

# The enabling role of formalized corporate networks to drive small and medium-sized enterprises toward sustainability

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## Abstract

The global economy's transition toward more sustainable development models is undoubtedly grounded on small and medium-sized enterprises (SMEs). However, SMEs, individual entrepreneurs, and microenterprises have always encountered barriers to implementing social responsibility and sustainability concepts. The paper investigates the enabling role of formalized corporate networks to drive SMEs toward sustainable behaviors. A quantitative nonlinear regression approach is applied to a content analysis of a sample of network contracts coded. The content analysis is applied to analyze the declared objectives, the purpose of the contract, and sustainability areas. An ordered logistic regression is applied on variables related to the behavior of SMEs before entering in the contract and post-adhesion phases. Data demonstrates how networks of SMEs can be used as enabling factors to boost sustainability among them. Specifically, the study is based on a sample of 96 formalized network contracts (FNCs), including 1486 Italian SMEs in that sustainability-oriented networks. It offers an evidence-based perspective on how networks of companies can play a fundamental role in the development of policies aimed at bringing small companies closer to the concept of sustainability (such as eco-innovations, eco-efficiency, environmental performance, and social innovations, among others) and its practical implementation. This paper has two significant strengths. The first is that it uses as a sample a set of 1486 companies, including individual entrepreneurs and microenterprises, whose data are usually difficult to collect. The second is that it demonstrates the efficacy of a contractual form that could be scalable to different countries.

## KEYWORDS

eco-efficiency, eco-innovations, environmental performance, formalized network contracts (FNCs), green networks, green supply chain, small and medium-sized enterprises (SMEs), sustainability-oriented networks

## 1 | INTRODUCTION

The ecological transition of the European economy will not be successful without a deep engagement with small and medium-sized

enterprises (SMEs). Letting out SMEs from the European policies, for instance, the European Green New Deal or the Recovery fund, would mean to pull out the 99% of the European companies, which represent the 64% of the overall environmental impact in Europe and the

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60% of the workforce (Isensee et al., 2020; Journeault et al., 2021). Unequivocally, scholars from diverse backgrounds agree upon the limits that SMEs face when trying to be involved in the sustainability-oriented transition (Fassin et al., 2015).

At a cognitive level, the literature explains SMEs' corporate unsustainability as a result of the inconsistency of the existing paradigms, like corporate social responsibility (CSR), or creation of shared value (CSV) to address sustainability issues at firm level (Hörisch et al., 2015; Johnson, 2013, 2015; Johnson & Schaltegger, 2016). Indeed, on the pragmatic side, small entrepreneurs identify a plethora of barriers in adopting socially responsible behaviors, among which there are lack of knowledge, limited resources (time and financial and human capital ones) and practical suitability of the tools (Spence, 2014; Vázquez-Carrasco & López-Pérez, 2012). However, a positive contribution comes from Spence (2014) who affirms that not all is lost, as small entrepreneurs prefer to be proactively involved in sustainability, applying an ethic of care. This is demonstrated recently in the paper of Handrito et al. (2021).

In the past, several studies have been run to offer solutions to SMEs in solving market competitiveness and resource efficiency issue. One way out has been the adoption of collaboration strategies and strategic network alliances (Freeman et al., 2006; Håkansson & Snehota, 2006; Kirkels & Duysters, 2010; Lee et al., 2012). Both formal and informal (Gulati, 1998, 1999) studies on corporate networks have addressed the topics of network performances, interpersonal and organizational features, and the distribution of power between networks' members (Keast et al., 2004; Keast et al., 2007; MacGregor, 2004; Mandell et al., 2016; Mandell & Keast, 2008; O'Donnell, 2004; Storey, 1994).

The main idea of this study is to understand how SMEs could derive benefits in creating corporate alliances to overcome the barriers they face in the sustainability transition. The definition of sustainability transition here adopted, intended as the main aim of the corporate network, includes several trends recognized by scholars as representative of an increased importance toward a sustainability-oriented behavior. Examples are an ecological transition through sustainability-oriented innovations (Carfora et al., 2021a; Donbesuur et al., 2021; Klewitz, 2017; Klewitz & Hansen, 2014); the social side of sustainability, including social innovations, social enterprises, and commons (Bitzer & Hamann, 2015); and organizational sustainability where sustainable business models are an integrative part (Bocken et al., 2014; Boons & Lüdeke-Freund, 2013; Geissdoerfer et al., 2018; Morioka et al., 2018; Norese et al., 2020).

A paucity of works discusses how SMEs may use networks as a driver for sustainability. Innovative SMEs and start-ups are usually privileged subjects of analysis, while qualitative studies and case studies on sustainable supply chains networks are today the most applied methodologies. Conversely, quantitative studies are still rare. In this paper, an ordered logistic regression is applied on data collected on 96 formalized network contracts (FNCs) with a sustainability orientation and including 1486 Italian SMEs. FNCs are a voluntary norm-making approach to manage collaboration and to enhance business

performances of networked companies established by the Italian legal framework.

In this paper, we try to answer to the call of Spence (2014) about the need of further studies to address the responsible behavior of micro-companies and SMEs, individual entrepreneurs, and embedded local companies. We also ask if this self-imposed normative-making approach represented by the FNC could be a real possibility for an SME to make a sustainable transition (RQ1). Consequently, we investigate to what extent FNCs have been developed to match sustainability criteria (RQ2) and how sustainability is concretely implemented inside the FNC in terms of objectives (RQ3).

Summarizing, according to the small business social responsibility (SBSR) theory (Johnson & Schaltegger, 2016), sustainability is hard to achieve in small businesses, while the network approach in SMEs could entail positive results for the business success (von Høivik & Shankar, 2011). With an evident lack of studies on SBSR in formalized network of SMEs, our study would like to offer a concrete contribution on the application of such business model innovations, generating high-challenging social and managerial implications.

The remainder of the paper is organized as follows. Section 2 presents a discussion of the main studies on SME networking and sustainability in SMEs within the networks. Section 3 presents the methodology and the sample analyzed, while Section 4 is dedicated to present and discuss the results. Finally, conclusions are presented in Section 5 where social and managerial implications of our study are discussed.

## 2 | THEORETICAL BACKGROUND

### 2.1 | Corporate networks of SMEs

Firms' networking may adopt different configurations, and its definition could vary according to the degree of formalization applied (Oliver & Ebers, 1998). Nevertheless, there is a shared consensus among scholars, regarding the new opportunities that these networks can offer in terms of increasing companies' competitiveness by leveraging common practices, knowledge, and innovation, improving coproduction processes, gaining market share, extending and integrating supply chains, decreasing costs, deploying new offerings, integrating and leveraging innovation strategies, and other competitive factors (Barringer & Harrison, 2000; Shaw, 2006). One of the main differences between formal and informal networks is that in case of informal ones, personal social networks and geographical proximity leverage the relational capital, enhancing corporate performance and competitive advantage (Chow & Chan, 2008; Li et al., 2015). Usually, informal networks are privileged by SMEs for the degree of flexibility guaranteed.

In the last decade, SME networks have been studied for their potential to overcome insufficient resources and organizational constraints, especially if compared to large companies (Díaz-Chao et al., 2016; Gulati, 2007; Haase & Franco, 2015; Kogut, 2000; Lin & Lin, 2016; Michaelides et al., 2013; Schoonjans et al., 2013). For this

purpose, according to Jeong et al. (2019), a corporate network “is identified as a set of formally connected relationships developed from business-relevant exchanges between actors” (p. 4). Consequently, the literature has presented studies on micro-entrepreneurs' networks (Darbi & Knott, 2016); environmental and social innovation-led networks (Carfora et al., 2021a, 2021b; Clifton et al., 2010; Colombo et al., 2012; Gronum et al., 2012; Gronum et al., 2016); efficiency-led networks (Lin & Lin, 2016); knowledge exchange and technology-led networks (Konsti-Laakso et al., 2012); and networks dedicated to internationalization (Asemokha et al., 2019; Eberhard & Craig, 2013; Haddoud et al., 2017; Jin & Jung, 2016) or to develop new product and processes (Mazzola et al., 2016; Mazzola & Perrone, 2013; van de Vrande et al., 2009).

The choice of being part of a network requires small entrepreneurs to radically change the closed mentality for progressively adopting a business routine based on interorganizational relationships (Lai et al., 2015). As a consequence, it has been stated that the competitive advantages for SMEs networking rely on the availability of a wide range of skills and innovative technologies; the possibility of reaching higher production volumes; increasing the overall market presence; and achieving legitimacy (Crossley et al., 2021; Mezgár et al., 2000; Rubino et al., 2019; Rubino & Vitolla, 2018). Quite recently, the interest of scholars is moving to understand and explore the uptake of CSR as part of an SME agenda, especially through the redesign of different variables related to industrial clusters (Bellandi et al., 2021; Tartaruga & Sperotto, 2021; Vnuk & O'Connor, 2021). What researchers are demonstrating is that the relationship between the critical performativity of SMEs in clusters and the social responsibility/environmental protection is becoming even more embedded than in the past as a quasi-natural evolution toward the creation of shared value between small businesses and the surrounding environment (Alberti & Belfanti, 2021). In line with this, our paper presents a micro-perspective of the phenomenon in the view of formal network.

## 2.2 | Sustainability in SMEs and the enabling role of business network

Studies of business ethics scholars confirm that SMEs face several issues in implementing a sustainable behavior justifying that, to survive financially, the company must be unsustainable. Small entrepreneurs explain their decisions pointing out the inconsistency of the existent tools to address sustainability (Hörisch et al., 2015; Johnson, 2013, 2015; Johnson & Schaltegger, 2016). The aversion toward becoming socially and environmentally responsible is explained by the lack of knowledge and resources (time and financial and human ones) that, conversely, large companies have (Baumann-Pauly et al., 2013; Fernandez & Camacho, 2016; Spence, 2014; Tomšič et al., 2015; Vázquez-Carrasco & López-Pérez, 2012). For this study, we address sustainability, CSR, and stakeholder management as similar concepts, according to the Euclidean demonstration given by

the study of Fassin et al. (2015) who discover how the geographical context influences how small entrepreneurs describe and perceive sustainability.

More than 15 years ago, Perrini (2006) has argued that European SMEs are more actively involved with CSR when they have great relationship networks. Being part of a network increases the likelihood for SMEs to develop a profound sense of awareness toward sustainability issues and, as a consequence of that, increase their responsiveness (Vurro et al., 2009). This is due to the role of the network as enablers of cognitive multiplication in sharing good practices and defining shared strategic paths (Rullani, 2010). Relationships among firms in social networks can affect CSR: Small firms are more sensitive to the behavior of their partners, and their engagement on sustainability issues is more persuasive and institutionally influential than that of larger firms (Boakye et al., 2020; Martinez-Conesa et al., 2017). Following Klewitz (2017), sustainable SMEs interact with their external environment more frequently than other SMEs with an anticipatory strategy. Indeed, SMEs from the same institutional sector often face similar social and environmental issues, and they can act together, reducing costs of action and improving results that a single SME, acting alone, cannot achieve (Grimstad et al., 2020).

Network model is a way to undertake CSR, to care toward sustainability issues, and to address the limitations faced by the SMEs when they try to implement CSR individually (von Høivik & Shankar, 2011). Instead of considering CSR as a business cost, CSR should be regarded as a fundamental value creation driver (von Høivik & Shankar, 2011). The network becomes the pivot of a new value creation process able to achieve network's growth, with innovation and proactivity/external pressure. When SMEs join in a network, the probability to recognize the relevance of sustainability issues and the opportunity of being more socially responsible increase.

Then, the network becomes the place where through collaborations and partnerships, an SME can start developing awareness and a practical approach toward sustainability.

SMEs require external stakeholders to act as substitutes for key internal agents when there is a lack of knowledge regarding sustainability issues or where there is the need to develop innovative product, processes, organizational features, and business models (Breuer & Lüdeke-Freund, 2017; Journeault et al., 2021). In their work, Journeault et al. (2021) clarify that in an SME sustainability-oriented network, the presence of different stakeholders “performing different transversal and complementary roles can represent an effective framework for providing more tailored solutions to the specific needs of different SMEs” (p. 11). In the work of Battaglia et al. (2014), it is interesting to note that the existence of formal CSR-related instruments is used to guarantee that competitiveness and sustainability are tightened together. In this view, the use of formalized tools guarantees business partners about the commitment of SMEs in sustainably performing, and this degree of formalization toward a sustainable business conduct is also present in the FNCs.

Upward and Jones (2016) formulate a formative proposition based on the idea that a strongly sustainable business model creates ecological, social, and economic value and takes its embedding value

network into account within a “system”: Sustainable business model's value creation is composed by resources, capabilities, and inter-organizational networks that rely on the integration among marketing, design, operations, and logistics, as well high information exchange and integration with external organizations (Morioka et al., 2018; Schaltegger et al., 2016). Moreover, the extensive use of collaboration and partnerships is of fundamental importance in order to achieve scalability of projects, to expand to other markets, and to acquire and transfer knowledge, as well as producing positive social and environmental value (Lüdeke-Freund & Dembek, 2017; Norese et al., 2020).

According to Murillo and Lozano (2009) and Grimstad et al. (2020), the presence of a genuine commitment toward sustainability is the only factor driving small entrepreneurs in becoming so effective. No extrinsic and coercive motivations can be considered equally important, but a complex set of factors relying on social networks and relational capital can push SMEs to pursue sustainability aims (Westman et al., 2019). In this term, it seems that the only available alternative would be to find where and when sustainability matches the business models and the value creation process of the company (Bocken et al., 2014). The network approach can be classified under the business model innovation as networks could play a function of tailoring sustainability and helping SMEs to adopt a hands-on guidance in their internally developed projects (Camarinha-Matos et al., 2010; Kundurpi et al., 2021).

Among the studies on business networks oriented toward sustainability issues, several typologies emerge, especially using market and entrepreneurial advantages (Jansson et al., 2015). It is also demonstrated that when a network is dense, the sharing of resources and knowledge is more effective also in the case of SMEs (Alkahtani et al., 2020). The literature recognizes alternatively the presence of, as recently called by Klewitz (2017), sustainability-oriented innovation such as (i) business-to-business new market opportunity networks (Rizzi et al., 2014); (ii) business-to-business and business-to-consumers supply chain (Formentini & Taticchi, 2016; Negri et al., 2021; Silva et al., 2021; Vurro et al., 2009); (iii) eco-innovation product/services/processes network (Biondi et al., 2002; Carfora et al., 2021b; Kanda et al., 2018; Klewitz, 2017; Klewitz & Hansen, 2014; Pacheco et al., 2018); and (iv) shared value through enabling clusters (Porter & Kramer, 2011, 2019).

### 3 | MATERIALS AND METHODS

In this section, authors analyze with a quantitative methodology a sample of FNCs with the aim to confirm results suggested by literature review. The research starts from the analysis of a sample of Italian contractual business networks, that is, a legal formalization of business networks, established in Italy in 2009 and amended in next years. The main purpose of the study is to test the effectiveness of such networks in bringing SMEs closer to sustainability issues through the instrumental use of the FNC (RQ1). In doing so, we will discuss if the highly criticized external regulation (the ones aimed at pushing sustainability issues closer to SMEs through rules and fines) can be

overcome through this self-imposed and totally autonomous commitment (even if normative). Consequently, we will describe how a network of SMEs based on a contract could match a sustainability shared purpose (RQ2) and how this is concretely explained and implemented in the statutory mission of the business network, in its plans and its legal documents (RQ3).

FNCs as innovative landscape for business networking have recently been the focus of attention of different scholars, especially because a wide range of data is now available to researchers since a decade is past from the first introduction of this contractual agreement. Cisi et al. (2020) demonstrated that SMEs find this new contractual way optimal because they can involve in the preexisting developed deal in a way that has a positive effect on performance, on profitability, and on penetration in foreign markets. On the one hand, the pivotal work of Pastore et al. (2020) demonstrates that networks could be advantageous for firms operating in environments that are characterized by intrinsic weaknesses in terms of supporting SMEs to compete, to survive, and to thrive. On the other hand, Tunisini and Marchiori (2020) criticize the effectiveness of this tool in reaching successful performance. Indeed, the authors stress the importance of a strong commitment in terms of will and belief of networks actors.

#### 3.1 | Content analysis and data description

The first step of the present analysis is concerned with a content analysis of contracts based on Corazza et al. (2018). Three sections of the FNC have been coded: the partner list and description, the scope, the purpose of the network (a narrative description), and the planning with the objectives. In details, for each contract, three main characteristics have been defined: the relationship between SMEs and sustainability, the FNC focus, and the sustainability area.

- *Relation between SMEs and sustainability (y)*. The relation between SMEs and the concept of sustainability has been analyzed coding the section of the FNC where the description of the profile for each partner is reported. Especially, the coding has been run on the explicit mention or not mention of having an experience in sustainability in a wider way, including process, product, and markets. This variable (y) is defined by four categories: A value equal to 4 identifies that all firms are in a social/green economy; equal to 3 defines those one or more enterprises are in the social/green economy; equal to 2 when all firms are out of social/green economy; and equal to 1 if it was impossible to determine the relation between enterprise and sustainability. The case of  $y = 1$  is mainly due to the poor quality of the description of the company's profile in the FNC, and it happened mainly in the case of single entrepreneurs, like agricultural entrepreneurs, and other individual entrepreneurs exercising technical professions such as plumbers, carpenters, and construction workers. In our analysis, y represents the dependent variable of the ordered logit with the aim to answer at the first research question (RQ1).

- *The FNC focus* ( $x_1$ ). This variable represents the main purpose of the FNC, and it has been investigated as the application of one of the main reasons to establish a business network contract, as presented in the literature review, applied to sustainability issues/concerns. The main coding has been run on the part of the FNC dedicated to illustrating the main purpose of the contract. According to our reasoning, this variable will help us in investigating RQ2 that is the main extent of the network. This variable can assume four values: 1 if in the FNC is mentioned the increase of market presence; 2 if the resource efficiency is reported; 3 if the focus is on common goods; and 4 if the aim is to build a supply chain B2B.
- *Sustainability area* ( $x_2$ ). The sustainability area is defined as the “how,” equivalent to RQ3, that is about the concrete implementation of sustainability as in the main purposes of the FNC. Also in this case, the variable can assume value 1 if the sustainability area concerns new market opportunity; 2 for new business model customer/user oriented; 3 if firms aim at innovating (i.e., incremental and radical eco-innovation, eco-efficiency, and environmental performance); and 4 in other cases (shared value; social efficiency). The categorization has been drawn from the literature analysis and according to Corazza et al. (2018). The legislation underpinning network contracts does not originally require companies to be sustainability oriented. For this reason, it is interesting to understand the reasons why companies that decide to enter a network contract include sustainability within the contractual agreement. Therefore, the network contracts analyzed already represent a subset of the total, purified on a sustainable purpose. By logic, it is not certain that all companies that decide to bind themselves to a network contract have previous experience related to a sustainability issue. It is therefore interesting to understand that transformational mechanism induced by the network.

In addition, some information on endogenous characteristics of contract have been extracted to enrich the knowledge on the phenomenon observed, such as the geographical macro-area and the industry of firm leader ( $x_3$  and  $x_4$ ). In addition, in order to improve results, each FNC has been weighted with the number of firms involved in the contract ( $w$ ). The firm leader is recognized by the network's members, and it is explicitly identified in the contract. For the geographical macro-area, the ISTAT (Italian National Institute for Statistics) classification has been used identifying for each geographical macro-area a dummy variable (i.e., North-West, North-East, Center, and South and Islands). Concerning the industry, five dummy variables have been added. In details, following the ATECO2007 classification, the sectors represented are agriculture and fishing, retailing, manufacturing, services, and tourism.

### 3.2 | Methodology

The adopted model for testing our research hypothesis is the ordered logistic regression where the dependent variable (i.e.,  $y$ ) presents more

than two categories and the values of each category have a meaningful sequential order. Indeed, the dependent variable ranges from 1 to 4 where by increasing the value, also the number of firms involved in sustainability issues increases. For instance,  $y = 2$  means that all firms in the FNC are out of social/green economy, whereas  $y = 3$  represents FNCs where one or more firms are involved in sustainability (social/green) issues. Considering this, since the dependent variable is categorical and orderable, the ordered logistic regression is the most appropriate model representing our data. The multinomial logit (or probit) considers categorical nominal variables that cannot be ordered, and it is used to predict categorical placement in or the probability of category membership on a dependent variable considering all regressors.

The stereotype logistic regression considers multiple equations in order to capture the effects of latent variables. Even if, as suggested by Liu (2014), the model is a generalization of the ordinal logistic regression, computationally it is expensive, and the correct formalization is not simple, then this approach is underutilized.

For all these reasons, for our specific case, the ordered logistic regression model has been adopted.

This model is based on the cumulative probabilities of the response variable: In particular, the logit of each cumulative probability is assumed to be a linear function of the covariates with regression coefficients constant across response categories (Grilli & Rampichini, 2014). In our case, the dependent variable is represented by the relation between SMEs and sustainability (precontract) and denotes the outcome of the ordered logistic regression model. Indeed, by increasing values of this variable, also the sustainability involvement of firms before the contract increases. Independent variables (i.e.,  $x$ ) of ordered logistic regression are other explained items (i.e., the focus of FNC, the sustainability goals to be reached, the geographical macro-area, industry, and the number of firms in the contract). All variables, except for the number of firms per contract that is continuous, are categorical; then dummy variables for each category have been introduced in the model to evaluate the relation between each specification of the FNC focus and of the area of sustainability to be reached with the involvement of firms in social/green business before the contract (i.e.,  $y$ ).

The analyzed sample used by Corazza et al. (2018) was reduced, for this study to 96 FNCs, selecting the contracts whose information was accurate regarding the data of all the SMEs involved. Summary statistics are presented in Table 1. These statistics suggest that most contracts (71.9%) are formed by firms that at the moment of the signature were not all involved in social/green economy (i.e.,  $y = 2$  and  $y = 3$ ). While the prevalent focus of FNCs seems to be to increase firms' market presence (57.3%), the sustainability area to be reached through the FNC is more distributed among the different items. Considering the size of contracts, the average number of firms per contract is 15, while the largest contract includes 71 firms. The overall number of companies included in this study is equal to 1486. Contracts are uniformly distributed among geographical macro-areas, and the most represented industries are manufacturing and services.<sup>1</sup>

**TABLE 1** Summary statistics on FNCs sampled

Variables	Obs	Mean	Std. dev.	Min	Max
y: Relation between SMEs and sustainability (precontract)					
1: Not predetermined	96	0.208	0.408	0	1
2: All-out of social/green economy	96	0.375	0.487	0	1
3: One or more in the social/green economy	96	0.344	0.477	0	1
4: All-in social/green economy	96	0.073	0.261	0	1
x <sub>1</sub> : FNC focus					
1: Increase of market presence	96	0.573	0.497	0	1
2: Resource efficiency	96	0.219	0.416	0	1
3: Common goods	96	0.146	0.355	0	1
4: Supply chain B2B	96	0.063	0.243	0	1
x <sub>2</sub> : Sustainability area to be reached					
1: New market opportunity	96	0.188	0.392	0	1
2: New business model customer/user oriented	96	0.219	0.416	0	1
3: Eco-innovation/eco-efficiency and environmental performance	96	0.375	0.487	0	1
4: Shared value/Social efficiency	96	0.219	0.416	0	1
x <sub>3</sub> : Geographic macro-area					
1: Center	96	0.198	0.401	0	1
2: North-East	96	0.271	0.447	0	1
3: North-West	96	0.281	0.452	0	1
4: South and Islands	96	0.250	0.435	0	1
x <sub>4</sub> : Industry					
1: Agriculture and fishing	96	0.073	0.261	0	1
2: Retailing	96	0.063	0.243	0	1
3: Manufacturing	96	0.438	0.499	0	1
4: Services	96	0.396	0.492	0	1
5: Tourism	96	0.031	0.175	0	1
w (number of firms)	96	15.479	16.915	2	71

## 4 | RESULTS AND DISCUSSION

Results of the model suggest how independent variables affect the probability of the dependent variable to change of class. However, coefficients of an ordered logistic regression cannot be read as regular ordinary least squares (OLS) coefficients. For this reason, it is necessary to calculate the predict probability through the marginal effects. Complete results of regression are presented in Appendix A (Table A1). The value of the LR ratio confirms that the model is appropriate, and the *pseudo-r*<sup>2</sup> is 0.5877, suggesting that the proposed model design explains the 58.77% of the variability of the dependent variable. Independent variables included in this study are the focus of the contract and the sustainability goals reached through the contract (i.e.,  $x_1$  and  $x_2$ ) and the geographical macro-area and the industry (i.e.,  $x_3$  and  $x_4$ ) of the firm that is contractually indicated as the leader. Finally, the number of firms for each contract (i.e.,  $w$ ) has been considered as variable weight. Remind that variables  $x_3$ ,  $x_2$ ,  $x_3$ , and  $x_4$  are categorical and for each item a

dichotomous regressor has been built, with the aim to catch the effect on the dependent one.

Calculating the marginal effects after the ordered logistic regression allows to predict probability that the dependent variable assumes a specific value, given that the rest of the variables is at their mean values. Marginal effects for our model are presented in Table 2 where each column represents values of the dependent variable. To understand the meaning, let us consider coefficients of Column 1: These represent the probability of  $y$  (i.e., involvement of firms before the contract is not predetermined) given that the rest of the variables is at their mean values. Considering our research hypothesis, the marginal effects have been evaluated after the ordered logistic regression on interactions between the focus of contracts ( $x_1$ ) and the sustainability goals to be reached ( $x_2$ ). Figure 1 represents the adjusted probabilities predicted for the different values of the dependent variable and presented in Table 2. Regarding  $y = 1$ , the highest, and most significant, values of coefficients are obtained when FNCs match criteria of common goods, as this is the case of place-based small agricultural

**TABLE 2** Marginal effects after ordered logistic regression (interaction variables  $x_1$  #  $x_2$ )

Variables	(1) y = 1	(2) y = 2	(3) y = 3	(4) y = 4
Increase of market presence # New market opportunity	0.000* (0.000)	0.006** (-0.0023)	0.516*** (-0.032)	0.478*** (-0.032)
Increase of market presence # New business model customer/user oriented	0.053** (-0.026)	0.830*** (-0.036)	0.116** (-0.058)	0.001 (-0.001)
Increase of market presence # Eco-innovation/Eco-efficiency/Environmental performance	0.118*** (-0.014)	0.829*** (-0.017)	0.053*** (-0.008)	0.000** (0.000)
Increase of market presence # Shared value/Social efficiency	0.000* (0.000)	0.039** (-0.017)	0.847*** (-0.049)	0.114* (-0.059)
Resource efficiency # New market opportunity	0.000 (0.000)	0.002* (-0.001)	0.278*** (-0.045)	0.720*** (-0.045)
Resource efficiency # New business model customer/user oriented	0.020** (-0.010)	0.709*** (-0.096)	0.269*** (-0.103)	0.002 (-0.002)
Resource efficiency # Eco-innovation/Eco-efficiency/Environmental performance	0.045*** (-0.009)	0.819*** (-0.019)	0.135*** (-0.02)	0.001** (0.000)
Resource efficiency # Shared value/Social efficiency	0.000* (0.000)	0.014*** (-0.005)	0.721*** (-0.100)	0.265*** (-0.103)
Common goods # New market opportunity	1.000*** (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
Common goods # New business model customer/user oriented	1.000*** (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
Common goods # Eco-innovation/Eco-efficiency/Environmental performance	1.000*** (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
Common goods # Shared value/Social efficiency	1.000*** (0.000)	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)
Supply chain B2B # New market opportunity	0.000 (0.000)	0.001** (-0.001)	0.198*** (-0.034)	0.801*** (-0.038)
Supply chain B2B # New business model customer/user oriented	0.013* (-0.007)	0.621*** (-0.121)	0.364*** (-0.125)	0.002 (-0.002)
Supply chain B2B # Eco-innovation/Eco-efficiency/Environmental performance	0.030*** (-0.006)	0.774*** (-0.024)	0.195*** (-0.025)	0.001** (-0.001)
Supply chain B2B # shared value/social efficiency	0.000* (0.000)	0.009** (-0.004)	0.631*** (-0.127)	0.360*** (-0.130)
Observations	1486	1486	1486	1486

Note: Standard errors in parentheses.

\* $p < .1$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

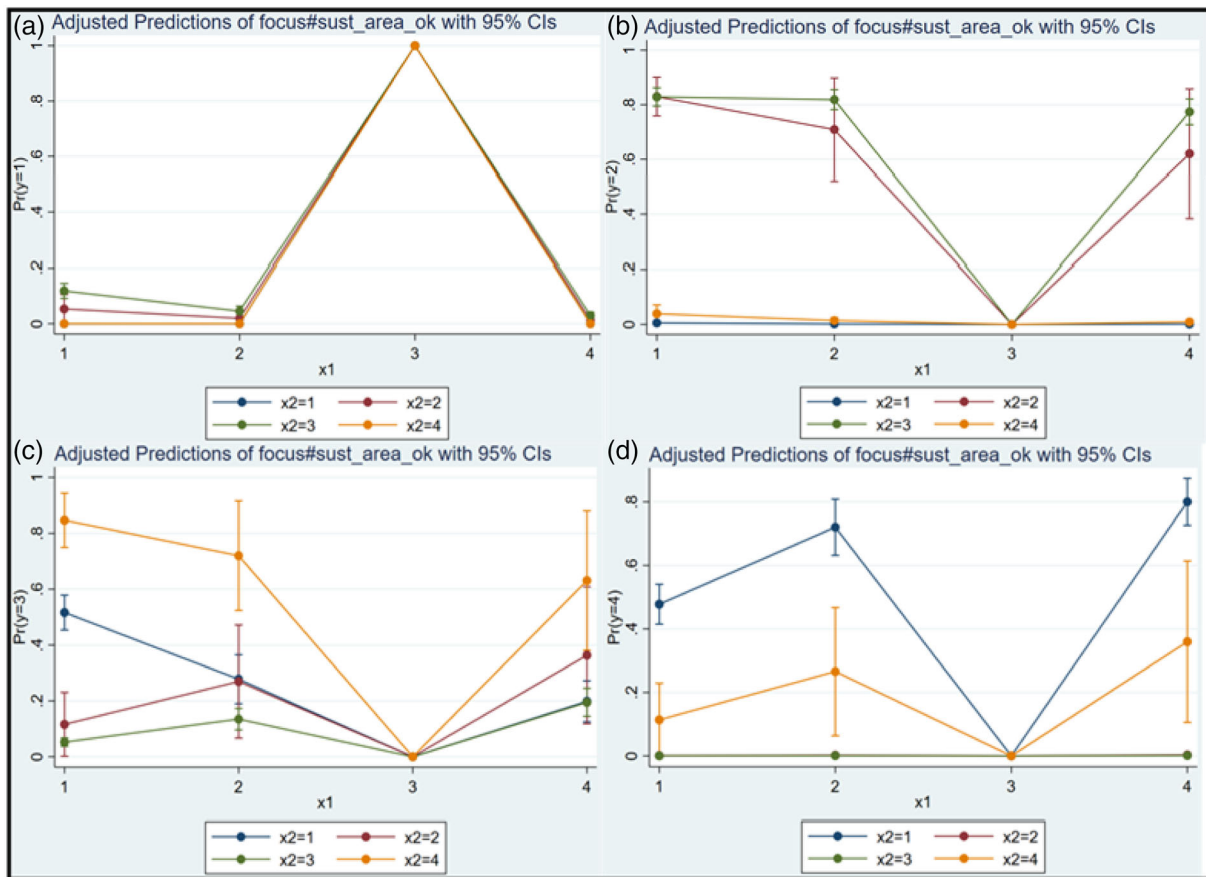
entrepreneurs that establish an FNC to safeguard and care about their specific endemic production (see, for instance, Corazza et al., 2018).

Concerning the research hypothesis RQ1, the second column shows interesting results. Statistically significant coefficients represent the probability that firms that declared to be all-out of social/green economy before entering in the FNC, after the contract, develop an interest toward the sustainability objectives mentioned in the contract. Notice that the sample of FNCs and information about their scope refer to 2017 (dependent variable,  $y$ ), whereas information about the aim of firms involved in the contracts refers to previous years, before their entry in the FNC (independent variable,  $x_i$ ).

From Table 2, the majority of FCNs where the sustainability area to be reached ( $x_2$ ) is improving both the new business model customer/user oriented and eco-innovation (radical or incremental), eco-efficiency, and environmental performance are built up of firms all-out of social/green economy. In details, all coefficients are strongly significant ( $p$ -value  $< .01$ ) for each FNC focus ( $x_1$ ), with the exception of common goods that is the specific case of small agricultural entrepreneurs as explained before. Considering the new business model customer/user oriented ( $x_2$ ) and the increase of market presence ( $x_1$ ), the

probability that the contract is made up of all firms out of social/green economy is 83%, while the probabilities decrease considering both the resource efficiency and the supply chain B2B as FNC focus (70.9% and 62.1%, respectively). Concerning the sustainability as innovation ( $x_2$ , eco-innovation, eco-efficiency, environmental performance) and the increase the market presence ( $x_1$ ), the probability that all firms are not involved in sustainability-green activity is 82.9%, while, also in this case, probabilities decrease, taking into consideration both the resource efficiency and the supply chain B2B as FNC focus (81.9% and 77.4%, respectively).

Figure 1b shows the graphical representation of probabilities for Column 2. The green line indicates that the interaction between the FNC focus on each declination (i.e.,  $x_1$ ) and the eco-innovation/eco-efficiency/environmental performance (i.e.,  $x_2$ ) determine higher probabilities that firms before the contract were all-out of green/social (i.e.,  $y = 2$ ). This result allows us to not reject our hypothesis: FNCs are tools able to overcome sustainability barriers (RQ1). In other words, it can be affirmed that if all the companies were out of the sustainability economy, their first contract is more focused on environmental concerns explained by eco-innovation and eco-efficiency, for



**FIGURE 1** Adjusted predictions for  $y$  (frequency weight = number of firms): 1 (a), 2 (b), 3 (c), 4 (d) [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

reaching market goals, resource efficiency, or supply chain goals, more than driven by social concerns (RQ2).

Regarding RQ3, results of Column 3 are also equally interesting. Indeed, the probabilities that the contract is made up of one or more firms involved in social/green business before the FNC are all highly significant ( $p < .01$ ) when the sustainability area to be reached concerns shared value and/or social efficiency ( $x_2$ ). Considering the interactions with all declinations of the FNC focus ( $x_1$ ), the probabilities are 84.7% for the increasing of market presence aim, 72% for the resource efficiency purpose, and finally 63.1% when the supply chain B2B is the FNC focus (i.e., yellow line in Figure 1c). However, in this specific case, that is to say when one or more firms are involved in social/green business before the FNC, high and significant probability (51.6%) is found considering the interaction between the increase of market presence ( $x_1$ ) and the new market opportunity ( $x_2$ ). This result with previous one obtained considering  $y = 1$  seems suggesting that FNCs are seen as effective tool for increasing the market presence thanks to the shared sustainability purposes.

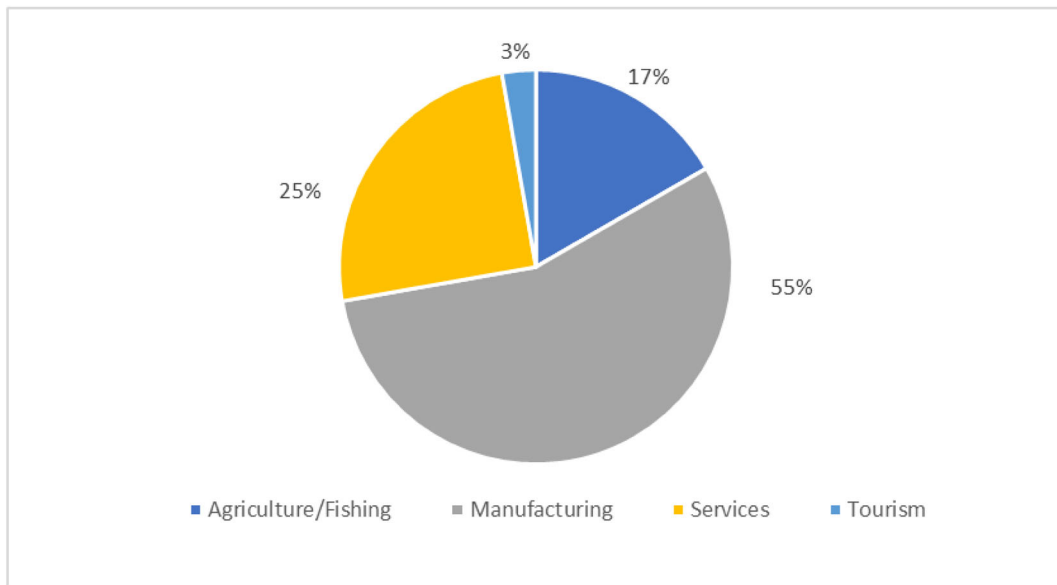
Notice that the obtained results for  $y = 2$  and  $y = 3$  are perfectly in line with suggestions by literature (e.g., Lüdeke-Freund & Dembek, 2017; Norese et al., 2020; Upward & Jones, 2016).

Columns 1 and 4 (Figure 1a,d) are less relevant for our research hypotheses. The dependent variable assumes value equal to 1 when it

was impossible to determine the involvement of firms in sustainability business before the contract. On the contrary, the last column of Table 2 considers firms all in social/green economy before entering in the contract. The probabilities that all firms were somehow involved in green/social economy before entering in a network just to create new business/market opportunity through the three way indicated are statistically highly significant: 47.8% for the increase of market presence, 72% for the reason of resource efficiency, and equal to 80% for a supply chain motivation (i.e., blue line in Figure 1d and Table 2 where  $y = 4$ ).

Results obtained through ordered logistic regression and following marginal effects show that FNC can be extremely useful for overcoming sustainability barriers. From the analyzed sample, even if firms are not involved in green/social business before entering in the contract, they join with the aim to do eco-innovation (radical and/or incremental) and eco-efficiency and to improve environmental performance. The majority of leader firms that in precontract do not have a precedent experience in social/green business and that have chosen to reach innovations and to improve environmental performance are from manufacturing, service, and agriculture/fishing industries (55%, 25%, and 17%, respectively) as shown in Figure 2<sup>2</sup>. In addition, the same leader firms commit in FNC by having a focus on increasing the market presence, resource efficiency, and supply chain B2B.





**FIGURE 2** Industry distribution for firms not in social/green business before the contract and with innovation/environmental objectives ( $y = 2$ ;  $x_2 =$  eco-innovation/eco-efficiency/environmental performance). Note: No firm from retailing industry responds to the query [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

**FIGURE 3** Industry distribution of firms not in social/green business before the contract and with FNC focus in increase market presence, resource efficiency, and supply chain B2B ( $y = 2$ ;  $x_2 =$  increase market presence, resource efficiency, and supply chain B2B). Note: No firm from retailing industry responds to the query [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

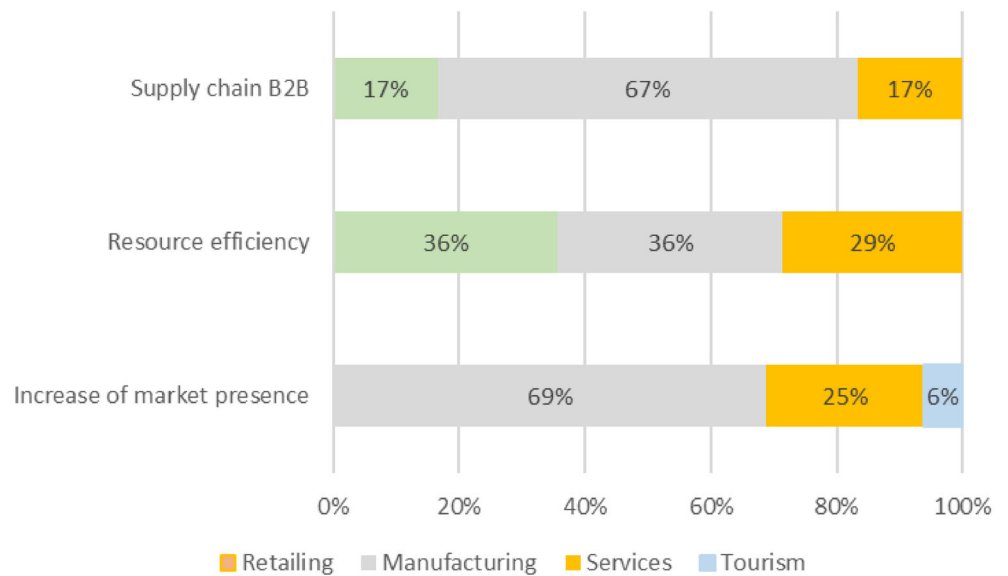


Figure 3 shows, for each FNC focus considered, the industry distribution of the network's leader not involved in sustainability before contract. Manufacturing industry is the most represented for each focus (67% for supply chain B2B, 36% for resource efficiency, and 69% for increase of market presence). However, the strength of FNCs is the heterogeneity of firms, and the idea emerging from the sample and from the analysis is that FNCs can help firms to be more innovative and to take care of the environmental performance.

## 5 | CONCLUSIONS

The study here presented has been designed to test the potential role of corporate networks to enable SMEs approaching sustainability by encompassing their functional barriers. Pointed out as being unsustainable, SMEs declare to be poorly oriented toward the development of sustainability-oriented products and processes or to be unwilling to adopt sustainable business models, as too costly, difficult

to manage and for which they lack the skills and knowledge. Despite this, the literature unequivocally recognizes in corporate networks a useful tool available to SMEs, precisely to put into practice actions and processes, or to pursue objectives of effectiveness, efficiency, increased market presence or even innovation, which would be difficult to pursue if they were acting alone.

In order to do this, in this paper, we have analyzed a sample of contracts of corporate networks named formalized network contract, which refers to a contractual form introduced in Italy in 2009 and which has attracted the attention of researchers as particularly innovative, for its high degree of formalization, while being a completely adaptable tool. Although networks of enterprises and SMEs do not constitute a new object of research, networks of small businesses oriented toward sustainability have an innovative character, especially in the case of quantitative studies, which until now are not numerous (Eweje, 2020).

Through a codification of contractual elements and a classification of these, the study presented here demonstrates how these networks play an enabling role in bringing SMEs closer to the concept of sustainability (RQ1), to its practical implementation on different levels of purpose (RQ2), and to the ways in which the network is oriented toward sustainability (RQ3). According to Melè (2009), the power of the network is therefore also expressed in application to sustainability through a greater propensity to share values, including moral ones, and to exchange information and resources. Specifically 96 contracts are analyzed in this study, for a total of 1486 firms involved.

Some implications emerge from this study. Firstly, sustainability-oriented networks of SMEs can become a public policy tool to encourage companies toward a greater awareness on the theme of sustainability and sustainable development. Secondly, this study contributes to the literature on sustainability in SMEs by providing a new perspective of analysis, including the use of tools that can be adopted by individual entrepreneurs and microenterprises, without incurring large implementation and management costs. Thirdly, this study offers a quantitative perspective to the topic, when instead, as seen in the literature, previous studies have mainly focused on case studies and other qualitative methodologies.

Of interest for further development of this research is the analysis of the impact on business profitability and competitiveness of SMEs within these networks. For example, through the preparation of a panel of data, it would be possible to reconstruct the ex ante and ex post conditions by assessing the presence of possible cause-effect links of FNCs on the economic sustainability. In addition, it would be fundamental to understand the duration of the transition toward sustainability induced by the participation in these network contracts to assess the extent of the transformation effect on the business practices over the long run (e.g., 3 or 5 years after the end of the contract).

Finally, considering the difficulties that SMEs usually declare to have in changing their processes or products by incorporating sustainability issues, the network contracts analyzed here can really become a public policy tool. The legislator might consider revising the

regulatory framework on which network contracts are based to provide for a more formalized orientation toward sustainability. In this way, a legal instrument could help break down the juxtaposition between economic efficiency and sustainability, which is often used as the main barrier by small entrepreneurs, and it could be helpful in supporting the new economic transition toward circularity (Sharma et al., 2021).

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## ENDNOTES

<sup>1</sup> Note that industry and geographical macro-area refer to firm leader.

<sup>2</sup> Retailing firms are part of an FNC for which no information is available ( $y = 1$ ) or where one or more enterprises are in the social/green economy before the contract ( $y = 3$ ).

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**How to cite this article:** Corazza, L., Cisi, M., & Falavigna, G. (2021). The enabling role of formalized corporate networks to drive small and medium-sized enterprises toward sustainability. *Business Strategy and the Environment*, 1–14. <https://doi.org/10.1002/bse.2909>

## APPENDIX A.

**TABLE A1** Ordered logistic regression model (frequency weight = number of firms for contract)

Variables	(1) y
$x_1$ : FNC focus	
2: Resource efficiency	1.035*** (0.169)
3: Common goods	-30.68*** (1.117)
4: Supply chain B2B	1.476*** (0.186)
$x_2$ : Sustainability area to be reached	
2: New business model customer/user oriented	-7.176*** (0.857)
3: Eco-innovation/Eco-efficiency and Environmental performance	-8.039*** (0.483)
4: Shared value/Social efficiency	-1.964*** (0.563)
$x_3$ : Geographical macro-area	
1: Center	0.530*** (0.190)
2: North-East	1.230*** (0.262)
3: North-West	-0.953***
	0.530***
$x_4$ : Industry	
1: Agriculture/Fishing	-3.851*** (0.537)
2: Retailing	2.093*** (0.556)
3: Manufacturing	-2.775*** (0.513)
4: Services	-3.891*** (0.479)
/cut1	-12.64*** (0.811)
/cut2	-7.741*** (0.682)
/cut3	-2.500*** (0.435)
Pseudo- $R^2$	0.5877
Observations	1486

Notes: The variables  $x_1$  (Increase of market presence),  $x_2$  (New market opportunity),  $x_3$  (South and Islands), and  $x_4$  (Tourism industry) have been omitted for collinearity. Robust standard errors in parentheses.

\* $p < .1$ . \*\* $p < .05$ . \*\*\* $p < .01$ .