Barriers to Innovation among Micro and Small Enterprises: Evidence from Italian Agricultural Machinery Industry

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Abstract

Micro-Small and Medium Enterprises (MSMEs) are the principal actors of the innovation process in the national business system of countries. Despite this, these enterprises face many economic, organizational and market barriers which may hinder the implementation of innovations. This issue is particularly relevant in Italy, where MSMEs represent 99% of the enterprises. The present study aimed to investigate the willingness to invest in innovations and related perceived barriers in a group of micro and small enterprises operating in the agricultural machinery manufacturing industry in northern Italy. Forty-two enterprises answered a questionnaire investigating: i) firm's characteristics, ii) interest in introducing innovation and willingness to invest in it, iii) perceived barriers and iv) respondent's socio-demographic information. Overall, economic issues, the lack of qualified personnel and difficulty in finding cooperation partners were cited as the foremost barriers. In detail, the firms with a higher level of management organization and more willing to invest in innovations were also those perceiving barriers the most. Our results showed that enterprises are actually trying to innovate but targeted measures and interventions should be adopted to support the firms in the innovation process. Implications and future research developments to promote innovation in micro and small enterprises are discussed.

Keywords

Agricultural Machinery; Perceived Barriers; Innovation management; MSMEs; Survey.

1. Introduction

Innovation plays a key role in the competitiveness of companies (Madrid-Guijarro et al. 2009) and can be defined as a process that leads to the commercialization of an invention born from a new idea; then, when the innovation reaches the market it becomes part of normal practice and procedure (Schumpeter,1939). In recent years, innovation processes have increasingly addressed socio-environmental issues, thus leading entrepreneurial activities toward sustainable development (Dias Angelo et al. 2015), in accordance with the significant presence of regulations promoting the adoption of environmental innovations and the institutional pressures toward such innovations (Pinget et al. 2015).
Innovation consists of several activities (Antonioli et al. 2010) which can be classified into three main macro-categories: technical innovation, marketing innovation and organizational innovation. Moreover, the Organization for Economic Co-operation and Development (OECD) discerns technical innovation in two other categories, product innovation and process innovation (Avolio et al. 2014; OECD, n.a). Product innovation involves the development of a good or service that is new or significantly improved in technical specifications, components and materials, embedded systems, user-friendliness or other functional characteristics; likewise, through process innovation the

companies create a new or significantly improved manufacturing process or delivery method, thus including deep changes in techniques and/or software. The main difference between product and process innovation is that the former aims at differentiating the output of the company, while the latter, usually, has the main purpose of reducing the expenses and the production cost. Marketing innovation involves significant changes in product design or packaging, product placement, product promotion or pricing; whereas organizational innovation is based on new methods in business practices, workplace organization or external relations (OECD, n.a). All these types of innovations are affected by both the technological level of the company (in terms of available instruments and human resources) and by the level of investment in research and development activities (Pinget et al. 2015).

Despite the relevance of innovations to reach the aim of sustainable development (Pinget et al. 2015), many barriers still hinder the spread of innovative practices in the enterprises (Long et al. 2016; Madrid-Guijarro et al. 2009; Trianni et al. 2013). A detailed framework describing the barriers to innovation is reported by Tiwari et al. (2007), who distinguish six main barriers to innovation: i) financial (e.g. hindered access to external finance, high innovation costs that might not be sufficient to cover the investments required and thus the economic risks), ii) lack of qualified personnel, iii) limited internal know-how to effectively and efficiently manage the innovation process (e.g., missing project management know-how), iv) missing market know-how (e.g., to meet customer's needs), v) bureaucratic aspects (e.g., long administrative procedures, restrictive laws and regulations), and vi) lack of intellectual property rights. A more simplified framework was instead reported by Trianni et al. (2013) who divided innovation barriers into "structural" barriers and "behavioral" barriers. The first includes factors related to costs and lack of financial resources (both internal and external sources), government fiscal and regulatory policies, codes and standards; the second, includes factors related to the perceived risk of innovation efficiency investments, information gaps, and lack of incentives. Understanding which barriers limit the adoption of the different types of innovations within different enterprises is fundamental to develop effective policies to overcome such barriers (Trianni et al. 2013).

1.1 Innovation in Micro-, Small and Medium Enterprises - MSMEs

Besides playing a fundamental role in the national economies of countries all around the world, Micro-, Small- and Medium-sized Enterprises (MSMEs), are increasingly recognized as central contributors to innovation. Indeed, while in the past years innovation-related activities and resources have been traditionally conducted by large firms (particularly in the field of business management), recently also small firms and their entrepreneurs have received growing attention and have been widely appreciated for their role as innovators (Varis and Littunen 2010).

In the European context the importance of MSMEs in the innovation processes is also related to the fact that they represent a large share (99%) of all businesses in the European Union countries (European Commission, n.a.) and the same is true at the Italian national level: according to the latest statistics, in Italy micro-enterprises represent the 82,5% of all business, small enterprises are the 15% and only the remaining 2,5% is composed by medium and large enterprises (ISTAT 2019).

Despite MSMEs needing to innovate to increase their competitiveness, previous studies reported that many barriers hinder the development of innovative strategies and innovation activities (Madrid-Guijarro et al. 2009; Trianni et al. 2013; Maldonado-Guzman et al. 2016). In addition, these barriers may change over time and based on the enterprise sector (Hadjimanolis, 2003). As reported by D'Este et al. (2012) and Veugelers et al. (2019) also being a young enterprise can increase the probability of facing relevant cost and market barriers; whereas investigations conducted in developing countries reported that the "inadequate financial means to conduct research on new innovation, inadequate government assistance, poor infrastructural facilities" were the main factors limiting the diffusion of innovations in MSMEs (Nassar and Faloye, 2015 p. 209; Wellalage and Fernandez, 2019). Previous studies conducted among European small and medium enterprises showed that the inadequate financial resources - and the consequent financial risks and innovation cost - and the difficulty in recruiting qualified human resources represent the two main barriers to innovation in countries such as Spain, Germany, Czech Republic, UK and Italy (Madrid-Guijarro et al. 2009; Galia and Legros, 2004; Iammarino et al. 2006; Tiwari and Buse, 2007; Tovstiga and Birschall, 2007; Necadova and Scholleová, 2011). In countries like Cyprus and the UK the lack of time was identified as an additional relevant factor (Hadjimanolis, 1999; Tovstiga and Birschall, 2007). Furthermore, in Hadjimanolis, 2003 more emphasis is given to MSMEs managers since their positive perception and attitude toward innovations is considered as fundamental.

1.2 Context and aim of the present study

During the last century, innovation had a pivotal role in the debate about the links between agriculture, environment, society and economy (Avolio et al. 2014). Agriculture is a sector with significant applications characterized by highly innovative technology (Sassenrath et al. 2008), and technological innovation in the agricultural machinery industry

has revolutionised farming, increasing labour productivity, improving the environmental compliance, and enhancing workplace safety for the operators, in light of the societal modifications the sector is experiencing (Caffaro et al. 2018; Cavallo, et al. 2014; Fargnoli et al. 2013). Innovation particularly regarded tractors and equipment in agricultural operation, since they are the most important machineries for both the farm itself and the agricultural market (Cavallo et al. 2014). Indeed, despite the economic and political factors that have reduced the spending power of farming and enterprises, the demand for agricultural machinery is still high (FederUnacoma 2018).

Among the European countries, Italy has stood out for being the third largest exporter of agricultural machinery in the world for years (Gorissen et al. 2015). Indeed, in Italy, the agricultural machinery industry is a fundamental driving force for the development of the agricultural sector, representing approximately 1% of Italian Gross Domestic Product (GDP) and covering approximately 2% of total Italian exports. In 2018 the estimated value of total Italian agricultural machinery production was 11.4 billion euros and the value of exports was slightly less than 5 billion (FederUnacoma 2018). In detail, based on the Ateco codes (namely the Italian classification of economic activities), the Italian production in the machinery and equipment sector was three times higher compared to other European countries (1.7% against the 0.5%). Positive trends were also reported for "Repairing, maintenance and installation of machinery and equipment" and "Installation of machinery equipment" (Confartigianato, 2017). Moreover, Italy is known to be the land of small enterprises (Coppa and Sriramesh 2012), and a high rate of micro and small enterprises are concentrated in the north of the country (Banca Ifis Impresa 2018; ISTAT 2018). The same holds true for the agricultural machinery and equipment sector. Considering the relevance of MSMEs for the national business system and the development of innovations, and the barriers these enterprises have to be confronted with because of their resource constraints (Hadjimanolis 1999; Hewitt-Dundas 2006), a better understanding of the perceived innovation barriers and their relationships with enterprises' characteristics would be particularly beneficial to micro and small firms, to identify critical areas deserving targeted interventions.

Starting from these considerations, the present study aimed at providing a preliminary overview of the willingness to invest in different types of innovation and perceived barriers in a group of micro and small enterprises operating in the agricultural machinery industry in Italy.

2. Materials and methods

2.1 Participants and setting

The survey was carried out in the Piedmont region (North-West of Italy) during fall 2019. The Piedmont region hosts some of Italy's leading enterprises in the sector of agricultural machinery, and it is characterized by a significant presence of MSMEs. In particular, according to the last available data, the agricultural machinery and equipment industry in Piedmont accounts for a turnover of 550 million euros and an export of around 40% (TargatoCn, 2018). A list of 52 micro and small enterprises to be involved in the study was provided by ARPROMA, one of the Italian biggest agricultural machinery manufacturers' associations. Fifty-two enterprises received a questionnaire by email addressing the business owner, or any other responsible for innovation issues in the company.

2.2 Instrument

This study was part of larger research designed to identify agricultural machinery manufacturers' attitudes, behaviours and expectations toward innovation. The questionnaire was composed of four sections. The first section was designed to investigate the firm's characteristics, namely annual turnover and related share of exports, number of employees and type of organization for the management of innovative projects. The second section of the questionnaire was designed to assess companies' interest in introducing different categories of innovation (good or service innovation, process innovation, marketing innovation, organizational innovation) and companies' willingness to invest in expenses for innovation (4-point Likert scale, with 1 = not important, to 4 = very important) in the next three years (Table 1). In the third section, the participants had to rank the importance of 9 potential barriers to the implementation of innovative activities (4-point Likert scale, with 1 = not important, to 4 = very important). Variables referring to potential barriers were identified based on previous studies (Long et al. 2016; Trianni et al. 2013; Madrid-Guijarro et al. 2009) and included: three economic barriers, three market barriers and three organizational barriers (Table 2). Finally, a standard sociodemographic form assessing respondents' characteristics (gender, age, education, role in the company, years of experience in the agricultural machinery sector, and years worked in the current company) ended the questionnaire. This paper reports the preliminary results of the investigation.

2.3 Data processing and analysis

Descriptive statistics (means and frequencies) were computed for the variables of interest, in order to provide an overview of investigated firms' characteristics and their responses about innovation and barriers to innovation. In this

regard, firm size was categorized into micro and small enterprises, following the definition provided by EU recommendation 2003/36. Regarding barriers, a series of one sample t-tests were performed to check if the rating obtained by each barrier was significantly higher or lower compared to the critical value of 3.00 ("fairly important barrier").

To perform subsequent analyses, based on Trianni et al. (2013), the firm's level of organization for managing innovation projects was coded as low (coded as 1) or high (coded as 2), as the willingness to invest in innovation (1=low willingness, 2= high willingness). Subsequently, since the normality test failed for firm turnover, export and staff headcount, a non-parametric Spearman correlation analysis including firms' characteristics and the nine barriers mean score was performed to provide insights about the relationships between the variables. Moreover, following the approach suggested by Trianni et al. (2013), results of the investigation have been discussed starting from the analysis of the total sample and then clustering mean scores for barriers according to firm size, firm organization to manage innovation projects and firm willingness to invest in innovation. Thus, comparisons between the obtained clusters were performed using independent samples t-tests. Data processing and analysis were performed using the statistical package SPSS version 26.0 (IBM Corp., Armonk, NY, USA).

3. Results and discussions

A total of 42 micro and small enterprises, out of the 52 enrolled, returned the questionnaire. Enterprises' characteristics and clustering are displayed in Table 1. The majority of the responding firms (54.8 %) were small-sized enterprises while 45.2% were micro-enterprises. Concerning the level of organization to implement innovations, 50% of firms reported managing innovation projects through specifically assigned staff (high level of organization) whereas the rest of the firms reported not having any specific organizational solution (low level of organization). Regarding the interest in introducing different types of innovations in the next three years, the majority of the interviewed enterprises reported a higher interest in goods and service innovation. Approximately one third of the firms (33.3%) resulted in a low willingness to invest in innovation.

Table 1. Descriptive statistics and frequency of distribution for firms' investigated variables.

Variable		Mean	SD
Firms turnover (M€/year)		3.51	8.79
Firms staff headcount (n)		12.67	3.38
Firms export (%)		31	30.5
Variable	**Level**	**n**	**%**
Firms size	Micro-Enterprise	19	45.2
	Small-Enterprise	23	54.8
Firms organization to manage innovation projects	Low level	21	50.0
	High level	21	50.0
Firms willingness to invest in innovation	Low willingness	14	33.3
	High willingness	28	66.6

3.1 Analysis of the total sample

With respect to the whole sample, the mean ratings for the three types of perceived barriers investigated are displayed (Table 2). Overall, the more relevant category of perceived barriers were the economic ones, followed by market and organizational barriers. In particular, "Difficulty in receiving public grants and other forms of financial support for innovation" resulted as the most important barrier, followed by "Lack of qualified personnel". The t-tests revealed that 7 out of the 9 considered barriers were rated significantly lower than the critical value of 3.00 ("fairly important barrier", p-value <.01), meaning that in general, the inquired companies did not perceive the investigated barriers as a severe obstacle to innovation. Our results are consistent with those reported in previous studies (Cecere et al. 2020; Hadjimanolis et al 1999; Madrid Guijarro et al. 2009; Tiwari et al 2007; Zhu et al. 2012) where financial and bureaucratic issues, the lack or shortage of qualified personnel and trouble to find cooperation partners were identified as the foremost barriers.

Table 2. Taxonomy for the barriers to the implementation of innovations: categories and barriers mean scores for the whole investigated sample.

Category	Mean score (SD) per category	Barrier	Mean score (SD) per barrier
Economic barriers	2.63 (0.77)	Lack of financial resources within the company	2.50 (0.89)
		Lack of financial resources outside the company (credit or private equity)	2.57 (0.94)
		Difficulty in receiving public grants and other forms of financial support for innovation	2.83 (1.00)
Market barriers	2.29 (0.57)	Scarce demand for innovation on the reference market	1.98 (0.81)
		Unstable demand for innovative products or services	2.26 (1.01)
		Strong competition on the market	2.64 (0.82)
Organizational barriers	2.24 (0.65)	Lack of good ideas to innovate	1.90 (0.72)
		Lack of qualified personnel	2.69 (1.07)
		Lack of cooperation partners	2.05 (0.89)

Table 3 reports the Spearman correlations among the variables of interest. As expected, firms' characteristics such as turnover, staff headcount and export share were positively correlated to each other. Moreover, variables related to firm size (turnover and staff) resulted positively correlated with a perceived lack of good ideas to innovate (barrier 10) meaning that the larger the firm, the higher was the importance of evaluating the goodness of the idea before innovating (Dervitsiotis 2011). Firms with a higher share of income from exports appeared to perceive more difficulties in receiving public grants and other forms of financial support for innovation (barriers 5-6) and a lack of cooperation partners (barrier 12). Moreover, looking at existing correlations between the barriers, it is possible to notice that most of the significant relationships between barriers just mirrored the three categories in which the barriers have been classified following the literature taxonomy (Table 2).

Table 3. Bivariate Spearman correlations between main SMEs' variables and perceived barriers to innovation.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Turnover (M€/year)	1	,852**	,508**	-0.131	0.230	0.295	-0.141	-0.072	0.117	,372*	0.125	0.003
2. Staff headcount (n)		1	,496**	-0.074	0.232	0.135	-0.229	-0.039	0.212	,307*	0.177	-0.040
3. Export (%)			1	0.229	,440**	,652**	-0.116	0.180	0.217	0.307	0.228	,360*
4. Lack of financial resources within the company				1	,478**	,372*	-0.030	0.115	-0.056	0.083	0.093	0.232
5. Lack of financial resources outside the company (credit or private equity)					1	,561**	-0.139	0.278	0.176	0.062	0.296	,507**
6. Difficulty in receiving public grants and other forms of financial support for innovation						1	0.056	,340*	0.145	0.238	0.215	,623**
7. Scarce demand for innovation on the reference market							1	,518**	-0.181	0.155	0.097	,323*
8. Unstable demand for innovative products or services								1	0.014	0.042	0.132	,477**
9. Strong competition on the market									1	0.209	0.281	0.042
10. Lack of good ideas to innovate										1	,309*	0.136
11. Lack of qualified personnel											1	,386*
12. Lack of partners to cooperate with												1

Note: * p < .05, ** p < .01, *** p <.001.

3.2 Analysis by firm size

Table 4 shows the mean ratings of barriers perception for micro and small enterprises. In detail, micro-enterprises perceived the lack of qualified personnel (mean rating 2.74 points), the difficulty in receiving financial support (2.68 points) and the strong competition in the market (2.63 points) as the most important barriers, whereas small enterprises denounced the lack of financial resources outside the enterprise, public grants and other forms of financial support (2.95 and 2.75 points), strong competition on the market (2.65 points) and lack of good ideas to innovate, this last resulting significantly more important for small firms than for micro-firms. The present results are consistent with those by Madrid Guijarro et al. (2009), who reported that the smaller enterprises have the higher difficulty in finding cooperation partners, and with the study conducted by Schleich (2004) and Pinget et al. (2015), suggesting that the firm size is relevant in the perception of those barriers concerning the uncertainty and stability of the market. This

may be due to the fact that probably larger firms used to have more expert personnel and human resources for managing uncertainty than smaller enterprises.

Table 4. Perceived barriers according to firm size (Micro Enterprises versus Small Enterprises).

Barrier	Mean rating	Micro	Small	t-test
Lack of financial resources within the company	2.50 (0.89)	2.58 (0.84)	2.43 (0.94)	0.518
Lack of financial resources outside the company (credit or private equity)	2.57 (0.94)	2.42 (0.90)	2.70 (0.97)	-0.940
Difficulty in receiving public grants and other forms of financial support for innovation	2.83 (1.00)	2.68 (0.94)	2.95 (1.05)	-0.863
Scarce demand for innovation on the reference market	1.98 (0.81)	2.16 (0.90)	1.83 (0.71)	1.332
Unstable demand for innovative products or services	2.26 (1.01)	2.37 (1.06)	2.17 (0.98)	0.614
Strong competition on the market	2.64 (0.82)	2.63 (0.83)	2.65 (0.83)	-0.080
Lack of good ideas to innovate	1.90 (0.72)	1.63 (0.76)	2.13 (0.62)	-2.333*
Lack of qualified personnel	2.69 (1.07)	2.74 (1.05)	2.65 (1.11)	0.252
Lack of partners to cooperate with	2.05 (0.89)	2.06 (0.72)	2.04 (1.02)	0.042

Note: Mean rating on the scale 1 (Not Important) to 4 (Important). The marker (*) reported in the column "t-test" indicates that the difference between the two clusters (Micro vs. Small) is significant ($p < .05$).

3.3 Analysis by firm level of management organization

The analysis of perceived barriers with respect to firms' level of organization has provided some unexpected results (Table 5). First, companies with a low level of organization reported a higher mean rating compared to companies with a high level of organization only for two barriers, both related to the market (namely the scarce demand for innovation on the reference market and strong competition on the market). In detail, this is consistent with the study conducted by Hutter et al. (2013), showing that the high workload and competitive pressure to which micro and small enterprises are forced to undergo, prevent them from the successful development of innovative ideas and new products. Furthermore, micro and small enterprises have more criticalities than larger competitors when it comes to a well-structured, planned marketing strategy, especially when they have to launch new products outside their main market (Hutter et al. 2013).

Contrary to expectations, SMEs with a higher level of organization to manage innovation projects, reported a higher mean rating of perceived barriers than less organized enterprises in 7 out of 9 barriers. Indeed, previous studies generally reported that the presence of an innovation department inside the enterprise itself or collaboration with an R&D institute could produce positive effects on the ability to introduce new products utilities in the market and being involved in product and/or process innovation (Hall et al. 2009; Ussman et al. 2001). However, the result could be affected by the limited sample investigated and by other variables, such as the sociodemographic characteristics of the respondents (Aidis 2005). Thus, in further study it will be interesting to investigate how the characteristics of entrepreneurs and innovation managers can affect the development of innovation in SMEs.

Table 5. Analysis of perceived barriers according to the level of organization for the management of innovation projects (Low level of organization, versus High level of organization).

Barrier	Total	Low organization	High organization	t-test
Lack of financial resources within the company	2.50 (0.89)	2.29 (0.95)	2.71 (0.78)	-1.589
Lack of financial resources outside the company (credit or private equity)	2.57 (0.94)	2.24 (0.83)	2.90 (0.94)	-2.430*
Difficulty in receiving public grants and other forms of financial support for innovation	2.83 (1.00)	2.48 (0.93)	3.20 (0.95)	-2.465*
Scarce demand for innovation on the reference market	1.98 (0.81)	2.10 (0.77)	1.86 (0.85)	0.950
Unstable demand for innovative products or services	2.26 (1.01)	2.14 (0.96)	2.38 (1.07)	-0.757
Strong competition on the market	2.64 (0.82)	2.76 (0.70)	2.52 (0.93)	0.938
Lack of good ideas to innovate	1.90 (0.72)	1.81 (0.75)	2.00 (0.70)	-0.847
Lack of qualified personnel	2.69 (1.07)	2.52 (1.08)	2.86 (1.06)	-1.009
Lack of cooperation partners	2.05 (0.89)	1.81 (0.68)	2.30 (1.03)	-1.807

Note: Mean rating on the scale from 1 (Not Important) to 4 (Important). The marker (*) reported in the column "t-test" indicates that the difference between the two clusters (Low organization vs High Organization) is significant ($p < .05$).

3.3 Analysis by firm willingness to invest

The analysis of perceived barriers with respect to companies' willingness to invest showed that all the economic barriers were perceived as the most relevant for the enterprises which declared a high level of willingness to invest; whereas the enterprises with low willingness to invest in innovation reported a higher mean rating compared to others, only for barriers related to the scarce demand for innovation on the reference market. Similarly, Antonioli et al. (2017), and Garcia-Quevedo et al. (2017) stated that a lack of or a stagnant demand are key factors for innovation investments. Moreover, considering the enterprises with a high willingness to innovate, the insufficient access to financial resources was felt more pressingly when the enterprises had an actual opportunity for the rapid growth of their activities (Peneder 2008; Pinget et al. 2015).

Table 7. Analysis of perceived barriers according to the level of willingness to invest in innovation (Low level of willingness to invest, versus High level of willingness to invest).

Barrier	Total	Low willingness	High willingness	t-Test
Lack of financial resources within the company	2.50 (0.89)	1.89 (0.78)	2.64 (0.83)	-2.411*
Lack of financial resources outside the company (credit or private equity)	2.57 (0.94)	1.89 (1.05)	2.86 (0.80)	-2.914*
Difficulty in receiving public grants and other forms of financial support for innovation	2.83 (1.00)	2.33 (1.22)	3.07 (0.87)	-1.988*

Scarce demand for innovation on the reference market	1.98 (0.81)	2.22 (0.97)	1.86 (0.75)	1.176
Unstable demand for innovative products or services	2.26 (1.01)	2.33 (1.22)	2.39 (0.95)	-0.152
Strong competition on the market	2.64 (0.82)	2.44 (1.13)	2.64 (0.73)	-0.617
Lack of good ideas to innovate	1.90 (0.72)	1.56 (0.53)	1.86 (0.70)	-1.177
Lack of qualified personnel	2.69 (1.07)	2.44 (1.2)	2.68 (1.05)	-0.556
Lack of cooperation partners	2.05 (0.89)	1.88 (0.83)	2.14 (0.97)	-0.708

Note: Mean rating on the scale from 1 (Not Important) to 4 (Important). The marker (*) reported in the column "t-test" indicates that the difference between the two clusters (Low willingness to invest vs High willingness to invest) is significant ($p < .05$).

4. Conclusions

The objective of this study was to investigate barriers that hinder the adoption of innovation among Italian micro and small enterprises belonging to the agricultural machinery manufacturing industry which, to our knowledge, is an under-investigated sector. Despite the small number of firms involved, the present study gave some first relevant insights on the drivers of innovation among micro and small enterprises, which are the engine of the Italian national economy, representing a source of jobs and increasing the competitiveness among the productive activities.

The willingness to invest in innovation is affected mainly by the availability of financial resources within the company and its ability to obtain external subsidies or public grants. Moreover, other investors could be reluctant to provide financing, since they are not sure the entrepreneur could avoid potential competitors, and thus protecting the future turnover of the innovation (Peneder 2008). Thus, in case of strong willingness for innovation, the smallest enterprises in absence of funding could be forced to give up implementation of more expensive innovative technologies. The present study also highlighted the need for the enterprises to improve their existing functions, to increase the skills of internal personnel and to network and collaborate with local associations and institutions (e.g. Chambers of Commerce, Industrial Associations). These kinds of activities could also increase knowledge of information sources and supporting programs on MSMEs. Indeed, it is not unusual that smaller enterprises are unaware of public grants and other forms of financial support programs, thus losing the opportunity to innovate (Trianni et al. 2013). Future development of the present research involving a larger number of enterprises will allow further considerations on the relevance of different barriers in innovation adoption and will help to identify areas for targeted interventions to promote innovation in micro and small enterprises.

Acknowledgements

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