Consequences of Technology and Social Innovation on Traditional Business Model

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Abstract
The growing presence of new players – beside those belonging to the institutional and third sectors – committed to supporting social and environmental causes through innovative approaches and tools leads to the profile of a for-profit enterprise increasingly committed to the pursuit of social goals. In the paper, the authors focus their attention on the existence of relationships between innovation and a company's social role in order to assess how innovation affects the social conduct of profit-making enterprises and to determine the birth of a new "hybrid" business model. In order to achieve this goal, research was carried out on a sample of 4,000 Italian Small and Medium-sized Enterprises that claim to operate according to a corporate social commitment, in order to investigate the existence of a relationship between innovative behavior and social and business purposes of companies having different Corporate Social Innovation policies. The data were analyzed using the conditional inference tree, a non-parametric class of tree regression model, which overcomes different regression problems involving ordinal and nominal variables. The results achieved make it possible to fill some gaps in the existing literature, to detect a relationship between technological and social commitment in a company and to open a debate on future research developments.

Keywords: Social innovation; Corporate social innovation; Hybrid organization; Innovation catalyst; Social business model; Conditional inference tree

1. Introduction
The population of European Union (EU) is aging, and by 2030 there will be 88 million people over the age of 65. This age group is expected to increase from 17.5% of the population in 2010 to 29.5% in 2060 (European Commission, 2014). There is, therefore, the need to strengthen basic welfare policies, such as mobility systems, remote health services, and all other measures necessary to meet the needs of elderly people (Chávez-Ávila and Monzón-Campos, 2005). At the same time, there is the need to fight social exclusion and to support an independent life, especially for the weakest social groups (Avelino et al., 2019).
Developing new solutions or improving existing ones is providing new opportunities for innovative small businesses, social economy start-ups and Non-Governmental Organizations (NGOs) at local, regional or national level (Paul, 2020). In this regard, the EU uses the term *enterprise* in the context of programmes aimed at social innovation to indicate the following types of activities (Paul, 2020):

- those for whom the social goal is the main reason of business activity, often in the form of a high level of social innovation;
- those whose profits are mainly reinvested to achieve their social goal(s);
- those in which the organization method or ownership system mirrors the corporate mission, as in the case of adoption of participatory principles or when focusing on social justice.

These different forms of businesses are highly context-sensitive, because the nature and work of the so-called welfare state, even in a relatively coherent economic space, such as that of the EU, differ greatly from country to country. In many of these contexts, however, there is a shared commitment toward the definition of welfare models featuring actors other than institutional ones. They often promote social processes – either directly or indirectly – by engaging in adaptive behavior toward their reference contexts, thus showing dynamic and innovative capabilities (Pies et al., 2020; Vrontis et al., 2020).
Italy is currently witnessing an increase in the social commitment of traditional, for-profit enterprises pursuing Corporate Social Innovation (CSI) policies, which go alongside non-profit social enterprises and institutions in order to address environmental issues, climate change, citizenship, declining birth rates, immigration, rising healthcare costs due to an increasingly older population, poverty and social exclusion. On the basis of this scenario, the present work aims to answer the following research question: Is there any relationship between innovative behavior and social goals in those companies that declare to pursue CSI policies? Therefore, this study starts from the motivation to individuate scientifically and catch empirically the hybrid organizational form dedicated to legitimizing the

pursuit of Corporate Social Responsibility (CSR). Eschewing traditional governmental authority, this hybrid organization model derives its moral legitimacy from the values and mission declared by its owners and, in the case of "benefit corporation", the oversight of a third-party evaluator.
Consequently, the present study will focus on the existence of relationships between forms of innovation and the social role of the company in order to define a new business model: that of the hybrid for-profit enterprise (Howaldt and Kopp, 2012; Bauwens et al., 2020). The work will focus in particular on some of the most important differences existing between this new model and that of more traditional organizations, with relation to three specific areas: innovation, business model and organizational features (Haigh and Hoffmann, 2011). In order to do this, the research work is organized as follows: in the first part there is a review of the literature from the managerial and organizational fields; the second part focuses on the research question and logical analysis steps connected to it; while the third part presents the characteristics of the sample of Italian Small and Medium-sized Enterprises (SMEs) chosen, with the relevant results. The final part aims at verifying the logical analysis steps, previously formulated, and at outlining the potential for implementation of the research.

2. The evolution of the social role of the enterprise: Theoretical background

The prevailing literature considers the survival of the company as based on the application of innovation skills and on the translation of ideas into new products, processes and services in order to achieve profitability and competitive advantage (Bessant and Tidd, 2007; Del Giudice et al., 2019). In this regard, Information and Communications Technology (ICT), considered as a macro-container of technological and innovative tools (Peerally et al., 2019), is increasingly affecting economic, social and environmental dynamics, acting as a catalyst for such changes (Hanclova et al., 2015). The widespread diffusion of ICT highlights the existence of an innovation chain aimed at addressing social and sustainability challenges in sectors such as healthcare, energy and transport (Gouvea et al., 2018).
Social entrepreneurs are called upon to renew their entrepreneurial "meta competence", seeking "new balances" starting from the construction of new ecosystems. The first step in creating a social ecosystem is to define the desired impact as well as the steps that will generate this impact. In a context characterized by a strong technological impact, the ecosystems that support the growth and development of innovations are self-produced by the organizations directly involved, through processes that are largely informal and strongly linked to the peculiarities of the contexts. In this complex framework, various actors play an increasingly important role at the local, national and international levels in building innovation ecosystems, especially as regards the ability to bring together internal and external resources dedicated to this purpose. Ecosystemic logics constitute an approach that aligns ecosystem choices with strategic choices in terms of relevance (Berdugo et al., 2020).
The development of an ICT ecosystem, understood as an unbounded system of individuals, organizations, physical resources, social structures and cultural values that generate new venture activities in new technological fields, is of paramount importance for policy-makers and local business communities that operate under public-private partnership agreements. Furthermore, the ability of countries to capitalize on the social, economic and environmental impact of ICT depends on how it is used by individuals, businesses and governments, and on their capabilities in areas such as infrastructure, financial access and skills development (Adner, 2017; Audretsch and Belitski, 2017; Autio et al., 2014; Breznitz and Taylor, 2014; Isenberg, 2016; Mack and Mayer, 2016; Neck et al., 2004; Nylund and Cohen, 2016; Spigel, 2017; Stam, 2015; Roblek et al., 2019).
An ecosystem is enabling social innovation initiatives and social enterprises if it provides them with the possibility, the means, the opportunitiès and the authority to pursue their objectives of social utility, enhancing the innovative capacities that allow access to resources of different types, and encouraging the creation of relationships and technological connections between organizations in order to share knowledge and activitiès, and to cultivate and enrich human capital (Chi et al., 2020).

In this scenario, social innovations are triggered by the interest in improving social well-being, and are supported by ICT in their achievement. The main drivers in the development and application of new ideas to improve the well-being of society as a whole are now of a broadly social rather than of a merely economic and financial nature. In this regard, the Bureau of European Policy Advisors (BEPA) defines Social Innovation *"as new responses to pressing social demands, which affect the process of social interactions. It is aimed at improving human wellbeing. Social innovations as new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations. In other words, they are innovations that are not only good for society but also enhance society's capacity to act.* Innovation *refers to the capacity to create and implement novel ideas which are proven to deliver value.* Social *refers to the kind of value that innovation is expected to deliver: a value that is less concerned with profit and more with issues such as quality of life, solidarity and well-being"* (BEPA, 2010).

From the sociological point of view, Nussbaumer and Moulaert (2007) argue that social innovation should be considered in a broad sense macro or micro, structural or local. It is introduced by entrepreneurial spirit and through solidarity to improve the functioning of an organization or to transform it into a social enterprise with social goals, which it is able to pursue or promote through a more participatory governance system. In the management field, social innovation is understood as an umbrella concept that embraces different innovation-related concepts (new ideas, products, services and models) that simultaneously meet social needs and create new social relationships or collaborations, which can happen in all sectors, public, private and nonprofit (Murray et al., 2010; Gupta et al., 2020; João-Roland and Granados, 2020).

In the present work, the authors argue that the point of arrival in the evolution of a company that also has social goals can be represented by the maximization of the economic profit in order to optimize the social and environmental benefits, through the development of innovative solutions and new forms of business organization and interaction with the reference contexts (Dawson and Daniel, 2010; Rahdari, 2016). There is, therefore, a new scenario where, while business innovation remains rooted in the logic of commercial exchanges and competitive challenges, social innovation usually starts with products and services also aimed at supporting individuals, organizations, communities and society in general (Khan et al., 2018). Of course, it is not possible to consider these two spheres – social and economic – as independent, just as it is not always true that the only companies pursuing social goals are non-profit ones (Groot and Dankbaar, 2014). It is worth stressing, however, how innovations have not always produced real social progress, so much so in fact that there are many cases in which they have produced a negative impact on general social conditions (typical examples are the huge environmental damage caused by companies that do not comply with environmental standards or the innovations produced in the military industry) (Drayton and Budinich, 2010; Tracey and Scott, 2017).

Schumpeter (2000) argued that if innovation is the essence of entrepreneurship, social innovation is naturally associated with those companies that, beside pursuing legitimate financial targets, are also aware of their social role. Technology, particularly in its digital version, has favored the creation of both new forms of bottom-up innovation trends (for example, hackerspaces, fablabs and makerspaces), based on open access (Moore and Westley, 2011; Rayna and Striukova, 2019), community-based design and fabrication workshops (Smith et al, 2017), and hybrid organizations combining the features of for-profit and non-profit entrepreneurship (Battalina and Lee, 2014; Chebbi et al., 2017; Sahasranamam and Nandakumar, 2020).

These trends clearly express how new business models are shaping companies that aim at producing functional value somehow complementary to the creation of social value (Akter et al., 2020; Bhattarai, Kwong and Tasavori, 2019). Beside the widespread trend to adopt CSI policies, it is now possible to see how more and more companies are adopting a *for-benefit* approach, integrating into their corporate mission the aim of having a positive impact on society and the biosphere with that of profitability (André, 2012; Czinkota et al., 2018). Regarding this trend, we can consider CSI as an embodiment of a for-benefit approach, in which innovative procedures, strategies and technologies are not priorities (Dionisio and de Vargas, 2020).

Innovating for the sole purpose of achieving set business objectives does not always lead to positive results for the entire company management. On the other hand, committing resources in order to pursue solely social objectives would mean that companies neglect an indispensable part of their business, namely that of creating benefit (Molloy et al., 2020).
Often the company that is dedicated to social innovation is confused with non-profit realities. However, if it is true that non-profits are, in some cases, promoters of social innovation, the opposite is not necessarily true. The companies that pursue the objective of social innovation are of a profit nature, i.e., they carry on a business activity that generates value and wealth. In these cases, their mission is to create innovative products, services or models capable of meeting social needs and, at the same time, generating economic development (Oeija et al., 2019).
Regarding that, the desire to find new tools and channels to respond to a collective need goes hand in hand with the need to rethink pre-existing business models in order to generate benefit. Social innovation, therefore, becomes an element of rupture in the creation of new economic systems, such as those represented by the circular economy, the sharing economy and, more generally, by the relationship between economic and social actors for the creation of new partnerships and fundraising models and the exchange of benefits (Cipriani et al., 2020). In light of the need to create social value, we could define the business model of the hybrid company as an organizational process that includes the search for new logics and new ways of creating and capturing value for both financial and social stakeholders (Casadesus-Masanell and Zhu, 2013). In this scenario, the role of technologies is aimed at meeting the two *meta-targets* of "socializing" companies:

1. strengthening the orientation to the market-customer and to competitive challenge, by improving performance and reducing competitiveness (Herrera, 2015);
2. making companies become more aware of social and environmental needs in order to plan and implement steady courses of action more oriented toward the creation of both shareholder and social value (Weerawardena, 2021; Kullak, 2021).

Innovative behavior, as found in the research presented here, may be the result of the co-evolution of innovation processes involving material artefacts, socio-economic conditions and organizational and institutional reconfigurations, while simultaneously taking into account the evolution of collective and individual values, moral interpretations, lifestyles, social capital, body activities, emotions and knowledge (Rauschmayer et al., 2015; Chebbi et al., 2017; Avelino et al., 2019). These results, which for a long time have only been the consequence of spot behavior often aimed at gaining a better reputation in the market and therefore a competitive advantage, now justify the existence of a business model aimed at producing economic value, seen as another type of social value (Lumpkin et al., 2013; Lorenzo-Afable et al., 2020). From an epistemological point of view, we can therefore argue that the social entrepreneur produces lasting value not in the context of market exchanges but in the actions that help preserve and sustain the quality of human lives (Auerswald, 2009).
According to this scenario, the phenomenon of hybridization will lead to the creation of companies whose organizational and behavioral models will be based on a mix of missions and values of a financial and social nature (Czinkota et al., 2018; Stott and Tracey, 2018).

3. The organizational vision of the enterprise's social role

Organizational studies analyze the role of innovation in the social enterprise as a phenomenon of institutional building (Kadefors, 1995), as it constitutes a new business model and an alternative to the typical solutions provided by either the third sector or the public one, inasmuch as it is able to respond to problems of a collective nature in an innovative way (Borzaga and Fazzi, 2011). According to Defourny et al. (2001), the social enterprise is something more than a simple organizational evolution of the non-profit sector or the social economy, and it deserves an analysis that goes beyond these two concepts. Given its characteristics, it can represent a valid "third option" beside hierarchy and the market, capable of more quickly meeting new needs coming from citizen groups (Borzaga and Fazzi, 2011). In other words, this new organizational form is placed in a higher position (Martinez, 2010) compared to the market and the institutional enterprise, this way highlighting its hybrid connotation (Huybrechts, 2012).

The academic literature analyzes hybrid organizations from different points of view: there is an entire body of work within institutional literature that focuses on the inclusion of hybrids within multiple areas having in common the achievement of social legitimacy (Borzaga, Depedri and Tortia, 2011; Jay, 2013; Mars and Lounsbury, 2009; Murray, 2010; Powell, 1987; Tracey, Philips and Jarvis, 2010). Another body of work on hybrids focuses, on the one hand, on the creation of social enterprises and on the identification of opportunities for social entrepreneurs (Corner and Ho, 2010; Dacin and Matear, 2010; Mort, Weerawardena and Carnegie, 2003; Murray, 2010), while, on the other hand, on the ability of hybrid organizations to address social issues (Haigh and Hoffman, 2014; Weerawardena et al., 2010; Gras and Mendoza-Abarca, 2014).
Taking up Williamson's (1979) concept of continuum, Alter (2007) has created an ideal line on which to place social enterprises based on their position between the traditional non-profit and for-profit sectors (Figure 1): on the right-hand side, there are for-profit enterprises that create social value but are driven mainly by profit; while, on the left-hand side are non-profit companies that, thanks to their commercial activity, generate economic value in financing social programs, while being driven by a social mission on the part of their stakeholders (Alter, 2007).

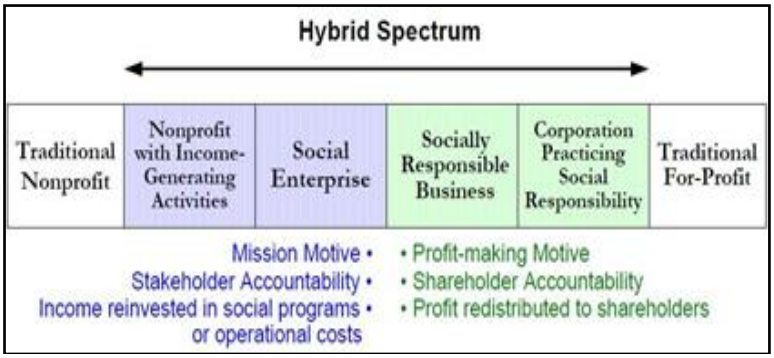

Figure 1. The Hybrid Spectrum
Source: Alter (2007).

In his model, Alter argues that hybrid organizations generate both social and economic value, and the are organized according to their activities, reasons, responsibilities and use of profit (Alter, 2007). Unlike Williamson (1979), Alter (2007) argues that differences between organizations cannot be classified only according to the single dimension of profitability. For this reason, his model aims at representing the blurring of boundaries between for-profit and non-profit organizations by adopting two different parameters of analysis: mission and profit. In line with the research objectives of the present work, the authors argue, therefore, that it is not always possible to sort for-profit companies from social ones (Austin et al., 2006; Gupta et al., 2020). In fact, hybrid organizations tend to bring together approaches pertaining to different and often conflicting fields.
If one looks at co-production processes in these companies, it is quite clear how relational distances between the organization and the reference stakeholding communities are progressively decreasing (Hoffman et al., 2012; Huybrechts et al., 2020; Battilana et al., 2014; Billis 2010; Pache and Santos 2010; Battilana et al., 2012). Therefore, it is a question of devising a new ecology (Hawley, 1986) of development based on interactions and relationships – and supported by ICT – between the subjects that make up the ecosystem. Such relationships will in turn produce open innovation and value (either economic, social, institutional or environmental) based on the company's ability to focus on – and meet – social demands (Van de Vrande et al., 2009; Gentile-Lüdecke, 2020; Paul, 2020). The resulting business model considers the social dimension of corporate activity as a strategic asset, as well as one shaping corporate values, to regenerate different types of resources:

- human, through the development of new knowledge and new skills;
- economic, through the possibility of aggregating many different types of sources due to the hybrid nature of the organization;

- physical, through the process of transforming spaces into places where the ability to establish meaningful relationships with the reference stakeholders becomes a key factor in the success of the whole process.

This is how *economic biodiversity* (Huybrechts et al., 2020) is created. Then, depending on the position along the continuum on which companies move and on the different technological options put in place, such biodiversity, understood as the number, abundance and identity of populations, functional groups and landscape units present in a given ecosystem (Millennium Ecosystem Assessment 2005, Díaz et al. 2006), stimulates business models and organizational forms showing blurred boundaries between them. There will be non-profit companies with a clearly stated social mission and goals, along with for-profit companies aiming at profitability as a key requirement of their own corporate mission (Aversa et al., 2015). The "local" and community dimension of many social enterprises recalls the symbolic-cultural value of organizational forms, whose added value appears to be strongly embedded in the heritage of values, rules and attitudes of the community of people who make it up and who contribute to creating social and economic well-being. Forms are created that are characterized by a principle of organizational "distinctiveness" compared to classical enterprises (Borzaga and Galera, 2012).

Emphasizing biodiversity and adopting a hybrid approach to social entrepreneurship can instead help to avert the foreshadowed risks. In this logic of "sustainability", the organization can demonstrate high social impact by adopting a hybrid value chain model of organizational biodiversity. A strong point of the model is the partnership with local actors (businesses and non-profit associations) that have made it possible to respond to the employment needs of fragile subjects, but also to the demand of businesses for quality services at sustainable costs, ensuring a strong sustainability (Karimi et al., 2020).

Business models can be represented in many ways, and the choice of a particular model over another can affect the associated thought processes and therefore the functionality of the model itself (Martins et al., 2015). However, several recent representations of business models – despite being based on different theoretical assumptions – have all in common the fact of being conceived as combinations of subcategories made of coherent elements (Baden-Fuller and Mangematin, 2013). Based on the mission stated, different forms of innovation (exploration, exploitation, catalyst) can shape different business models: the one that considers the social role of a company is prevalent over the financial one (*Business Growth as Social Lever*, BSGL) (Blundel and Lyon, 2015); the one in which the social purpose supported by commercial activities prevails (*Business Integration*, BI) (Breibarth et al., 2011); the one where the social purposes financed by commercial activities are aimed at meeting specific social and environmental needs (*Business Social Mission*, BSM) (Muñoz and Kimmitt, 2019); or finally, the traditional model in which the innovation of products and services, beside being aimed at overcoming competitive challenges, tends to improve the quality of life of the reference community/ies (*Business Innovation*, BInn) (Ghezzi and Cavallo, 2020). The common factor that can be found in the action of hybrid organizations is therefore the pursuit of sustainability, which constitutes the basis of our research target. It should no longer be seen as a mere reduction of the negative social impact of the activities undertaken, but rather as an attempt to create eco-systemic improvements at the social level through their action (either from service provision or from product sales activities), so as to produce phenomena of an *open social innovation* type (Van de Vrande et al., 2009; Kaiser and Budinich, 2014; Tracey et al., 2011).

Corporate hybridization is not a new phenomenon, but the interest in innovative organizational models that facilitate the achievement of double or triple ends has recently increased as a response to the challenges of global sustainability (Huybrechts et al., 2020). Hybrid organizations, however, face legitimacy challenges, as they are (a) difficult to classify within established organizational taxonomies (Aldrich and Fiol, 1994; Suchman, 1995), and (b) difficult to understand/accept by classical theorists (Meyer and Rowan, 1977; Di Maggio and Powell, 1983; Hannan and Freeman, 1977).

This is the gap the present work seeks to fill, by providing both a scientific and an operational contribution through the definition of a business profile that, on the basis of its stated mission and

innovative behavior, shows the typical features of hybridity. The business model of hybrid organizations (Hoffman et al., 2012) helps to broaden their consensus from economic institutions and the markets in which they operate, by better illustrating and making widespread their operating methods so that other companies can imitate them – as a result of an isomorphic process – in order to eventually improve social well-being (Huybrechts, 2020).

4. The role of technology in the hybrid business model

Do social innovation and hybrid organizations need, or depend on, technological innovation? Hybrid organizations have become increasingly relevant to technology transfer efforts in all those contexts that view technological innovation as an engine for economic development (Cajaiba-Santana, 2014). In the past 20 years, the relationship between the technological and social dimensions has undergone profound changes that can be described according to a three-stage process: (a) subordination of the social sphere to technology; (b) reaction of social innovation and consequent neutrality of the technological sphere; and (c) technology seen as a social tool and a generator of value (Ulhøi, 2005; Anderson et al., 2007; Saebi et al., 2019, Avelino et al., 2019). Due to the dynamics of social open innovation, business models are increasingly affected by cross-fertilization processes between sharing economy and social economy (Chesbrough and Di Minin, 2014).

Such hybridization processes are aimed at producing new social protection schemes for weak social groups (Santoro et al., 2018). In this case, social innovation becomes the driver and technology the enabling tool. The combination of these two dimensions could result in a new business model capable of indicating new development and value creation paths (Simons, 2010).

The combination of *hybrid organizations* and *sustainable innovation* allows one to go beyond the old paradigm of merely technological innovation, typical of the Fordist model, in order to free creativity (Kurniawati, 2020). This highlights the ability of the company to catalyze and stimulate processes of interconnection, reinterpretation and construction of meaning through the creation of a *new product-service*, resulting from the involvement of different and heterogeneous players (institutions, third sector, for-profit companies) (Gouvea et al., 2018). Innovation, in fact, beside its different forms of exploitation and exploration, is also characterized by *catalyst innovation*, the result of a less predictable process of direct and indirect involvement, which sees the company in the role of catalyst and stimulator of contributions offered by the different institutional stakeholders – either for-profit or non-profit – and aimed at achieving social goals (Wang et al., 2015; Westley and Antadze, 2010; Gasparin et al., 2021; Carayannis et al., 2005). In this case, technology goes from being a structured organizational feature to being a dependent variable, an element of mediation in the transition from financial to social, to lead companies toward organizational forms capable of using production processes for social purposes (Gasparin et al., 2021).

5. Gaps in literature and logical analysis steps to answer research question

This work follows an interpretative methodology, as the authors believe that innovation, in its dual social and economic purpose, is a phenomenon so complex that it cannot be properly described through quantitative assessments within a positivist and post-positivist conceptual framework (Kuhn, 1962; Feyerabend, 1975; Popper, 1987). Hybridization phenomena, the subject of our analysis, should be viewed and studied not as simple determinants of social laws but rather as the product of intentionally planned managerial actions, taking into account a series of both internal and contextual variables. In the analysis of social innovation, it is therefore possible to understand how communities and organizations in relation to each other are able to respond to new social needs only through the interpretation of reality. For these reasons, the authors have focused their research on Italian SMEs that have stated to be implementing programs of innovation and of social and environmental sustainability. The notion of sustainability employed in the context of this work is that provided by Brundtland (1987): sustainability grounds the development debate in a global framework, within which a continuous satisfaction of human needs constitutes the ultimate goal.

Therefore, CSI is considered the planned behavior through which the company intends to meet the demands of direct and indirect stakeholders, without compromising the social conditions of future

generations (Dyllick and Hockerts, 2002; Lee et al., 2021). The authors have aimed here at filling a gap in the literature where the issue of if and how companies committed to CSI produce social innovation through innovative behavior goes largely unexamined. While some studies point to the existence of various learning enablers in cross-field partnerships (Arya and Salk, 2006; Murphy et al., 2012), little attention is given to the relationship between innovation and social engagement. Also, since the corporate social model can refer to different types of CSI, academic research can show how different forms of innovation might influence both the nature and processes of a company's social impact. The aim of this work is therefore to analyze any relationships existing between adaptive/innovative behavior taking place in its exploration-exploitation-catalyst forms, and the social impact, as stated by the company, in order to present a hybrid business model where form and purpose converge (Andriopoulos and Lewis, 2009; Vrontis et al, 2018; Annosi et al., 2020). To this end, to answer the research question presented in the first paragraph (is there any relationship between innovative behavior and social goals in those companies that declare to pursue CSI policies?), the authors consider three logical analysis steps:

1. *Verify the existence of any specific innovative behavior that can help in the pursuit of social goals* (Hsu et al., 2019).
2. *Understand whether the implementation of CSI policies and the relevant business and organizational models are in any way affected by innovative behavior of the exploration, exploitation or catalyst innovation types* (Herrera, 2016).
3. *Assess the hybridization level of the organization according to the Alter model scale (2007), on the basis of what is stated by the enterprise in its CSI policy description*.

In order to facilitate a better understanding of the analysis carried out, Table 1 summarizes and connects the theoretical concepts, presented so far, to the survey administered to the companies considered.

Table 1. Literature taxonomy and survey entries

Scientific trigger	Questions	Answers
Type of CSI area	In which areas has your company planned and implemented strategies focused on CSI?	Planning of Sustainable Production Processes (PSPP) Policies as strategies in favor of geographical communities to which they belong (Policies) Eco-innovation in favor of the environment (Eco) Social education (SE)
Relations between Social goals and Innovation activities	Which are the three most 'innovative' activities within your company in a CSI perspective?	Business Growth as Social Lever (BGSL) Business Integration (BI) Business Innovation (BInn) Business Social Mission (BSM) Organization
Effects	Which effects has the presence of innovation processes produced on corporate social responsibility?	Demand (relations) Production Social legitimation effects Supply (relations)
Innovation and Adaptive approach	What is the most widely used adaptive process within the company from an organizational point of view?	Exploration Exploitation Catalyst Innovation
Business model, organization and management of change	CSI targets and goals, business model	Business Current Model (BCM) Impact on relations (Actors) Impact on organizational aspects (Organization) Other
Level of technology	What is the technological level of the company?	High tech High-medium tech Low-medium tech

		Low tech
Social impact	To which geographical community does the company feel it belongs?	Local National International

Source: Authors' elaboration.

6. Research methods

The goal of this research is to empirically verify the theoretical logical analysis steps on the existence of a link between CSI and social performance. Empirical data were collected through a survey aimed at exploring the crucial role of innovation, to better understand the relationship between corporate social innovation and its social impact on a company's value. CSI may in fact contribute to sustainable development and simultaneously increase business competitiveness by boosting innovation. The survey also highlights the role of innovation as a fundamental driver for the implementation of new business ideas into practice and the role of new business models to address social and environmental issues. Firstly, survey data are summarized through contingency tables that show the relationship existing between the dependent variable – called Kind of CSI – and the independent variables (Kateri, 2014). Next, this type of exploratory data analysis is extended by introducing more sophisticated techniques, such as the conditional inference tree, to get a more detailed understanding of the issue being analyzed.

The conditional inference tree (Hothorn et al., 2006) is a non-parametric class of regression trees embedding tree-structured regression models into a well-defined theory of conditional inference procedures. It is applicable to all kinds of regression problems, including nominal, ordinal, numeric, censored as well as multivariate response variables and arbitrary measurement scales of the covariates. Generally speaking, the model is flexible, has a strong scientific basis and it improves the decision tree algorithm for recursive binary splitting. This means that conditional inference trees separate the variable selection from the splitting procedure (Hothorn et al., 2006).

Alternative approaches, such as neural networks or support vector machines, have good predictive capabilities, but do not provide any insight into the underlying problem. On the contrary, the conditional inference tree model has a great capability to generalize and manage data issues (Sardà-Espinosa et al., 2017), and is used as a tool to predict and better understand the problem being analyzed.

Recursive partitioning approaches have a long tradition in the statistical literature, and they facilitate interpretations of how covariates are related to heterogeneity across the entire sample (Quinlan, 1993; White and Liu, 1994). One benefit of this approach is that it can automatically detect nonlinearities and interactions in an exploratory setting.

The majority of recursive partitioning algorithms are special cases of a simple two-stage algorithm, and the most popular implementations of such algorithms are Classification and Regression Trees (CART) (Breiman et al., 1984). A significant development within this framework is model-based (MOB) recursive partitioning (Zeileis et al., 2008). It is a semi-parametric approach that aims to find splits concerning a particular underlying model's parameters. However, we observe a model as the response in each terminal node rather than a single dependent variable only, as in classical tree approaches, such as CART. Hence, applying the MOB algorithm, the splits are determined so that the model parameters are maximally heterogeneous across the terminal nodes.

The conditional inference trees are very similar to MOB in several respects, but they do not have to be based on a formal parametric model. However, the conditional inference tree is based on a general class of permutation tests, which can be combined with parametric scores, but can also be based on completely nonparametric test statistics. While originally introduced for simple decision trees with mean responses in the terminal nodes, the conditional algorithm has also recently been exploited to obtain trees with fitted parametric models in each node (Seibold et al., 2016).

The conditional distribution of statistics measuring the association between responses and covariates is the basis for an unbiased selection among covariates measured at different scales (Strasser and

Weber, 1999). Moreover, multiple test procedures are applied to determine whether no significant association between any of the covariates and the response can be stated and whether the recursion needs to stop. The recursive partitioning procedure should be unbiased, i.e. under the assumption of independence of the response *Y* and the input variables $X_i, i = 1 \ldots, m$, the probability of selecting variable X_k is *1/m* for all $k = 1, \ldots, n$, regardless of the measurement scales or number of missing values (Hothorn et al., 2006).

In the present paper, we focus on regression models describing the conditional distribution of a response variable *Y* given the status of *m* covariates by means of a tree-structured recursive partitioning. The response *Y* from some sample space Y may be multivariate as well. The *m*-dimensional covariate vector $X = (X_1, \ldots X_m)$ is taken from a sample space. Both response variables and covariates may be measured at arbitrary scales. We assume that the conditional distribution $D(Y|X)$ of the response *Y*, given the covariates *X*, depends on a function *f* of the covariates $D(Y|X) = D(Y|X_1, \ldots X_m) = D(Y|f(X_1, \ldots X_m))$.

It is interesting to test the null hypothesis of independence of *Y* and *X*

$H_0 = D(Y|X) = D(Y)$

against arbitrary alternatives.

As a rule, a generic algorithm implements a recursive binary partitioning according to the following three steps: (1) select the variables; (2) choose the splitting methodology; and (3) recursively apply the first two steps. Thus, we stop when the global null hypothesis of independence between the response and any of the *m* covariates cannot be rejected at a pre-specified nominal level α. The algorithm induces a partition of the covariate space. The resulting tree models are easier to communicate to practitioners, so conditional inference trees are better than the standard recursive partition procedures implemented in classification and regression trees (CART), also because they avoid any overfitting problems.

All applications of the conditional inference tree model performed in the next section are made using R packages from partykit and CARET.

7. Data and variables

The dataset used in this paper was generated through a survey carried out on Italian manufacturing SMEs by Union of Italian Chambers of Commerce (Unioncamere) and Universitas Mercatorum in 2018. Unit records were extracted from the CERVED-Infocamere official archive (the archive of Italian Chambers of Commerce) by considering companies with less than 250 employees, stratified according to manufacturing sectors and company size, with a total of 4,000 sampled companies. In particular, the survey refers to the time period in which economic activity gradually recovered after the 2008 financial crisis, whose effects lasted until 2014.

Structured questionnaires were posted through the CATI system to all companies (about 4,000 of them, including service companies), obtaining 3,300 replies in return (a response rate of 82.5%). The reference period is 2015-2018. We only analyzed manufacturing firms (2,860 overall). The questionnaire submitted comprised an introductory section containing some information about the companies (economic activity, number of employees, revenues, etc.) and two more sections devoted to the innovation processes applied and the link between corporate social responsibility and social performance of the companies. Surveys often included tick-box questions where respondents are asked to select one (or potentially more) from a fixed number of possible options, resulting in what are referred to in statistics as categorical data. These types of questions are often preferred to open-ended free-text questions, as they are generally easier to analyze and, since they are quicker to fill in, can result in higher response rates.

The variables used in the study are described in Table 2. They have been derived directly from the survey.

Table 2 - Variables used in the conditional inference tree model

Variable name	Categories
Kind of CSI	a. Eco (Eco-innovation) b. Policies c. PSPP (Planning of Sustainable Production Processes d. SE (Social Education)
Innovation activities	a. BGSL (Business Growth as Social Lever) b. BI (Business Integration) c. BInn (Business Innovation) d. BSM (Business Social Mission) e. Organization
Effects	a. Demand b. Production c. Social legitimation effects d. Supply
Adaptative behavior	a. Exploration b. Exploitation c. Catalyst Innovation
Business change model	a. CBM (Current Business Model) b. Actors c. Organization d. Other
Technology	a. High tech b. High-medium tech c. Low-medium tech d. Low
Geographical community	a. Local b. National c. International

Source: Authors' elaboration.

8. Descriptive analysis

Tables 3 to 8 show the relations between the dependent variable Kind of CSI and the categorical variables, namely categorical data that can also be summarized using a contingency table (Agresti, 2013). The aim is to identify whether there are any discernible relationships between the different categories (Kateri and Balakrishnan, 2008).

Table 3. Relationships between Innovation activities and Kind of CSI (values in %).

Innovation activities	Kind of CSI				
	Eco	Policies	PSSP	SE	Total
BSGL	13.7	6.5	10.5	5.3	36,0
BI	0.0	0.0	0.0	5.8	5.8
BInn	8.0	12.2	7.2	0.0	27.4
BSM	0.7	8.7	1.8	13.9	25.1
Organization	2.2	2.0	1.6	0.0	5.8
Total	24.5	29.4	21.2	25.0	**100.0**

Table 4. Relationships between Effects and Kind of CSI (values in %).

Effects	Kind of CSI				
	Eco	Policies	PSSP	SE	Total
Demand	0.8	1.3	3.1	0.0	5.2
Production	18.7	7.0	0.0	0.0	25.7
Social_legitimation_effects	1.8	16.2	4.9	25.0	47.9
Supply	3.2	4.9	13.2	0.0	21.3
Total	24.5	29.4	21.2	25.0	**100.0**

Table 5. Relationships between Adaptive behavior and Kind of CSI (values in %).

Adaptative behaviour	Kind of CSI				
	Eco	Policies	PSSP	SE	Total
Exploration	19.9	11.4	16.0	10.0	57.3
Exploitation	2.9	2.8	2.1	1.7	9.5
Catalyst Innovation	1.7	15.3	3.0	13.3	33.3
Total	24.5	29.4	21.2	25.0	**100.0**

Table 6. Relationships between Business model change and Kind of CSI (values in %).

Business model change	Kind of CSI				
	Eco	Policies	PSSP	SE	Total
Current Business Model (CBM)	13.7	6.5	10.5	5.4	36,1
Actors	6.2	4.9	5.5	4.6	21,2
Organization	2.8	2.7	2.2	1.8	9,5
Other	1.7	15.3	3.0	13.3	33,3
Total	24.5	29.4	21.2	25.0	**100.0**

Table 7. Relationships between Technology and Kind of CSI (values in %).

Technology	Kind of CSI				
	Eco	Policies	PSSP	SE	Total
High tech	2.0	2.0	1.5	2.0	7.5
Medium high tech	3.2	3.6	2.6	2.9	12.3
Medium low tech	7.6	9.7	7.1	8.5	32.9
Low tech	11.7	14.1	10.0	11.6	47,4
Total	24.5	29.4	21.2	25.0	**100.0**

Table 8. Relationships between Geographical community and Kind of CSI (values in %).

Geographical community	Kind of CSI				
	Eco	Policies	PSSP	SE	Total
Local	12.0	29.4	10.7	0.0	52.1
National	7.8	0.0	6.3	16.2	30.3
International	4.8	0.0	4.0	8.7	17.5
Total	24.5	29.4	21.2	25	**100.0**

Source: Authors' elaboration.

Analyzing the row and column marginal frequencies, we observe that Policies is the prevailing modality (29.4%) of the variable Kind of CSI. Among the activities considered most innovative (Table 3), companies include Business Growth as Social Lever (36.0%), Business Innovation (27.4%) and Business Social Mission (25.1%). In contrast, the effects generated by innovation processes in terms of CSI (Table 4) are observed mainly in the modality defined as Social Legitimation Effects (47.9%). Besides, many innovative firms have changed their way to look for new ideas, by adopting open search strategies that involve the use of a wide range of external players and sources, which help them achieve and sustain innovation (Table 5). This may be based on the development of new capabilities, i.e. innovation through Exploration (57.3%), on the employment of capabilities already known, namely innovation through Exploitation (9.5%), or on a new approach defined as Catalyst Innovation (33.3%). Innovation catalysts are employees who understand the value of innovation processes and are able to integrate them well in the organization to address business issues. Instead of being responsible for generating new ideas and stewarding innovation on their own, they play a facilitative role in that they are helping everyone within the organization to achieve this goal. As to CSI goals (Table 6), the companies surveyed tend not to change their current business model (36.1%) or improve their relationships with the other actors. About 10% of the companies state a positive impact on the organizational structure. The companies interviewed tend not to use high-end technology, as only about 20% of them do that (Table 7). More than 50% of companies have the local geographic community where they are based as their main social target (Table 8).

8.1 Statistical tests

Firstly, we separated data into training and testing sets, as most data were used for training, while only a smaller portion of them was used for testing. If we evaluated the model on the same data used to train it, the model might result in being overfit. A model should be judged on its ability to predict new, unseen data. We allocated 67% of the data to the training set. Moreover, a confusion matrix was employed to assess the accuracy of the predictive models built. Thus, the model predicts one response value for each observation in the testing set, and each predicted response value was compared to the actual response value for that observation. The confusion matrix and the statistics regarding the results and the test set are shown in the following tables (Tables 9–11). Global accuracy is nearly 80%.

Table 9. Confusion matrix

Prediction	Eco	Policies	PSSP	SE
Eco	182	46	43	3
Policies	46	160	61	0
PSPP	0	18	165	5
SE	0	0	0	213

Table 10. Overall Statistics

Accuracy	0.7892
95% CI	(0.7412, 0.8153)
No Information Rate	0.2969
P-Value [Acc > NIR]	2.2e-16
Kappa	0.7203

Table 11. Statistics by Class

Class:	Eco Class	Policies Class	PSSP Class	SE Class
Sensitivity	0.7937	0.8280	0.6134	0.9638
Specificity	0.9107	0.8499	0.9639	1.0000
Pos Pred Value	0.7565	0.5993	0.8777	1.0000
Neg Pred Value	0.9311	0.9484	0.8552	0.9885
Prevalence	0.2461	0.2130	0.2969	0.2439
Detection Rate	0.1954	0.1766	0.1821	0.2351
Detection Prevalence	0.2627	0.2947	0.2075	0.2351
Balanced Accuracy	0.8522	0.8395	0.7886	0.9812

Source: Authors' elaboration.

In Table 12, we display the variable importance measures (Breiman, 2001). Let $\overline{\mathfrak{B}}^{(t)}$ out-of-bag sample for a tree *t*, with t ∈ {1,..., *ntree*}. Then, the variable importance of variable X_j in tree *t* is

$$VI^{(t)}(X_j) = \frac{\sum_{i\epsilon\overline{\mathfrak{B}}^{(t)}} I\left(y_i = \hat{y}_i^{(t)}\right)}{\left|\overline{\mathfrak{B}}^{(t)}\right|} - \frac{\sum_{i\epsilon\overline{\mathfrak{B}}^{(t)}} I\left(y_i = \hat{y}_{i,\pi_j}^{(t)}\right)}{\left|\overline{\mathfrak{B}}^{(t)}\right|},$$

where $\hat{y}_i^{(t)} = f^{(t)}(x_i)$ is the predicted class for observation *i* before, and $\hat{y}_{i,\pi_i}^{(t)} = f^{(t)}\left(x_{i,\pi_j}\right)$ is the predicted class for observation *i* after permuting its value of variable X_j. The raw variable importance score for each variable is then computed as the mean importance over all trees by the following equation:

$$VI(X_j) = \frac{\sum_{i=1}^{ntree} VI^{(t)}(x_j)}{ntree}$$

In standard implementations, an additional scaled version of the permutation importance, called z-score, which is achieved by dividing the raw importance by its standard error, is given. Notwithstanding, different studies indicate that the raw importance $VI(X_j)$ has better statistical properties, so the unscaled version is preferred (Strobl et al., 2008).

Table 12 - Conditional inference tree - Variable importance

Variable name	Variable importance
Geographical community	3.642288924
Innovation activities	2.543612505
Effects	2.344051346
Adaptative behavior	0.072799100
Business change model	0.007825760

Technology	0.006456868

Source: Authors' elaboration.

8.2 Conditional inference trees results

In the following tree (Figure 2), we show that each node is described by a circle, with the splitting variable and its associated *p*-value. The *p*-value denotes the actual significance level at which the split has taken place. The terminal nodes, also called leaves, correspond to a barplot of the output label distribution considering only the observations at each respective leaf, and indicate with *n* the number of observations assigned to that leaf. In addition, the model highlights the nodes that carry more criticalities. For instance, the analysis of nodes 5 and 9 shows that the class distribution of the observations falling under those leaves is more balanced, meaning that the boundaries between classes are not well defined. The same situation is observed for nodes 8 and 27, also compared to the number of companies. On the contrary, the analysis of nodes 6, 11, 21 and 24 shows a large number of observations for the same class and very few from other classes, which means the cases are completely distinguishable by the given splits. On the other hand, if one considers both the number of units of each cluster and the meaning of different modalities of the Kind of CSI variable, the clusters corresponding to nodes 13, 14, 19, 20 and 22 should also be evaluated.

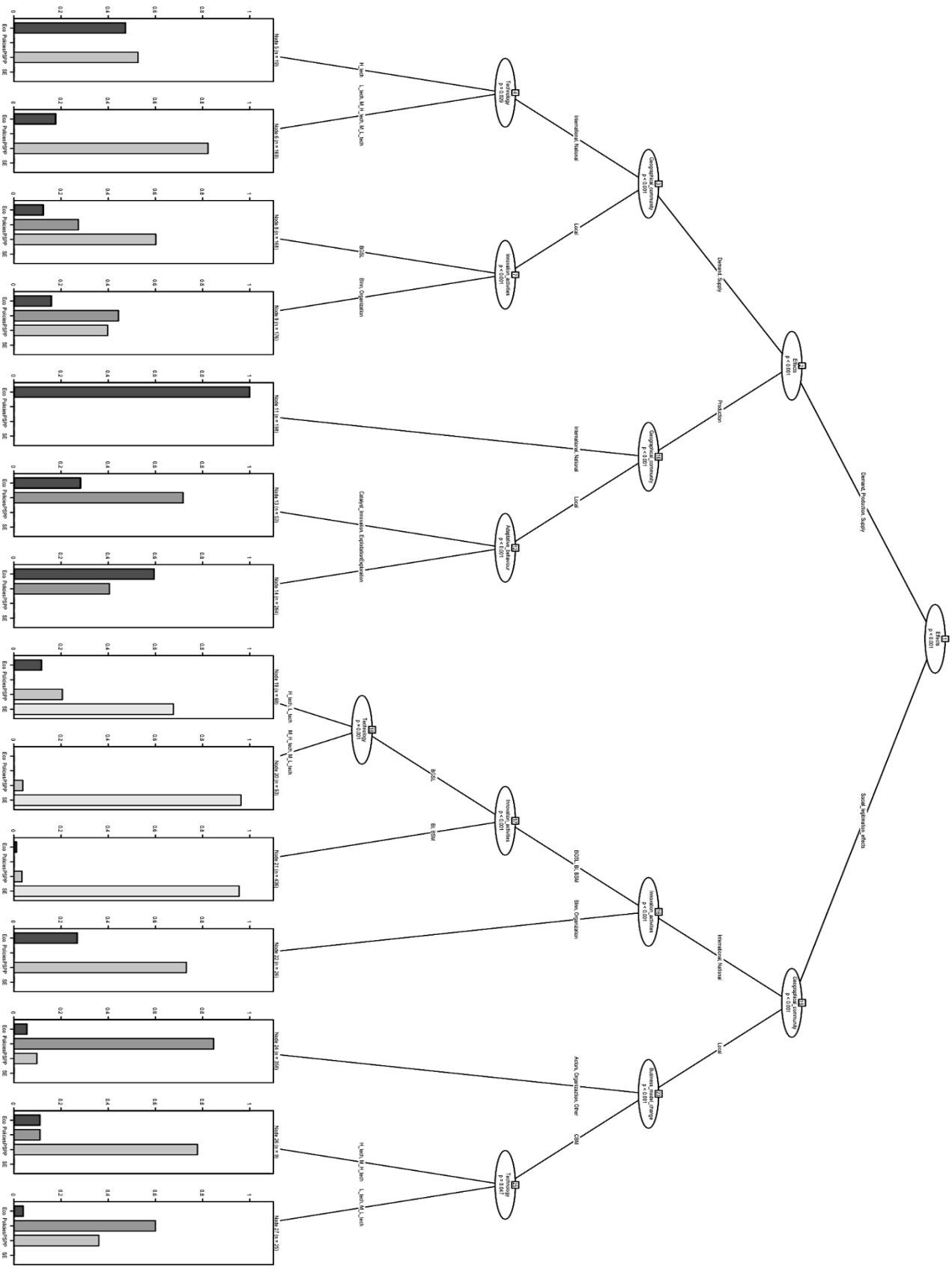

Figure 2. Conditional inference tree

Source: Authors' elaboration.

At the top of the tree, the categorical Effects variable is divided into two different branches. Our analysis follows the left branch, where there are the following categories of the Effects variable: demand, production and supply. One level below, the Effects variable splits into two different tree branches: on the left the demand and supply modalities, on the right the production modality. Both paths flow into the Geographical Community variable, identified by nodes 3 and 10. Node 3 splits into two different branches, indicating the categories of the Geographical Community variable. On the left, the International and National modalities converge to node 4, identified by the Technology variable; on the right, the Local modality converges to node 7, indicating the Innovation Activities variable. Finally, the tree path ends at nodes 5, 6, 8 and 9. For our analysis, the only node we are interested in is node 6, where the selected modalities of the Technology variable are mainly Medium and Low Tech. If one looks at node 6, that is, at the cluster for the dependent Kind of CSI variable, it is possible to see that the cluster is mainly identified by the Planning of Sustainable Production Processes (PSPP) modality. *The tree path validates the second logical step*.
On the other hand, node 10, that of the Geographical Community variable, splits into two paths: the one related to the National and International modalities ends at the final node 11; while the other, that of the Local modality, converges at node 12, identified by the Adaptive Behavior variable. Node 12 splits into two paths: the first one, related to the Catalyst Innovation and Exploitation modalities, ends in node 13; the second one, related to the Exploration modality, ends in node 14. Hence, *node 13 and 14 confirm the second logical step, while node 11 corroborates the first logical step.*
Similarly, if one observes the path to the right of the Effects variable, it is possible to see the Social Legitimation Effects modality joining node 15, identified by the Geographical Community variable. Node 15 splits into two different branches: on the left, the International and National modalities end in node 16, while on the right the Local modality converges to node 23. Node 16, identified by the variable Innovation Activities splits into two distinct paths: the first one, related to the Business Growth as Social Lever (BSGL), Business Integration (BI) and Business Social Mission (BSM) modalities, meets node 17, again identified by the Innovation Activities variable; the second one, identified by the Business Innovation (BInn) and Organization categories, ends in the final node 22. Node 17 also splits into two new paths: the first one joins, through the Business Growth as Social Lever (BSGL) modality, node 18, related in turn to the Technology variable; the second one, on the other hand, converges to the final node 21 by going through the Business Integration (BI) and Business Social Mission (BSM) categories. Node 18 also splits into two trails, ending into nodes 19 and 20 respectively. If one observes nodes 19, 20 and 21, the prevailing modality of the Kind of CSI variable is Social Education (SE). On the other hand, if one looks at node 22, the cluster is substantially described by the Planning of Sustainable Production Processes (PSPP) modality.
Finally, it is possible to observe the paths starting from node 23 and identified by the Business Change Model variable. On the left, the final path is identified by the Actors, Organization and Other modalities. The trail ends at the final node 24, mainly related to the Policies modality of the Kind of CSI variable. On the right, on the other hand, the Current Business Model (CBM) modality converges to node 25, identified by the Technology variable. The last two paths end respectively at nodes 26 and 27. Therefore, *the clusters identified by nodes 19, 20, 21, 22 and 24 validate the third logical step.*

9. Findings

Below is the descriptive analysis of the data presented in Tables 3 to 8 and in the conditional inference tree to test the three logical analysis steps previously outlined.

9.1 Verify the existence of any specific innovative behavior that can help in the pursuit of social goals

The empirical study has highlighted the existence of companies that state their social commitment and adapt their behavior by directly investing in new resources (exploration) and in innovations (catalyst) deriving from open innovation processes. It is worth mentioning here how the adoption of these two different modalities has different effects: in the “exploration” case, the innovations have

mainly an impact on environmental protection (nodes 13 and 14, *eco* and *policies* clusters, Figure 2), while "catalyst2 innovations are aimed at social targets. This latter aspect is linked to the results presented in Table 8, which show the commitment of businesses in favor of local communities and their strong territorial roots – typical features of SMEs.
It is also interesting to observe the results presented in Table 3, where companies declare that the purpose of the social commitment is to achieve "social legitimacy" from the reference community, in line with the conclusions reached by the institutionalist stream of organizational studies (Di Maggio, Powell, 1983; Ramani et al., 2017; Czinkota et al., 2018).

9.2 Understand whether the implementation of CSI policies and the relevant business and organizational models are in any way affected by innovative behavior of the exploration, exploitation or catalyst innovation types

The results are supported by the study on *business change model* (Table 6), which refers to SMEs that, despite investments in new 'exploration' resources (57.3%), do not tend to change business models (36.1%), or instead show dynamism in terms of relationships established with other actors (21.2%), which is typical of organizations that express behavioral change as a result of social open innovation and therefore innovation of the 'catalyst' type (33.3%) (Table 4). Firms declare that investments in innovative activities (Table 1) are made according to the perception of their social role (BSGL) in 36% of cases, or to achieve innovation for profit (BInn) in 27% of cases. These results corroborate what is argued by the prevailing literature, namely that SMEs that practice social innovation tend to create a specific business model by modulating the two different sets of targets: on the one hand, business performance and, on the other, social, cultural and environmental goals (Aversa et al., 2015; Foss and Saebi, 2017; Lubberink et al., 2018; Gasparin et al., 2021).

9.3 Assess the level of hybridization of the company according to the Alter model scale, on the basis of what is stated by the company in its CSI policy description

The acquisition of new resources (exploration) and co-produced innovations, as a result of the catalyst role played within an eco-system made of different actors, shows a prevalence of those innovations in which the technology content is either low or just average (Table 7). This finding corroborates the conclusions reached by the prevailing scientific literature on social innovation, which argues that this phenomenon does not require major technological investments (De Silva et al., 2020). Organizations with a medium-low technological vocation (Table 7) show a propensity for social innovation at almost 60%, which – combined with the findings regarding innovative behavior (Table 6) – confirms the existence of a business model where the activities carried out are mainly of the exploration and catalyst types. It is also worth mentioning how most companies state that their main social commitment is to contribute toward the constant training of their staff, as shown in nodes 20 and 21 of the inference tree (Figure 2).
This scenario clearly shows how the hybrid business model is one of *driven sustainability*, because, instead of focusing only on reducing the negative social and environmental impact of business activities, it actively seeks to produce social and environmental improvements given the links companies have with the reference local community, while at the same time promoting new social practices and new products (nodes 22 and 24, Figure 2). This model deviates from standard notions of sustainability, as it seems to ignore the old-school compromise between economic, environmental and social systems. Companies can be rather seen here as positive deviants, showing generative and mutually enriching connections between them and the communities and natural environments where they operate (Haigh and Hoffman, 2011; Alberti and Varon Garrido, 2017; Pies et al., 2020).

10. Conclusions

The present work is the result of a reflection on sociality, with its relevant managerial and organizational implications. An initial analysis of the data gathered confirms that social innovation can be either caused by changing social models or by a change in organizational models (Tracey and Stott, 2017). This means that the managerial and organizational aspects of social innovation can

follow two different perspectives. According to the first one, there is a group of SMEs that does indeed state having CSI policies in place, but only as a response to a system whose players act to pursue profit according to a mainly competitive approach. In the second one, social innovation starts within the company (from its polices) with the aim of building processes, tools and methods to stimulate and activate *social business integration* paths. The analysis carried out highlights the transition from governance regulation models, characterized by a hierarchical and bureaucratic structure, towards business models in which a group of actors (stakeholders) negotiate in order to make choices, and the hybrid company can play the role of catalyst. According to Alter's continuum (2007), the new business forms, thus created, are not identifiable by the percentage of sociality they state having in their corporate mission, but are rather models with their own characteristics – a natural evolution toward hybrid organizational forms.

The results seem to indicate that trying to sort social from more traditional entrepreneurs is quite pointless if not outright impossible, because the two categories overlap considerably. We think it is far more useful to acknowledge instead that every business has a financial as well as a social bottom line, and that, in most cases, the financial result drives the social one. In the same way, we can argue that social innovations and business innovations show considerable overlaps. For this reason, it is more useful to consider "social" and "business" as different and yet coexisting dimensions of all innovations. Some innovations may score low on social and high on business or the other way around, and many may score high on both, but any effort to draw a line between the two seems indeed arbitrary. Our analysis shows that the element that characterizes these companies is not the coexistence within them of a for-profit and a non-profit soul, which is something that classical business theories have already pointed out. It is instead the fact that the pursuit of social activities and/or the realization of social aims are inserted *institutionally* in a model of a lucrative business. This raises the social vocation to the status of distinctive element within the corporate mission related to a profit-oriented entrepreneurial path. It also configures a new small and medium-sized social-hybrid model, with low to medium technological content, with the presence of innovative behavior of an exploration nature operating according to a general, multi-stakeholder logic (social open innovation context).

10.1 Directions for future research

In terms of future research, a further challenge may be to understand whether these new organizational hybrids are characterized by the presence of *locked-in capital*, that is capital constrained within them to be maximized for the exclusive use of the hybrid activities to be implemented, and used with the aim of increasing the effectiveness of the entrepreneurial project. These are business models whose peculiarity lies in the fact that their assets are unavailable to shareholders, but are paramount to the reference community and to the pursuit of the corporate mission.

Hybrid business models arise in fact from so-called *disruptive* innovation processes, that is from the introduction of rupture elements by promoters of new business projects. It is precisely sustainable innovation that fully embraces the new entrepreneurial project and that aims at breaking up with traditional schemes in order to implement innovative practices of social entrepreneurship, which in turn lead to the creation of so-called second generation hybrids.

Given the complexity and amount of data of the survey presented here, it is possible to say that the conditional inference tree has proved to be a statistically robust algorithm when dealing with categorical variables, capable of adequately handling missing values and of keeping its results unaltered even in the presence of redundant or irrelevant data. The analysis of categorical survey data can in fact be difficult in the presence of non-normality issues, and multivariate methods relying on parametric statistics are less robust in their results compared to those adopting non-parametric ones. Conditional inference trees were introduced to overcome that problem. These algorithms represent a non-parametric class of decision trees and are also known to be an unbiased recursive partitioning of dependent variables based on the value of correlations. Conditional inference trees use a significance test based on permutation that selects the covariate to split and recourses the variable in order to calculate the resulting *p*-value. The multiple significance tests performed at each start of the algorithm

are permutation tests, which are used to obtain the distribution of test statistics under the null hypothesis.
The idea of this research is to build a model that privileges a "bottom-up" dimension and that defines the space for action of all actors in the different phases of the processes, creating new forms of interaction and dialogue, seeking a balance between the market economy and the civil economy. Resilient communities are created and made sustainable, generating and growing social innovation in the territories.
The real challenge of this hybrid model is "doing business" to achieve the general interest in a plurality of new sectors, while encouraging the "intersection" between the social and new areas of our economy, creating the conditions for a new generation of supply chains and networks that are rethought on a community and collaborative basis. This is the prospect of social housing, social agriculture and cultural welfare, i.e. new markets in which a new paying demand is growing, increasingly driven by "voting with one's wallet", i.e. expressing a preference for those "goods" capable of upgrading the environmental and social wellbeing of the community in which one lives. These are new "economies of place", which can become an antidote to the extractive economy, which collects value "in situ" and then distributes it "outside".
It is a new multi-stakeholdership that requires experimentation but favors new partnership logics on challenges, such as those linked to social housing, the management and regeneration of common goods, community welfare and the birth of productive chains capable of creating new employment opportunities for young people and disadvantaged subjects. The objective in this case is to make available to new generations an entrepreneurial device that was created to produce a social and economic dividend: the reformed social enterprise proposes itself as a driver that, without renouncing technological innovation, proposes to produce value first and foremost by generating employment.
Others research directions could address how technology and social innovation could help companies in the international market, also in developing countries (Paul and Sánchez-Morcilio, 2019; Paul and Mas, 2020).

10.2 Limitations of the study

The limitations affecting the present study refer to some methodological rather than operational aspects. First of all, the exclusive focus on SMEs certainly represents well the Italian economic fabric (about 80% of which is made up of SMEs), but the same cannot be said, of course, of other countries. In order to make the model and its results applicable to other geographical contexts, the research should be extended by including, in the sample, considered companies with different dimensional and structural characteristics and by carrying out the survey in other countries. From a methodological and statistical point of view, future studies should analyze corporate behavior also in relation to territorial variables (local, national and international) in order to highlight the different approaches adopted by local and global companies. Also, the present study did not assess the actual impact of corporate choices on the reference contexts, either local, national or international. It would therefore be interesting to analyze in future the effects of social commitments in for-profit companies by adopting a bottom-up approach, starting from the relevant reference contexts.

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