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The interplay among entrepreneur, employees, and firm level factors in explaining SMEs openness: A qualitative micro-foundational approach

This paper seeks to investigate the micro-foundations of engaging in open innovation (OI) in the context of small and medium enterprises (SMEs). More specifically, the study aims to understand the characteristics of entrepreneurs managing small companies and whether these influence the proclivity towards openness. A theory building approach is applied with an exploratory multiple case-study analysis consisting of eight Italian SMEs operating in knowledge intensive sectors. The information gathered through interviews indicate that several factors and variables related to the entrepreneur, employees and firm level have an impact on the propensity towards engaging in OI. Regarding the entrepreneur, delegation, trust in internal and external partners, individual ties and risk taking approach increase the approach towards OI. Moreover, it has emerged that several factors regarding employees contribute to establishing OI strategies. The interviews have also underlined that entrepreneur level factors have an impact on employee level factors in the sense that their joint effect leads to increased openness. These factors are also influenced by firm level factors. In terms of implications, this is one of the first studies on the micro-foundations of OI and, to the best of our knowledge, the first taking the entrepreneur perspective.

Keywords: open innovation; entrepreneur; micro-foundations; small and medium enterprises.

1. Introduction

The purpose of this paper is to investigate the micro-foundations of engaging in open innovation (OI) in the context of small and medium enterprises (SMEs). More specifically, the study aims to understand the characteristics of entrepreneurs managing small companies and whether these influence the proclivity towards openness. Nowadays, in this context, the OI paradigm is almost taken for granted as a method for accelerating innovation among firms and organizations in general (Chesbrough, 2006; Sandulli et al., 2017). Specifically, this paradigm stresses the significance of using various sources of information, knowledge and technology for carrying out innovative activities (Huizingh, 2011; Brunswicker & Vanhaverbeke, 2015; Biscotti et al., 2018). Overall, research indicates that firms sourcing external knowledge are likely to achieve higher performances, as they are able to mix

different types of knowledge to reshape innovations, processes, business models and so on (Hung & Chou, 2013; Franceschelli et al., 2018). However, despite the large number of studies conducted at firm level in the OI field (Laursen & Salter, 2006; Natalicchio et al., 2017; Bogers et al., 2018) with a few exceptions at a project level (Du et al., 2014), less research has been conducted at individual level on the micro foundations of OI (Bogers et al., 2017; Bogers et al., 2018). In fact, the individual-level factors that determine firm-level openness are still neglected in literature (Bogers et al., 2017). As a result, most research on OI still “neglects the human side” (Gassmann et al., 2010: 218), so that “we still know little about how individuals who take up the open innovation role draw upon their networks to support them in this role” (West et al., 2014: 809). Thus, the micro-foundations approach means exploring which factors at the individual level may have an impact on factors at the macro or organisational level (Felin et al., 2015; Mazzelli et al., 2019).

In this regard, to the best of our knowledge, there are no studies assessing the micro-foundations of OI from the perspective of the entrepreneurs managing a small business. Accordingly, given that usually the power is centralized in small businesses, it is likely that the entrepreneur’s personal features will impact strategies and performance (Finkelstein & Hambrick, 1990). Therefore, it is reasonable to infer that personal traits of the entrepreneurs of small firms will have an impact on choices and directions (Judge et al., 2009). Hence, openness at micro-level may influence openness at macro-level in the context of SMEs, as very often smaller firms lack tangible and intangible resources (Ahn et al., 2017; Arzubiaga et al., 2018; Chaudhary & Batra, 2018). Therefore, entrepreneurs willing to be open towards external sources of knowledge can be the key towards openness at employees’ level and firm’s level (Bertoldi et al., 2018). This openness can in turn contribute to improving innovation processes and performance (Ardito & Petruzzelli, 2017; Santoro et al., 2018b).

With this in mind, this research aims to fill the gap concerning the lack of studies on the micro-foundations of engaging in OI from the entrepreneur perspective. To do so, we aim to enrich theory with new insights from real-world cases (Eisenhardt, 1989). Accordingly, a theory building approach was applied with an exploratory multiple case-study analysis consisting of eight Italian SMEs operating in knowledge intensive sectors. The information gathered through interviews with entrepreneurs indicates that several factors and variables related to the entrepreneur and employees have an impact on the propensity towards engaging in OI. These are discussed in light of the existing literature to provide several insights and implications to theory, to management and entrepreneurship.

The main theoretical implication regards the empirical study on the micro-foundations of engaging in OI from the entrepreneur perspective, since most of the research in the OI field is conducted at firm level (Bogers et al., 2018).

The rest of the paper is structured as follows. Firstly, we discuss the literature about OI to identify the research gap and pose the research question. Secondly, we discuss the methodology used, highlighting the features of the cases employed. Finally, we discuss the conclusions drawn, report the implications for theory and practice and provide limitations of the current research along with suggested areas of future research.

2. Literature review

Innovation is vital for any type of firm that aims to survive and sustain competitive advantages in the long-run (Nieto & Santamaría, 2007; Bresciani et al., 2018). However, it is extremely hard for firms to conduct all the innovation processes internally, as it requires time, resources and a great pool of competences. Firms have thus to leverage external sources to innovate (Carayannis et al., 2014; Tardivo et al., 2017; Wu & Hu, 2018), and to explore and exploit opportunities (Junni et al., 2013). Innovation sources are defined as the compilation of values, conjectures and reliable postulations that can guide practitioners to search for novel practices for the process of innovation (Amara & Landry, 2005; Ardito et al., 2015). In the current knowledge based economy, innovation entails many different sources of information (Messeni Petruzzelli et al., 2009; Shams & Kaufmann, 2016). Since innovation is highly complex and needs the synchronization of different inputs, it is important to know and understand the role of external sources in the firm's innovation process (Ferraris et al., 2017; Simao & Franco, 2018).

The OI paradigm stresses the significance of using various sources of information, knowledge and technology for carrying out innovative activities (Huizingh, 2011; Chen et al., 2011; Segarra-Ciprés & Bou-Llusar, 2018). The sources include users, competitors, universities, firms in other sectors and suppliers (Laursen & Salter, 2006). The networks formed for OI include formal ties and informal ties as well (María Viedma Marti, 2004; Santoro et al., 2018b), which can provide different types of knowledge (Haldin-Herrgard, 2000; Forés & Camisón, 2016). Two main mechanisms describe the OI model. The inbound OI mechanism regards the leveraging of technological and knowledge capabilities developed outside the boundaries of the organization to integrate those developed internally (Kang & Kang, 2009;

Spithoven et al., 2013). In turn, the outbound OI mechanism entails innovation activities aimed at capturing value by transferring knowledge and technologies to other counterparts through, for example, licensing-out (Bianchi et al., 2011; Kutvonen, 2011; Ritala et al., 2018).

Research indicates that firms sourcing external knowledge are likely to achieve higher performances, as they are able to mix different types of knowledge useful to reshape innovations, processes, business models and so on (Hung & Chou, 2013; Martinez-Conesa et al., 2017; Santoro et al., 2017). These benefits are evident in the context of larger companies (Chesbrough & Brunswicker, 2014; Ferraris et al., 2018b) and smaller ones as well (Parida et al., 2012). Despite this, there seems to be few studies on the micro foundations of OI (Bogers et al., 2017; Bogers et al., 2018). This means assessing the characteristics of individuals and how these may have an impact on innovation processes.

One exception is the study by du Chatenier et al. (2010), which studied the individual level competencies that lead to brokering solutions in OI. In turn, other scholars investigated R&D professionals' OI challenges and coping strategies (Salter et al., 2014), and another study considered how individuals' openness to external knowledge sources affects their ideation performance (Salter et al., 2015). Interestingly, Dahlander et al. (2016) found that individuals with an external focus are only more innovative (measured by patents) under conditions of high attention allocation to those sources. In addition, using a sample of Korean SMEs, Ahn et al. (2017) showed that CEOs' characteristics, namely, positive attitude, entrepreneurial orientation, patience and education, can play an important role in facilitating OI. Most recently, Rangus & Černe (2017) showed how leadership influence tactics and employee openness affect innovation performance at the individual and team levels. Another recent exception is the study of Bogers et al. (2017), which found that employee characteristics predict firms' use of external knowledge for innovation, that employees' knowledge diversity increases firm-level openness; that diversity of educational background positively relates to firm-level openness; that diversity of work history and firm-level openness do not directly relate; and that educational background diversity positively moderates the work history-openness link.

Nevertheless, many gaps exist in this specific field of inquiry. For example, to the best of our knowledge, there are no studies assessing the micro foundations of OI from the perspective of the entrepreneurs managing a small business. In this regard, the literature indicates that the owner's personal features could impact strategies and performance in smaller firms given that he/she has the authority (Finkelstein & Hambrick, 1990). Thus, it is reasonable to infer that

personal traits of owner/managers of small firms will have an impact on choices and directions (Judge et al., 2009), and as a consequence, “we urge researchers to examine interactions among different personality traits, and between traits and contextual and affective variables which play a critical role in personality–outcome relationships” (Klotz & Neubaum, 2016: 7). In this context, evidence suggests that roles enabling individuals to bring external knowledge into the firm are becoming more distributed across the organization (Ettlie & Elsenbach, 2007), and therefore employees are increasingly vital for integrating and using external knowledge (Ferraris et al., 2018a, 2018b). However, the role of leaders, especially in small businesses, is essential for guiding and inspiring business processes and OI projects alike. In fact, an entrepreneur is an individual who establishes and manages a business for the principal purposes of profit and growth, and often his/her behaviour affects that of the people who work around him/her and with him/her (De Jong & Den Hartog, 2007), especially in small companies (Stanko & Henard, 2017). As a consequence, entrepreneurs, managers and leaders in general can promote individual actions, policies, behaviours and procedures (Judge et al., 2009; Lengnick-Hall et al., 2011; Segarra-Ciprés & Bou-Llusar, 2018). If we consider small firms as a unit of analysis, the entrepreneur covers a key role as a decision maker and in spreading specific culture and values among employees (Cassia et al., 2014), therefore contributing to promoting OI mind-sets and skills. Therefore, it is possible to affirm that in small firms, with a flat and often lean hierarchical structure, openness at the level of the entrepreneur can favour openness at the level of the employees and at the organizational level (Vanhaverbeke, 2017). This openness towards external sources of knowledge and technologies favours a process of creation of new knowledge useful to improve innovative processes (Bagherzadeh et al., 2019). Nevertheless, the literature lacks studies on openness at the micro level and especially from the entrepreneur perspective.

It is well known that network ties are an important resource facilitating business growth at firm level (Ferraris et al., 2017). The entrepreneurship literature indicates that individual networks are important for managers or entrepreneurs of smaller firms who work for business growth and are always looking for opportunities (Dubini & Aldrich, 1991; Witt, 2004; Scuotto et al., 2017a). Networks of stakeholders can provide entrepreneurs access to a wide range of unique and rare resources ranging from information to knowledge, finance, ideas, insights, and suggestions (Scuotto et al., 2017b), which usually can be the keys to survival for small entrepreneurial organizations. At an individual level, a personal network consists of stakeholders with whom an entrepreneur has relationships of different types and to achieve

different tasks (Santoro et al., 2018a) Stakeholders in this case can be partners, suppliers, customers, venture capitalists, bankers, other creditors, distributors, trade associations and family members (Witt, 2004). Typically, these are individuals whom entrepreneurs meet on a face-to-face basis and from whom they obtain services, advice and moral support, as well as basic information about new laws and regulations. Individual networks can also allow entrepreneurs to acquire information and knowledge and link products and services to new markets (Dubini & Aldrich, 1991), but they require entrepreneurial contacts, knowledge and confidence. An entrepreneur's network is a learning habitat from which to gain understanding about opportunities and resources (Bowey & Easton, 2007).

Accordingly, our general research question formally states: what are the micro-foundations of engaging in OI from the perspective of entrepreneurs managing an SME?

3. Methodology

In answering the research question, we aim to enrich theory with new insights from real-world cases (Eisenhardt, 1989). Since no prior empirical research on the micro-foundations of engaging in OI from the perspective of the entrepreneur has been carried out, an exploratory, qualitative research design seems advisable to study this phenomenon (Santoro et al., 2019). In setting up a multiple case study (Yin, 2009), we established a sampling frame of criteria associated with the theoretical background and research interest of our study. The case firms established OI practices in the last three years. Moreover, they had to be entrepreneurial SMEs, namely SMEs in which the founder is currently the CEO of the organization (Heneman et al., 2000).

Organizations were finally selected for convenience (Hajli, 2014), based on our intimate knowledge of the topic and the organizations. Eight organizations meeting these criteria were identified and contacted. All the firms selected are knowledge intensive firms. Knowledge intensive firms have received an increasing amount of attention from scholars due to their capacity to enhance economic growth and create new jobs (Salavisa et al., 2012; Vrontis et al., 2017). Table 1 shows the main features of the firms involved in the study. Specifically, these firms operate in sectors such as automotive, consulting, design, software development, engineering and e-commerce. Their turnover ranges from about 500,000 euro to 14,000,000 euro.

Table 1. Descriptive information about the sample

Firms	Sector	Number of employees	Main OI practices
A	Automotive	<10	Co-R&D with suppliers and customers
B	Consultancy services	<20	Co-R&D with universities to improve the core consulting services
C	Design	<10	Crowdsourcing for new product development
D	Software development and cloud computing	<40	Client co-creation
E	Engineering	<30	Client co-creation and Co-R&D with suppliers
F	Engineering	<60	Client co-creation and Co-R&D with suppliers
G	Software development	<70	Client co-creation
H	e-commerce and web design	<20	Co-R&D with universities to foster new service development

SMEs were selected taking into account the following criteria:

- Operating in a knowledge intensive sector;
- Entrepreneur's propensity to generate innovations and face market risk;
- OI approach adopted in the last three years.

For confidentiality reasons, their names are disguised. In agreement with the firms, it was decided to provide the analysis as anonymous case studies to prevent any possible misinterpretations due to the open nature of its content (Ben Oumlil, 2013). Firms preferred to remain anonymous to avoid revealing strategic decisions and aspects, especially because of the high concentration of this industry and the limited number of well-performing players in it. Finally, anonymous cases may allow for extrapolating more real information from respondents.

Data were gathered through semi-structured interviews with entrepreneurs owning and managing SMEs. This means that all the interviewed have founded and still manage the firm. These interviews were finalized to gain a strategic overview of the organization, and especially an understanding of the micro-foundations of engaging in OI, discussing themes and factors taken from the literature.

Interviews were performed over a 3 months' period and were transcribed verbatim to allow for subsequent analysis, and complemented through extensive desk research (reports, web site, social media, press releases) to ensure credibility through triangulation of data (Jick, 1979). One unique interview protocol was adopted, with several structured questions on specific variables and factors. However, interviewees were encouraged to respond freely to

each question and to enrich their answers with additional information and personal feelings related to how they manage the companies and how they pursue OI strategies.

The number of interviews was determined in line with the theoretical saturation, until the information gathered was considered sufficient and no further relevant information could have been added by additional interviews (Strauss & Corbin, 1990). Overall, eight entrepreneurs were interviewed.

Data collected were analyzed for each case in isolation and condensed into a case write-up. Then, we asked the interviewees to review their cases, which enabled us to complete the write-up and to eliminate some of the biases associated with retrospective interviews (Silverman, 2000). Subsequently, cases were compared pair-wise to distil category-specific characteristics and corroborate the initial findings (Eisenhardt, 1989; Ozcan & Eisenhardt, 2009). Tables and colour-coding were used to identify important similarities across the cases. Then, we went back and forth between the initial findings and the original data to clarify specific details and to reach a consistent picture.

Through the analysis of the information gathered, it was possible to answer the research question and discuss the findings to be able to shed light on the micro-foundations of engaging in OI from the entrepreneur perspective.

The interview was composed of several open ended questions regarding two main factors: a) personal feelings and emotions; management approach, entrepreneurial approach; characteristics regarding employees; b) OI approaches and strategies. We touched several starting points taken from the literature. However, the respondents were free to add things or to give other information.

4. Findings

To understand the micro-foundations of engaging in OI at the entrepreneur level, we identified the peculiarities of entrepreneurs' approach in managing business processes and activities, their personal feelings and characteristics, and also the firm features. Common patterns emerged from the empirical research that helped identify the micro-foundations in line with suggestions retrieved from the literature. It has indeed emerged that there are several variables that lead to being open and to changing the paradigm within the organization. These variables have been organized in different areas concerning the entrepreneur level, employees' level and firm level. We therefore adopted a logic of the multilevel perspective on

innovation (Gupta et al., 2007; Ardito et al., 2015). This is because, while it is true that our goal is to explore the micro-foundations of engaging in OI at the entrepreneur level, the results have revealed factors at the level of employees and organization that are linked to those at the entrepreneur level.

Overall, the firms involved in the study are very active in OI processes and focus much more on a few relationships (low levels of search breadth) but very intense (high levels of search depth). In particular, specific OI projects are implemented to develop new products and services or to improve existing products and services. The most involved partners are universities, customers and suppliers. Table 2 shows the factors explaining firm level openness.

The role of entrepreneurs in openness

Regarding the first level, that is the entrepreneur level, the extent to which he/she delegates and trusts internal and external collaborators positively impacts the propensity of engaging in OI. In fact, as suggested “*the more I delegate, the more my collaborators will be free to propose partnerships, collaborations, joint projects*”. Another respondent stated “*With more delegation, my collaborators feel free to propose projects with Universities, and listen to suppliers to innovate our current products*”. One entrepreneur highlighted that, especially in service industries, “*delegation is useful to understand how to re-shape the current business model to face changes*”. These feelings were consistent in all the entrepreneurs interviewed. It seems that without delegation the entrepreneurs prefer to conduct mainly internal R&D, without a formal external focus. This has been explained by the fact that a higher number of OI sources and established OI practices increases complexity, which can only be achieved by delegation and a structured organization. As indicated by one interviewed “*We currently have few but intensive OI projects with external partners. Despite this limited number of projects, I can't follow them all personally and so I need to delegate the management of a couple of projects to a trusted employee.*” However, as highlighted, delegation itself is not enough if managers and employees are not skilled and willing to take responsibilities.

Regarding trust, all the entrepreneurs stated that it is a vital component for engaging in OI. As such “*If I do not trust a collaborator inside the organization, it is hard for me to allow him to take responsibilities or to undertake important innovative projects*”. To confirm the importance of delegation, trust, skills and willingness to take responsibility, another

interviewee stated *“We are a small company. Each innovative project or improvement to existing products/services is vital for us and is usually developed with partners. I must trust my collaborator who is working with the external partner to improve the product, otherwise we could fail and lose a lot of money, but also respect, credibility”*. However, trust in external partners is also essential to build on OI strategies. *“We just work with partners that we trust deeply. We do not have many products, but we struggle to improve them steadily. To do so we need a few partners but they must be aligned with our purpose, values and interests”*, as one entrepreneur suggested. Another interviewee affirmed *“We are open to formal collaborations to develop new solutions for our clients. We are consultants and therefore we must improve our service every day. To do so, we need a close collaboration with Universities and IT companies. We must trust these partners. We need partners available every day of the week and aligned with our vision, culture, feelings and needs. We want to bring the best service onto the market and to be flexible. For this reason, we need partners always available and ready to listen”*.

The individual ties of entrepreneurs are also vital for identifying business opportunities, business partners and establishing OI practices. In fact, entrepreneurs always thrive in unsettling and turbulent conditions and strive to find paths for business growth, looking especially at opportunities for establishing and managing ties with external stakeholders. One respondent suggested *“As manager of a small organization, I am responsible for finding business partners. I am the entrepreneur, the owner and CEO at the same time. I am the right person for presenting the business I have created. For this reason, I always struggle to do some networking activities for finding business partners”*. Another entrepreneur stated *“I try to attend business dinners, seminars, events, dinners with friends, because talking about your organization can help in acquiring information about the industry, potential investments, partners, opportunities”*. Several respondents underlined the importance of mixing personal networks with business networks. *“I try to speak of my business with my family and friends as perhaps they see something I do not see. However, business partners are important for gaining information for improving the business and innovating”*.

Finally, risk raking is a micro-foundation element that pushes towards OI practices. In fact, as suggested by many respondents, OI projects are often risky both in terms of results and investment. Of course, the choice to undertake one or more projects will depend on the risk taking propensity of the entrepreneur. As one respondent suggested, *“There are many projects for the development of new products and services that we can undertake with different*

external parties. As I am the entrepreneur and CEO, the decision whether or not to undertake these projects will depend very much on me and my willingness to take a risk. Another respondent stressed the importance of trusting internal and external partners "It's true that undertaking OI projects depends on my propensity to take risk. However, it also depends on the evaluations of my internal and external collaborators. Before making decisions, I ask them to give their opinion based on qualitative and quantitative analyses. So, when you take risk, you do it because an upstream analysis has been made."

Entrepreneurs and openness in light of employees' characteristics

Engaging in OI is not just a task for entrepreneurs and managers. The literature has suggested that, often, the ability of a firm to engage in OI lies in the employees' capacities for recognizing external knowledge and integrating external knowledge. This is especially remarked in smaller firms with simple hierarchy and informal procedures. As such, corporate culture also covers a key role in this regard, for example to avoid the Not-invented-here syndrome. Therefore, the tasks in engaging in and performing OI are multiple. As indicated by several interviewed, delegation and trust are not enough to embrace OI if managers and employees are not skilled and willing to take responsibilities. First, employees must have the necessary skills and competences, both technical and relational, to be able to manage OI projects and communicate with external partners. Second, OI involves a certain degree of risk and exposure. The employees in charge of managing these projects must be willing to undertake these risky activities that could expose them to both internal (entrepreneur) and external (partners) top management.

As a consequence, human resource management practices help in improving the benefits of OI. This found confirmation in the interviews. In detail, we found that work satisfaction, financial rewards and the individual ties of employees can help in engaging in OI. Regarding work satisfaction and financial rewards, one respondent stated "*To develop some partnerships, employees must be aligned with innovation and business strategies. To do so, they must be skilled but especially satisfied and happy to work for us. We have few employees and therefore all of them are vital to us*". Other entrepreneurs affirmed that as they are small companies, they are like little communities where each employee is important and must "have a voice". Accordingly, all of them think that the more employees are satisfied, the more they will be happy to be open for collaborations, to contribute to OI projects and willing to take

responsibilities. One entrepreneur stated “*We try to incentivise and stay close to all our employees, especially the knowledge workers who are vital for our innovation projects*”. In contrast, it has been underlined that unsatisfied employees work just because they must work and thus they just wait for the day’s end. With regard to the individual ties of employees, the interviews indicated that having employees with strong and wide networks can help in improving the business. This factor is even more important when there are high levels of delegation and trust of the entrepreneur. In fact, as suggested “*It happened that we launched an open innovation project because one of my employees introduced me to a friend that worked for an interesting company*”. Another entrepreneur stated “*We started this fruitful collaboration with the main University of the city because one employee had a contact of a Professor. After talking, we developed a successful project for enhancing our main service, which now is incredibly successful*”. To sum up, companies seem to be more open when high levels of delegation, trust, entrepreneur individual ties and risk taking approach meet high levels of work satisfaction, financial reward, employees' individual ties, skills and willingness to take responsibilities.

Entrepreneurs and openness in light of the firm context

Even though in this study we aim to explore the micro-foundations of engaging in OI at the entrepreneur level, during the interviews and also later during data analysis, it emerged that micro level and organizational level variables are often correlated. For example, several entrepreneurs highlighted that variables such as delegation, trust and work satisfaction have a strong impact on engaging in OI because they are a small business. As emphasized by several respondents “*If we were bigger, it would be much harder to explain the relationship between our features and our propensity towards having connections and establishing open innovation practices. Delegation and trust would not be enough. We would need a different system for organizing our whole company and open innovation strategies as well*”. Another stated “*If we had more (people) in our company, it would be extremely hard to control everything, to talk with everyone, and thus it would be harder to trust everybody, to satisfy everybody and to control the business*”.

Moreover, the role of age has been emphasized. “*It is easier for us to establish open innovation projects as we have a history, we have a name and a reputation. Partners know what they will find working with me and my organization, and this is extremely important*”.

The role of internal R&D was discussed with all the entrepreneurs. Some of them underlined that R&D is vital for joint projects with external partners. One stated “*We know what we want from external partners because we have steady investments in R&D and therefore we know how to do the maths*”. Another stated “*When we develop new products and services with external partners we know that it is a coupled process. We want something but we have to offer something. Internal R&D is required to know something and explore new knowledge in our field*”. The entrepreneur of the engineering company stated “*Open innovation for us is a matter of complementing internal knowledge. Open innovation is important for us but internal R&D is the key. We could live without open innovation. We could not live without internal R&D*”.

Finally, the role of innovativeness has been discussed. In detail, the discussion has been directed toward understanding the relationship between innovation projects and OI. All the entrepreneurs agreed that the greater the number of innovation projects, the more the propensity toward scanning and sourcing external knowledge and collaborations. However, a high number of innovation projects is mainly dictated by, at the entrepreneur level, delegation, trust and risk taking approach. Therefore, the characteristics at entrepreneur level have a strong influence on those at organizational level, thus impacting the adoption of OI strategies.

One entrepreneur stated “*We have many projects to be developed. For each project, we have a list of potential partners and technologies/resources that we need*”. Another stated “*The greater the number of projects, the more resources we need to develop them. Finally, it is obvious that we will need more resources from external partners, both tangible and intangible. Also, the more projects we have in our portfolio, the greater the importance of delegation and trust in my employees.*”.

Table 2. Factors explaining firm level openness

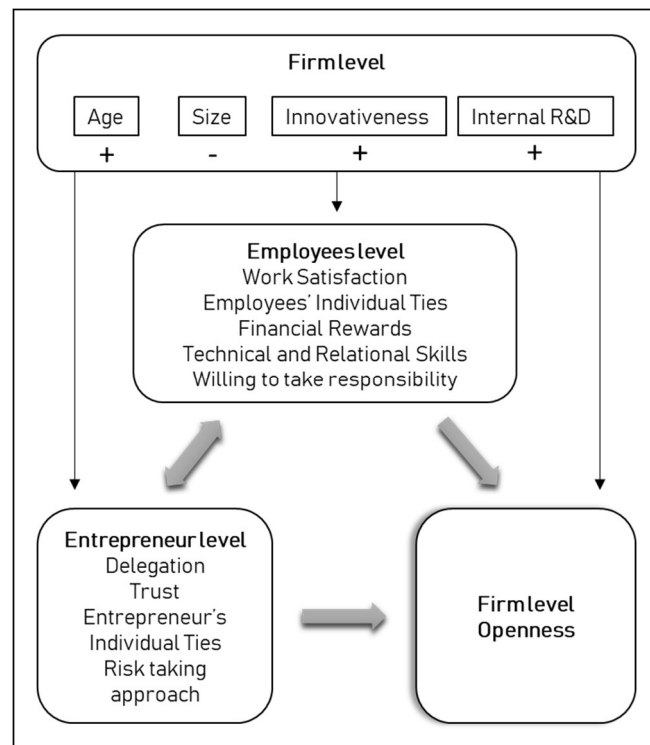
Themes	Explanation	Category
Delegation	The propensity toward delegating	Entrepreneur level
Trust	Level of trust on external partners and internal employees	
Entrepreneur's individual ties	Number and strength of individual ties with partners	
Risk taking approach	The propensity toward taking risk	
Work satisfaction	Overall employees' work satisfaction	Employees level
Employees' individual ties	Number and strength of individual ties with partners	
Financial rewards	Financial rewards given to employees in case of good performances	
Technical and Relational Skills	Ability to perform activities related to OI	
Willing to take responsibility	Willingness to engage in risky OI activities	
Firm age	Number of years since founding	Firm level
Firm size	Number of employees and turnover	
Internal R&D	Expenses in internal R&D	
Innovativeness	Number of innovation projects developed	

5. Discussion, implications and conclusions

This paper was driven by the scarcity of studies on the micro-foundations of OI, especially regarding the entrepreneur as unit of analysis. Accordingly, a theory building approach was applied with an exploratory multiple case-study analysis consisting of eight Italian SMEs operating in knowledge intensive sectors. A qualitative methodology is used for exploring the micro-foundations of engaging in OI from the entrepreneur's perspective. The information gathered through the interviews indicates that several factors and variables related to the

entrepreneur, employees and the firm have an impact on the propensity towards engaging in OI (Figure 1).

Figure 1. The interplay among entrepreneur, employees, and firm level factors in explaining SMEs openness



Regarding the entrepreneur, delegation, trust in internal and external partners, individual ties and risk taking approach increase the approach towards OI both in terms of acquiring knowledge from diverse sources (customers, suppliers, universities, etc.) and in terms of establishing different practices to innovate (licensing-in, co-R&D, etc.). First, as an increasing share of information and knowledge takes place outside the firm's boundaries, new types of firm's systems and organizations must be structured. This shift must be reflected in changes in the organization and delegation of tasks becomes more important in an OI environment (Miller & Toulouse, 1985; Galunic & Eisenhardt, 2001). Second, ties with internal and external partners support entrepreneurial orientation and success (Uzzi, 1997; Shams & Thrassou, 2019). However, these "embedded ties" must be reinforced by mutual feelings, reciprocity and especially trust (Kang et al., 2007). In fact, collaborating with external partners with different goals, structure and culture will bring challenges to both sides, which can be mitigated if the relationship is strengthened by trust and reciprocity. Trust in

employees in especially important for engaging in OI. As OI requires organizational change and given that SMEs are usually based on informal procedures and low standardization (Ahn et al., 2018), entrepreneurs must involve key employees and managers in driving this change through delegation and trust. Third, it is recognized that entrepreneurs always thrive in unsettling and turbulent conditions and strive to find paths for business growth, looking especially at opportunities for establishing and managing ties with external stakeholders (Elfring & Hulsink, 2007), especially managers or entrepreneurs of smaller firms who work for business growth and are always looking for opportunities (Santoro et al., 2018a).

Networks of stakeholders can provide entrepreneurs access to a wide range of unique and rare resources ranging from information to knowledge, finance, ideas, insights and suggestions, which can be the key to survival for small entrepreneurial organizations (Idris & Shams, 2018). At an individual level, a personal network consists of stakeholders with whom an entrepreneur has relationships of different types to achieve different tasks, such as partners, suppliers, customers, venture capitalists, bankers, other creditors, distributors, trade associations and family members. Typically, these are individuals whom entrepreneurs meet on a face-to-face basis and from whom they obtain services, advice and moral support, as well as basic information about new laws and regulations. Individual networks can also allow entrepreneurs to acquire information and knowledge and link products and services to new markets (Dubini & Aldrich, 1991), but they require entrepreneurial contacts, knowledge and confidence. To sum up, the higher the number of individual ties, to higher the likelihood of engaging in fruitful partnerships. Fourth, risk taking approach seems to impact positively on the propensity toward OI. As stated, OI requires strategic decisions and organizational change (Ahn et al., 2018), leading to a high level of uncertainty and risk. Therefore, OI adoption passes through top management decisions that may have an impact on the future of the organization and, in case of radical innovation, of the whole industry.

Moreover, it has emerged that several factors regarding employees contribute to establishing OI strategies. The interviews have also underlined that entrepreneur level factors have an impact on employee level factors in the sense that their joint effect contributes to being open. For example, together, as suggested by some respondents, delegation and trust have a positive effect on employee work satisfaction, increasing the propensity to OI. This is because with more delegation and trust, the employee feels more involved in the business activities, increasing their effort towards achieving the objectives. As such, engaging in OI is not just a responsibility for entrepreneurs and managers. The literature has suggested that, often, the

ability of a firm to engage in OI lies in the employees' capacities of recognizing external knowledge and integrating external knowledge (Bogers et al., 2018). Corporate culture also covers a key role in this regard, for example to avoid the Not-invented-here syndrome (Katz & Allen, 1982).

First, work satisfaction and financial rewards have an impact on openness, as to develop some partnerships and acquire external information and knowledge, employees must be aligned with innovation and business strategies (Qu & Zhao, 2012). To do so, they must be satisfied with positive feelings toward daily activities and work. This means that human resources management practices can be strategically used to support external ties both with regard to establish collaboration and managing the established projects (Kang et al., 2007). From the interviews, it has emerged that financial rewards increase work satisfaction which in turn reduces social loafing (Ferraris et al., 2018c). Accordingly, all of the interviewees asserted that the more employees are satisfied, the more they will be happy to be open for collaborations and contribute to OI projects. Second, individual ties are crucial at the employees' level too. In particular, weak and non-redundant networks, rich in structural holes, are likely to enable employees to access novel and diverse sources of knowledge that are crucial (Del Giudice & Maggioni, 2014; Ferraris et al., 2018c; Scuotto et al., 2017). Moreover, personal contact can open up future collaborations and projects, as emerged.

At firm level, it has been highlighted that the age of the firm contributes to create a reputation and therefore increase the likelihood of being recognized as a potential key partner (Huergo & Jaumandreu, 2004). Regarding the size, it emerged that its impact on OI is controversial (Dewar & Dutton, 1986). On the one hand, larger firms have more resources to invest in OI processes and activities. On the other hand, smaller organizations have a need to acquire external resources and suffer the liability of smallness (Parida et al., 2012; Rua et al., 2018). In this sense, while our findings cannot tell us whether the size impacts directly on engaging in OI, we found that the size can have an impact on entrepreneur and employee level factors, which then impact OI. In detail, we propose that delegation, trust, ties, work satisfaction and financial rewards have a higher impact on OI engagement in smaller firms. One possible explanation could be that in smaller organization, the entrepreneur/CEO has more frequent interactions with each employee (Miller & Toulouse, 1985).

These findings help us to provide several implications to theory and further our knowledge in this field of research. The present research contributes to the field of OI, with an empirical study on the micro-foundations of engaging in OI from the entrepreneur perspective in the

context of SMEs. In fact, most of the research in the OI field is conducted at firm level (Mention, 2011; Bogers et al., 2018) with a few exceptions at project level (Du, Leten, & Vanhaverbeke, 2014). Even less research has been conducted at individual level which comprises the micro-foundations of OI (Ahn et al., 2017; Bogers et al., 2017; Ahn et al., 2018; Bogers et al., 2018). Therefore, the study contributes to the literature on OI in SMEs indicating that some features at entrepreneur and employee level are antecedent of engaging in OI. Specifically, our study advances the findings of Ahn et al. (2017), which showed that CEOs' characteristics, namely, positive attitude, entrepreneurial orientation, patience and education, can play an important role in facilitating OI. In this regard, we confirm that in smaller firms with a centralized decision-making power, the OI adoption is strongly influenced by the entrepreneur given that he/she owns the firm. Specifically, we suggest that, at an entrepreneur level, delegation, trust, individual ties and risk taking approach facilitate OI in SMEs. Moreover, we confirm the findings of Rangus & Černe (2017), which showed how leadership influence tactics and employee openness affect innovation performance at the individual and team levels. In this regard, we show that entrepreneur level factors (delegation, trust, individual ties and risk taking approach) have an impact on employee level factors such as work satisfaction, financial rewards, individual ties and willingness to take responsibility, which in turn increase the effect on the propensity toward OI.

This study also has practical implications. Given that usually the owner-manager of the small business has the authority, his/her behaviours and choices will strongly influence the adoption of an open culture within the organization. Thus, it is reasonable to infer that personal traits of owner/managers of small firms will have an impact on strategies. In this context, even if it is true that roles enabling individuals to bring external knowledge into the firm are becoming more distributed across the organization, and therefore employees are increasingly vital for integrating and using external knowledge, the role of leaders, especially in small businesses, is essential for guiding and inspiring business processes and OI projects alike. In fact, an entrepreneur is an individual who establishes and manages a business for the principal purposes of profit and growth, and often his/her behaviour affects that of the people who work around him/her and with him/her, especially in small companies. Accordingly, entrepreneurs, managers and leaders in general can promote individual actions, policies, behaviours and procedures. If we consider small firms as a unit of analysis, the entrepreneur covers a key role as a decision maker and in spreading the culture and values among employees, therefore contributing to promoting OI mind-sets and skills, as shown by our cases. Hence,

entrepreneurs should be able to recruit proper people and increase openness through delegation and trust. As such, the top management of smaller companies must recognize the relevance of the culture in implementing OI.

Although it was not our goal to understand whether an open approach leads to superior performance, all respondents indicated that having an open approach is critical to survive in an increasingly competitive market. Our findings indicate that openness at the organizational level requires openness at the micro level (entrepreneur and employee level). As a result, we advise managers and entrepreneurs in small businesses to open up to external sources of knowledge of different kinds. For example, relationships with consultants and also other entrepreneurs can provide more knowledge for understanding and capturing changes related to laws, regulations and so on. Of course, this requires time and social capability to nurture and manage each relationship. Following an OI logic, entrepreneurs must be able to open up their critical and business thinking to increase their social capital and improve their attitudes towards resilience, thus contributing to their businesses. This is because they cannot just rely on their in-house resources and skills to plan and implement activities in a way that would sustain their competitive advantage. Therefore, entrepreneurs should spend time in networking activities with heterogeneous stakeholders ranging from internal stakeholders such as family members, to external business actors such as customers, suppliers and institutions. This could really create the foundation for building confidence in themselves so that they can deal with unexpected situations with optimism and ultimately increase their success.

Notwithstanding our attempt to provide contributions for both theory and practice, we are aware of the limitations of our study, since its exploratory nature and its relative small sample of analysis does not allow generalizing the findings to any population of organizations. In fact, the findings are drawn from just eight cases and therefore it is hard to generalize them. Future studies could try to develop a quantitative analysis to explore the relationships among the proposed variables. Moreover, we used a single respondent for each organization. Although we talked with the main person (entrepreneur/CEO), future studies could gain information from employees too. Finally, we focus on organizations working in a single country. Moreover, they do not export. Future studies could try to understand whether these micro-foundations have an impact on innovation performance as well as internationalization performance.

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