| No_CSR (ref.) | = 1 if the SME has not adopted or doesn't plan to adopt CSR, 0 otherwise |
| NQ_difficulties | = 1 if the SME perceives difficulties to hire non-qualified workers, 0 otherwise |
| Q_difficulties | = 1 if the SME perceives difficulties to hire qualified workers, 0 otherwise |
| Diversity_gend_sect | Percentage of females in each economic sector |
| Diversity_front_sect | Percentage of cross-border workers in each economic sector |
| Small_size | = 1 if the SME has 10 to 49 employees, 0 otherwise |
| Medium_size (ref.) | = 1 if the SME has 50 to 249 employees, 0 otherwise |
| Foreign_Group | = If the SME belongs to a group whose is headquarters located in a foreign country, 0 otherwise |
| Age | = 1 if the SME was created at least 15 years ago, 0 otherwise |
| Manufacturing | =1 if the SME operates in the manufacturing sector, 0 otherwise |
| Transport | =1 if the SME operates in the transport sector, 0 otherwise |
| Finance | =1 if the SME operates in the finance sector, 0 otherwise |
| Construction (ref.) | =1 if the SME operates in the construction sector, 0 otherwise |
| ICT | =1 if the SME operates in the ICT sector, 0 otherwise |
| Trade | =1 if the SME operates in the trade sector, 0 otherwise |
| Other_sect | =1 if the SME operates in other sectors, 0 otherwise |
| R&D | If the SME undertakes internal R&D activity, 0 otherwise |
| Human_capital | = 1 if the percentage of employees with higher education (incl. post-secondary college and university) is greater than 25%, 0 otherwise |
| ERP | =1 if the firm uses enterprise resource planning systems, 0 otherwise |
| Exports | = 1 if the SME sells its products abroad |
| Growth | = 1 if the SME turnover has increased of 5% at least during the last 3 years, 0 otherwise |
| Uncertainty | Sum of the threats perceived as high in the competitive environment: newcomers, products/services obsolescence, rapid change in products, and demand uncertainty (from 0 to 4). |

**Appendix D.** Means, standard deviations and Spearman correlations (*** when p <= 0.01) for the variables introduce in models1A, 1B and 2 (Obs = 1348)

| | Mean | SD | 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Diversity_gend | 0.54 | 0.32 | 1.0000 | | | | | | | | |
| 2. Diversity_nat | 0.60 | 0.25 | 0.2435*** | 1.0000 | | | | | | | |
| 3. Strategic_CSR | 0.10 | 0.30 | 0.1071*** | 0.0863*** | 1.0000 | | | | | | |
| 4. Responsive_CSR | 0.08 | 0.27 | 0.0484 | 0.0260 | -0.0994*** | 1.0000 | | | | | |
| 5. NQ_difficulties | 0.06 | 0.24 | 0.0136 | 0.0165 | -0.0443 | -0.0425 | | | | | |
| 6. Q_difficulty | 0.15 | 0.36 | 0.0577 | 0.0917*** | 0.0712*** | 0.0090 | 1.0000 | | | | |
| 7. Small | 0.88 | 0.32 | -0.0532 | -0.1094*** | -0.0910*** | -0.0727*** | 0.2600*** | 1.0000 | | | |
| 8. Medium_size | 0.12 | 0.31 | 0.0400 | 0.1030*** | 0.0884*** | 0.0773*** | 0.0430 | -0.1015*** | 1.0000 | | |
| 9. Foreign_group | 0.22 | 0.41 | 0.1335*** | -0.0280 | 0.1327*** | -0.0146 | -0.0406 | 0.0949*** | -0.9815*** | 1.0000 | |
| 10. Age | 0.34 | 0.47 | -0.0945*** | -0.1574*** | -0.0352 | -0.0462 | -0.0617 | 0.0627 | -0.1991*** | 0.1912*** | 1.0000 |
| 11. Manufacturing | 0.12 | 0.33 | -0.0812*** | 0.0076 | -0.0169 | 0.0732*** | -0.0114 | -0.0579 | 0.1082*** | -0.1111*** | 0.0343 |
| 12. Finance | 0.11 | 0.32 | 0.3988*** | 0.0736*** | 0.0744*** | -0.0048 | -0.0093 | -0.0048 | -0.0835*** | 0.0891*** | -0.0038 |
| 13. Trade | 0.24 | 0.43 | 0.2418*** | 0.1375*** | 0.0066 | -0.0554 | -0.0629 | 0.0678 | -0.0479 | 0.0454 | 0.3492*** |
| 14. Transport | 0.11 | 0.30 | -0.2422*** | -0.1204*** | -0.0186 | -0.0675 | 0.0849*** | -0.0054 | 0.0557 | -0.0609 | -0.0929*** |
| 15. ICT | 0.07 | 0.25 | 0.0473 | 0.0180 | 0.0119 | 0.0090 | -0.0281 | -0.0593 | -0.0134 | 0.0100 | 0.0494 |
| 16. Other_sect | 0.12 | 0.32 | 0.1211*** | 0.1027*** | 0.0372 | 0.0991*** | -0.0427 | 0.0630 | -0.0474 | 0.0513 | 0.0914*** |
| 17. Diversity_front_sect | 54.72 | 11.47 | -0.1546*** | 0.0040 | -0.0008 | -0.0120 | 0.0294 | 0.0279 | -0.0052 | 0.0024 | -0.0468 |
| 18. Diversity_gend_sect | 28.7 | 21.29 | 0.5203*** | 0.1889*** | 0.0845*** | 0.0255 | -0.0422 | 0.0446 | 0.0195 | -0.0162 | 0.0571 |

| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|
| 10. Age | 1.0000 | | | | | | | | |
| 11. Manufacturing | -0.1013*** | 1.0000 | | | | | | | |
| 12. Finance | -0.0164 | -0.1327*** | 1.0000 | | | | | | |
| 13. Trade | -0.0895*** | -0.2096*** | -0.2037*** | 1.0000 | | | | | |
| 14. Transport | 0.0985*** | -0.1273*** | -0.1237*** | -0.1953*** | 1.0000 | | | | |
| 15. ICT | 0.0979*** | -0.0977*** | -0.0949*** | -0.1499*** | -0.0910*** | 1.0000 | | | |
| 16. Other_sect | 0.0347 | -0.1361*** | -0.1323*** | -0.2088*** | -0.1269*** | -0.0973*** | 1.0000 | | |
| 17. Diversity_front_sect | 0.0008 | 0.2083*** | -0.0921*** | -0.2649*** | 0.2468*** | 0.2212*** | -0.1174*** | 1.0000 | |
| 18. Diversity_gend_sect | -0.0145 | -0.1892*** | 0.3378*** | 0.3909*** | -0.2871*** | -0.0728*** | 0.3386*** | -0.3769*** | 1.0000 |

**Appendix E.** Means, standard deviations and Spearman correlations (*** when p <= 0.01) for the variables introduce in models 3A and 3B (Obs = 1348)

| | Mean | SD | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Inno | 0.29 | 0.45 | 1.000 | | | | | | |
| 2. Diveristy_nat_pred | 0.61 | 0.60 | 0.1869*** | 1.000 | | | | | |
| 3. Diversity_gend_pred | 0.55 | 0.54 | 0.1359*** | 0.7397*** | 1.000 | | | | |
| 4. Strategic_CSR | 0.10 | 0.30 | 0.1049*** | 0.2374*** | 0.1602*** | 1.000 | | | |
| 5. Responsive_CSR | 0.08 | 0.27 | 0.1112*** | 0.0759*** | 0.0822*** | -0.0994*** | 1.000 | | |
| 6. R&D | 0.24 | 0.43 | 0.1985*** | 0.1163*** | 0.0477 | 0.0808*** | 0.1145*** | 1.000 | |
| 7. Human_capital | 0.76 | 0.43 | -0.1031*** | -0.2116*** | -0.3721*** | -0.0851*** | -0.0409 | -0.1813* | 1.000 |
| 8. ERP | 0.32 | 0.47 | 0.1398*** | 0.0542 | -0.0110 | 0.0904*** | 0.0872*** | 0.1531* | -0.0718* |
| 9. Exports | 0.03 | 0.17 | 0.0497 | 0.0565 | 0.0969*** | 0.0379 | -0.0233 | 0.1229* | -0.2395* |
| 10. Growth | 0.39 | 0.49 | 0.1208*** | 0.0247 | 0.0333 | 0.0315 | 0.0166 | 0.0473 | -0.0404 |
| 11. Uncertainty | 0.85 | 0.99 | 0.1157*** | -0.0270 | -0.0798*** | -0.0046 | 0.0518 | 0.0784* | -0.0343 |
| 12. Small_size | 0.88 | 0.32 | -0.1492*** | -0.3089*** | -0.0871*** | -0.0910*** | -0.0727*** | -0.0689 | 0.0020 |
| 13. Medium_size | 0.12 | 0.31 | 0.1486*** | 0.2980*** | 0.0813*** | 0.0884*** | 0.0773*** | 0.0767* | -0.0029 |
| 14. Manufacturing | 0.12 | 0.33 | 0.0571 | 0.0167 | -0.1230*** | -0.0169 | 0.0732*** | 0.2096* | 0.1227* |
| 15. Finance | 0.11 | 0.32 | 0.0551 | 0.2173*** | 0.6168*** | 0.0744*** | -0.0048 | -0.0195 | -0.4200* |
| 16. Transport | 0.11 | 0.30 | -0.0635 | -0.3342*** | -0.3732*** | -0.0186 | -0.0675 | -0.1004* | 0.1271* |
| 27. ICT | 0.07 | 0.25 | 0.0669 | 0.0224 | 0.0813*** | 0.0119 | 0.0090 | 0.1715* | -0.3801* |
| 18. Others_sect | 0.12 | 0.32 | 0.0688 | 0.2955*** | 0.1867*** | 0.0372 | 0.0991*** | 0.0783* | -0.1488* |
| 19. Trade | 0.24 | 0.43 | -0.0165 | 0.3826*** | 0.3659*** | 0.0066 | -0.0554 | -0.1210* | 0.2307* |

| | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8. ERP | 1.000 | | | | | | | | | | |
| 9. Exports | 0.0572 | 1.000 | | | | | | | | | |
| 10. Growth | 0.0695 | 0.0276 | 1.000 | | | | | | | | |
| 11. Uncertainty | 0.0533 | -0.0274 | -0.0771* | 1.000 | | | | | | | |
| 12. Small_size | -0.0769* | -0.0016 | -0.0536 | -0.0318 | 1.000 | | | | | | |
| 13. Medium_size | 0.0810* | 0.0038 | 0.0493 | 0.0399 | -0.9815* | 1.000 | | | | | |
| 14. Manufacturing | 0.1099* | 0.0238 | 0.0171 | 0.0183 | -0.0835* | 0.0891* | 1.000 | | | | |
| 15. Finance | -0.0701* | 0.0941* | 0.0038 | -0.1265* | -0.0479 | 0.0454 | -0.1327* | 1.000 | | | |
| 16. Transport | -0.0647 | -0.0214 | -0.0440 | 0.0720* | -0.0134 | 0.0100 | -0.1273* | -0.1237* | 1.000 | | |
| 17. ICT | 0.0709* | 0.1229* | 0.0406 | 0.1277* | -0.0474 | 0.0513 | -0.0977* | -0.0949* | -0.0910* | 1.000 | |
| 18. Others_sect | 0.0332 | 0.0243 | 0.0612 | -0.0225 | -0.0052 | 0.0024 | -0.1361* | -0.1323* | -0.1269* | -0.0973* | 1.000 |
| 19. Trade | -0.0385 | -0.0636 | -0.0185 | -0.0223 | 0.0557 | -0.0609 | -0.2096* | -0.2037* | -0.1953* | -0.1499* | -0.2088* |