



UHASSELT

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Faculty of Business Economics

Master of Management

Masterthesis

An investigation of Italian SME innovation and performance.

Francesco Diana

Thesis presented in fulfillment of the requirements for the degree of Master of Management, specialization International Marketing Strategy

SUPERVISOR :

dr. Ingrid RUSKOWSKI



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Summary

Innovation plays a critically important role in SMEs ability to respond effectively to the challenges and the opportunities of global economies.

However, managing innovation is quite a complex and a resources/time consuming process and its results are by no means guaranteed. Moreover, there are different kinds of innovation namely product, process and management innovation and not all of them might result relevant for SMEs' growth and success, or not all of them might have the same importance for these firms.

In addition, the peculiarities of small and medium sized companies like the owner's experience, the little formality or the high organizational flexibility can represent facilitators or barriers to SMEs' innovativeness. Likewise, the nature of the innovation in these companies is usually informal and incremental, and consequently it is more difficult to measure it with the traditional indicators like R&D or patents.

Starting from these premises, the aim of the thesis has been to determine to which extent the innovation affects the performance of Italian SMEs that are usually identified as not innovative. Grounded on this purpose, the central research question has been identified as: Does innovation enhance the performance of Italian SMEs?

The research is based on an adaptation of the model proposed by van Auken et al. (2008) that measures the innovation effects on firms' performance using a subjective approach, as said the managers' perception of the innovation activities on the company's results.

The research has been conducted by means of an online questionnaire that consists of a combination of performance and innovation related questions, and further informative questions. The questionnaire has led to a sample size of 172 Italian SMEs after cleaning for incomplete responses.

The analysis has been performed using descriptive, univariate and multivariate dependence statistics techniques and the following results have been identified.

Italian SMEs are moderately innovative and those which invest more in innovation achieve better performance levels. Among the innovation types, product innovation is acknowledged as the most important determinant of Italian SMEs performance following by managerial and process innovations. However, combining the innovation types is more rewarding than investing in just one of them. Finally, a significant difference is found in the managerial innovation adopted by Italian family firms, which is below the level of non-family firm innovation, attributing some kind of resistance to the introduction of this innovation type.

Based on this, the following conclusions have been drawn. The innovation is crucial for Italian SMEs. However, because of their constraints they prefer to invest in product innovation as it is the easiest way to reach valuable financial results in the short term. This means that additional resources and efforts on the innovation shortcomings would be required.

Preface

I would like to give special thanks to my promoter dr. Ingrid Ruskowski for the guidance and the support she provided me during the thesis process. She always helped me with advices and remarks that made the thesis possible.

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Chapter 1

Introduction

Innovations constitute an essential component of the firm strategies for several reasons such as to improve the productivity, to strengthen the market performance, to increase the reputation in customers' perception (Gunday et al., 2011) and it is vital for SMEs, because it is among the most important means through which they stay competitive (Madrid et al. 2013).

However, devoting significant resources to innovation does not automatically generate a positive outcome on the investments allocated (Rosenbush et al., 2011). Rather, success is dependent on implementing an innovation process. This task, however, is rather complex because usually firms have limitations in term of financial, human and technological resources (Gunday et al., 2011) and they need to deal with these constraints in their innovation strategies. Moreover, there are different types of innovations and each has different impacts on organization performance (Walker, 2004). For example, Subramanian and Nilakanta (1996) claim that product and process innovations are externally focused because they are designed to make the organization more competitive in the market, thus affect the effectiveness of the firm. On the other hand, organizational innovations (e.g. managerial innovations) affect the rules, the procedures and the structures of the organization and therefore influence the organizational efficiency (Subramanian and Nilakanta, 1996). Moreover, this type of innovation may represent the breeding ground for more innovations (Gunday et al., 2011).

All these issues need to be taken into account when exploring the relationship between innovation and performance. Nevertheless, the same concept of innovation is not very clear in literature because it is broad and heterogeneous in its definitions and it is characterized by a lack of general consensus on the right measurement of it (Madrid-Guijarro et al., 2013) and on the classification typologies (Gunday et al., 2011). This confusion makes it more difficult to empirically analyze the phenomenon of innovation and to study its effects on organizations' performance. As result, there is a great deal of methodologies and indicators that are employed to test this linkage. Consequently, addressing these topics requires a general

awareness of the limited effectiveness of measurement practices in tapping the multidimensionality phenomenon of the organizational performance (Richard et al., 2009) and of the difficulty to seize the innovation initiatives of firms given its open nature and definition.

Moreover, when dealing with this issue for SMEs, the empirical researches are even less conclusive because the nature of the innovation in small and medium sized companies is usually informal and incremental (Rolfo and Calabrese, 2003) and they exhibit some features that the traditional indicators would not capture (Hall et al., 2009) like management and business practices or organizational characteristics that are firm specific (McKinsey, 2013).

In a report on the innovation and economic growth, McKinsey rates 16 developed countries on the base of the Innovation Capital which is a combined measure of physical, knowledge and human capitals. The last place is filled by Italy that shows little value on the innovation-related assets that are used to measure the productivity growth (McKinsey, 2013).

Also when looking to more traditional indicators like the R&D expenses, Italy ranks in bad positions. Indeed, typically the innovation investments in Italy are relatively low. For example, in 2008 the R&D expenses in relation to the GDP was 1.2 percent, compared to the EU average level (1.8 percent) and distant from the Germany level (2.6%) (Bugamelli et al., 2012). This might indicate the low innovativeness of Italian SMEs. However, it is possible that the real innovation effort carried out by Italian SMEs are distorted because small and medium sized companies are more likely to be engaged into informal innovation activities (Parisi et al, 2006). This can also partly be explained by the fact that, in Italy, a significant part of SMEs is composed by family firms. Family firms often lack sufficient organizational structure, resources and processes to professionally manage innovations. This raises an additional question whether this peculiar organizational ownership somewhat affects the innovation activity of the firms.

1.1 Research objective and research questions

The objective of the study is therefore to empirically test the relationship between the innovation activities and the organizational performance in Italian SMEs and test the innovativeness in light of the aforementioned arguments. More in details, the project consists of an examination of the direct effect of the innovation typologies on firm performance, and an investigation of the family character that can be an obstacle to innovation in small and medium sized companies. The thesis uses a subjective approach to measure the impact on firm of innovation and an input-output perspective in measuring the innovation activities that considers both the resources put into the innovation process and the short-term realized success of innovation activity (Suroso and Azis, 2015).

Therefore, this research paper focuses on the following research question:

Does innovation enhance the performance of Italian SMEs?

And the sub-questions that this thesis will try to answer are:

- **Are Italian SMEs innovative?**
- **Are particular types of innovation associated with higher levels of performance in Italian SMEs?**
- **Does the possession of the family character influence the innovation of Italian SMEs?**

The thesis will introduce the concept of innovation and its typologies and the wide range of its measurements with a focus on the innovation in SMEs, followed by an overview of the Italian SMEs. Coming up, the conceptual model and its hypotheses will be formulated. In the second part of the thesis, the methodology section will describe the sampling procedures, the collection and the data analysis plan. Finally, the results will be presented and discussed and the conclusions drawn in the last part.

The paper contributes to the empirical literature that has tried to measure the impact of innovation on performance. The significance of the thesis stems from the limitation of Italian empirical studies that address the relationship between Italian SMEs performance and innovation.

Chapter 2

Research Background and Hypotheses

2.1 Literature review

2.1.1 Innovation

While the importance of innovation is recognized, there is still a lack of consensus on the different types of innovation practices. Indeed, literature has defined innovation in plenty of ways and there is a confusion on its real nature (Olughor, 2015). For example, Maravelakis et al. (2006) classify innovation in product, process, and administrative innovations; Han et al. (1998) make a distinction between technical and administrative innovations; Salim and Sulaiman (2011) suggest as classifications the technological, the market and the administrative innovations.

Some famous definitions can be found in Schumpeter work (1912) who defines innovation as “New combinations of productive means”, or in the OSLO Manual (2005) where accompanied with the traditional product and process innovations that are linked with the technological changes in organizations, are the marketing innovation that is the implementation of changes in product placement, promotion or pricing; and the organizational innovation intended as changes of organizational methods in the firm’s business.

Another classification largely used is given by the European Commission (2003) that makes a distinction among production, process and management innovations. Accordingly, innovation is:

“the renewal and enlargement of the range of products and services and associated markets; the establishment of new methods of production, supply and distribution; the introduction in changes in management, work organization, and working conditions and skills of workforce”.

These definitions and classifications show that firm innovation is a multidimensional phenomenon (Subramanian and Nilakanta, 1996; Baregheh et al., 2009; Suroso and Azis, 2015) because it can be performed in numerous ways and depends on the firm’s resources, capabilities, strategies and position (Baregheh et al., 2009). Indeed, usually firms have

different levels of innovative capabilities and they might be simultaneously involved in several innovation activities at once and at different levels of implementation (Gunday et al., 2011).

On the basis of this review, it is clear that innovation is not a one-dimensional theoretical construct that can be identified with a single operational measure. As results, any attempt to assess innovative activities requires first adequate metrics (Hughes, 2001).

2.1.2 Measurement of innovation

About this issue, literature has recognized several determinants of the phenomenon and consequently its conceptualization in multidimensional constructs. In principle, many studies support the idea that R&D is the most crucial factor in the firm capacity to create innovation (Frenkel et al., 2001) and usually scholars use R&D or patents as its proxies (Huiban and Boushina, 1998).

Broadly speaking, there are two acknowledged approaches to the innovation measurement instruments: first, the *input and output measurement* and second, the *metric methodologies measurement* (Suroso & Azis, 2015). With the former, the innovation concept is measured with a combination of input and output indicators where input are the enablers of innovation like technological, human and intellectual capital; while output are the results of the innovation like patents and number of new products. Moreover, Suroso and Azis (2015) identify as critical issues of this kind of measurement instruments the limit that some input measurements do not capture the innovation process, that single measurements may overcome the qualitative value or the economic value of the innovation, and the lack of information of the technological complexity in the input used. On the other side, the second stream of innovation measurement is based on metric and methodologies built on surveys, mathematical models and balance scorecards that can hugely vary upon organizations making more difficult any comparison. Indeed, the main limit of this stream of study is the lack of a shared conceptual framework to measure innovation.

However, independently from the approach used, many determinants can explain the innovation activities of the organization and represent good predictors for them. The point is to reproduce the multidimensional nature of the concept in its measurements.

At the same time, the different measurement instruments are strictly linked with the angle from which the phenomenon is observed. Hughes in his study (2001) underlines that there are two methods to look at the innovation phenomenon: the objective and the subjective approach. The first focuses on the outputs of the innovation and on the direct analysis of innovative processes or products. The second is based on the organization's own perception of its innovation activity. This latter has some advantage because it can incorporate the less tangible features of the innovation like the organizational culture and the personal characteristics or attitudes inside the company, that are factors counted as relevant in the innovation process in several studies (Miron et al., 2004; Patterson et al., 2005).

2.1.3 Innovation and performance

One of the research area in the innovation literature aims to find out the relationship between innovation and organizational performance (Gunday et al., 2011). There are indeed many studies on this topic. For example, Serna et al. (2016) suggest that better levels of innovation impact in a positive way the organizational performance in Mexican companies; other scholars come to the same conclusions for Malaysian enterprises (Salim and Sulaiman, 2011); for Nigerian firms (Olughor, 2015); for the Turkish ones (Gunday et al., 2011) or for Israelian firms (Shefer and Frenkel, 2005). On the contrary, other studies like Damanpour and Evan (1990), Terziovski (2010) and Heunks (1998) are less conclusive on the issue because they do not find support for an effect of innovative capabilities on SMEs performance

Some scholars contribute to the existing literature providing some additional insights on this relationship. Madrid-Guijarro et al. (2013) investigating the innovation in Spanish SMEs during different economic conditions stress that innovation is positively associated with firm performance independently from the economic downturn; Calantone et al. (2002) find that

this relation depends on the full understanding by the firm of customer needs, of the technology development and of competitors' actions.

However, in general, these studies focus on the relationship between product or process innovations and financial results excluding any other organizational effect (Gunday et al., 2011). Besides, this choice is explained by the scarce consistency in literature of the organizational performance definitions and its measurement (Richard et al., 2009).

Indeed, in their analysis, Richard et al. (2009) review the measurement of performance used in management literature and find 207 different measures further complicated by different usage of single, multiple or aggregated constructs. Moreover, they stress as limit of many of them, the absence of methodological consistency and of clarity in the theoretical definition of the constructs used for these studies. For example, there is a confusion between the concept of Organizational performance and the Organizational effectiveness. Indeed, the former can be intended as the achievement of the profitability goals and of the strategic objectives of the organization (Hult et al., 2004) and it is a concept that encompasses three areas of the firm outcomes, namely financial performance, product market performance and shareholder return (Richard et al., 2009). Intended as organizational performance, the availability of measures that can be employed to measure the phenomenon are numerous and the most commonly used are the growth in sales turnover and the employment growth (Freel, 2000), the rate of return on sales and the rate of growth in sales (Geroski and Machin, 1992), the return on equity and the return on assets (Madrid-Guijarro et al., 2013). On the other side, the organizational effectiveness is a broader concept and includes several internal and external outcomes such as the effectiveness of the internal operation and the corporate social responsibility (Richard et al., 2009). A model validated by some researches based on this concept and used to empirically test the relationship between the firm performance and the innovation (Van Auken et al., 2008; Gálvez Albarracín and García Pérez De Lema, 2012; Madrid-Guijarro et al., 2013; Guzmán et al., 2009) is the Quinn and Rohrbaugh model (1983) of the organizational effectiveness that considers the performance of the firm from four perspectives representing the required balance that every organization must maintain among flexibility and control and between internal and external perspectives.

In general, all the measures mentioned are methodologically unquestionable but may result of difficult availability in the collection stage of empirical analysis. For this reason, some authors underline the need to include in the performance evaluation some subjective criteria, also considering that the objective ones are short-term oriented and are not risk adjusted (Van Auken et al., 2008; Madrid-Guijarro et al., 2013). Therefore, a subjective approach can be used to better measure the performance outcomes of the organization, whose main advantage is to allow the researchers to address latent performance constructs.

2.1.4 The structure and strategy of SMEs and innovation

Many studies dig deeper the organizational structure and characteristics of SMEs and the influence over their innovativeness. For example, some scholars underline the peculiarity of SMEs like the flexibility, the low degree of formalization and the quick decision making process that make them better positioned in their innovative capacity (Vossen, 1998). On the contrary, alternative empirical evidences support the idea that formal structures along with an innovation strategy are good predictors for the success of SMEs (Terziovski, 2010; Prakash and Gupta, 2008).

Other academics warn the necessity to make a distinction based on the technological level of the organization because innovation activity is fundamental for high-tech organizations in coping with complex technological problems and consequently in their needs to invest in R&D and in high-skilled people, while for traditional industries the technological advancement and the accompanied investments may be less relevant (Frenkel et al., 2001).

With regard to the size of the firm, the relationship between the firm dimension and the innovation is unclear (Heunks, 1998) although some scholars find a significant effect on the innovation rate linked with the dimension of the firm (Heunks, 1998; Subramanian and Nilakanta, 1996). Indeed, it is believed that larger organizations have greater resources for investments in innovation comparing to the small-sized counterparts (Subramanian and Nilakanta, 1996). Similarly, the age factor shows some uncertainties because younger SMEs appear more innovative compared to older firms (Withers et al., 2011), but at the same time,

medium sized companies are more likely to be innovative when they are old compared to their younger counterparts (Lee and Ging, 2007).

About the family character of the firm, typically associated with SMEs, the unique combination of economic and non-economic goals affects their strategic behavior. Indeed, it has been found that their level of innovation investments is below the level associated with non-family companies because these investments, especially R&D expenses are costs with uncertain payoffs, and given their conservative nature, they may prefer limited investments in innovation activities or invest in less risky expenditures (Classen et al., 2014).

Likewise, the international orientation is considered relevant for the innovation activities of SMEs. In fact, it has been discovered that firms with a high engagement in foreign activities show better innovation performance and solid financial results because this commitment to international markets increases firm propensity to innovate and may enforce the availability of external sources of knowledge that can be transferred back through firms' collaborations (Castellani and Zanfei, 2007).

Strategic choices can also result beneficial for small and medium sized firms. Rosenbuch et al. (2011) in their meta-analysis of the relationship between innovation and SMEs performance acknowledge the role of innovation orientation and innovation activities as source of their competitive advantage. They stress that focusing exclusively on delivering innovative offerings is detrimental for SMEs because it avoids the exploitation of additional benefits that can derive from properly exploring, developing and communicating with the innovation orientation that ultimately can strengthen the internal culture, the goals set within the organization framework, but also the external perception by customers or competitors. Moreover, it can increase the brand equity or the possibility to gain high-quality partners for collaborations. In other words, as an organization, they need to be market oriented, intended as the ability to understand the market environment and use the knowledge to guide its own actions in the best way (Vorhies and Morgan, 2005). This orientation is a dimension of the firm's culture and its indicators are symbols, values and business approaches that are focused on market (Hult et al., 2004). According to literature, SMEs can benefit from their condition in performing a

market oriented strategy because they are usually closer to customers and able to exploit their needs and desires in a better way. Moreover, they can implement marketing plans faster because usually these organizations are less structured in formal layers. Finally, they can transfer customer intelligence quicker to the business activities (Keskin, 2006). Consequently, the market orientation can play an important role in the innovative capabilities of SMEs and its effect on organizations should be taken into account.

2.1.5 Italian SMEs and innovation

The most recent data of the Italian National Institute of Statistics (ISTAT) on the Italian Firm Population are dated 2012 and clearly show the absolute relevance of SMEs for the Italian economy (Table 2.1). Undeniably, the micro-enterprises account for 95.2% of the total Italian firm population made of 4.4 million companies. The small sized firms account for 4.2 % and the medium sized for only 0.5% of the total Italian firms. Moreover, SMEs represent near the 80 % of the total employment and the 67.3 % of the Italian added-value.

Table 2.1: Italian Firm Statistics (2012)

		Micro enterprises (1 to 9)	Small enterprises (10 to 49)	Medium enterprises (50 to 249)	SMEs
Number of enterprises	of	4,299,730	187,514	21,606	4,438,850
Share		95.2%	4.2%	0.5%	99.9%
Number of employees	of	7,803,370	3,341,020	2,088,952	13,233,342
Share		46.7%	20.0%	12.5%	79.1%

The MET dataset (Monitoraggio Economia e Territorio) provides additional information on the industry and production services sectors. Excluding the self-employment firms, the number of enterprises in 2013 is 927,141. With regards to the sectors, the 51.8% of the firms are part of the production area, and the 48.2% belong to the service sector.

Geographically, the Italian economy can be divided into 5 macro regions: North-East, North-West, Centre, South, Islands and the majority of SMEs are located in the North areas (North-East: 23.4%; North-West:32.2%) or in the Centre (21.6%). The remaining is divided between the South (15.9%) and the Islands (6.9%). However, it should be pointed out that Italian SMEs

are usually organized in industrial districts, which are territorial areas with a huge amount of small enterprises specialized in a specific sector or industrial process (del Bufalo et al., 2015).

The modern composition of the Italian industrial system is the result of Italy's economic "miracle" of the 1960s and the industrial transformation of the following decades (Romagnoli A. and Romagnoli M., 2016). In particular, dynamic industrial districts in some sectors like furniture, machines, and textiles (usually export-oriented and focused on innovation) emerged as networks of SMEs in the 1970s and were the engine of the Italian economy for a long period (Romagnoli A. and Romagnoli M., 2016). The subsequent adoption of the Euro currency, the emerging of the China manufacturing firms and the slow implementation of ICT in the Italian firm caused the decline of the Italian industry during the 80s-90s (Turetta, 2016). In addition, the lack of adequate public policies and of investments threatened the Italian industrial structure in those years even more (del Bufalo et al., 2015). In recent times, Italy has been characterized by a strong recession during the years 2008-2013 that resulted in a production loss of 24% (Orazi, 2016). Only lately, the Italian economy has registered modest performance. The consequence of this long economic and financial downturns is the reduction in the number of firms by around 41% compared to the previous period¹(del Bufalo et al., 2015).

The Italian industrial system is often regarded as poor in innovation performance (Romagnoli A. and Romagnoli M., 2016). The MET dataset reports the investments by types of the Italian SMEs (Table 2.2). The majority of firms in the industry sector invested in machinery and limitedly in ICT technologies or employee education without any significant difference among the firm size. Whereas for the services' production firms, the investments are more evenly distributed between the machinery and ICT technologies investments.

¹ 637,729 less firm during the period 2008-2013

Table 2.2: Investments in Italian SMEs (2013)

	Micro enterprises (1 to 9)	Small enterprises (10 to 49)	Medium enterprises (50 to 249)
Industry			
Land and buildings	5.7%	9.4%	14.3%
Machinery	82.4%	84.9%	85.8%
ICT technologies	10.9%	18.9%	24.9%
Patents	0.6%	1.5%	2.6%
Employee education	2.5%	10.0%	10.8%
Energy saving investments	2.9%	9.7%	7.4%
Marketing and advertising	2.2%	5.7%	7.0%
Production services			
Land and buildings	5.8%	5.3%	9.5%
Machinery	54.3%	63.1%	62.4%
ICT technologies	45.0%	32.1%	32.8%
Patents	0.9%	1.3%	1.0%
Employee education	3.1%	10.6%	13.1%
Energy saving investments	0.9%	3.3%	3.8%
Marketing and advertising	3.4%	2.4%	3.1%

About the investments financing, the MET dataset shows the predominant source of self-financing for any investment followed by the medium-long terms debts or leasing. (Table 2.3). Worth noticing the low amount of Public credit facilities that reveal the poor policy support for innovation investments.

Table 2.3: Investment financing in Italian SMEs (2013)

	Micro enterprises (1 to 9)	Small enterprises (10 to 49)	Medium enterprises (50 to 249)
Self-financing	70.0%	52.9%	52.6%
Short term debts	5.7%	6.7%	5.9%
Medium-long term debts	11.5%	16.3%	17.2%
Recapitalization	0.2%	0.2%	0.3%
Leasing	9.0%	19.6%	15.9%
Public credit facilities	1.3%	2.6%	3.8%
Others	2.3%	1.7%	4.3%

Regard the types of innovation introduced, SMEs usually adopt product innovations comparing to process or organizational innovations (Table 2.4).

Table 2.4: Investment in innovation by types in Italian SMEs (2013)

	<i>Micro enterprises (1 to 9)</i>	<i>Small enterprises (10 to 49)</i>	<i>Medium enterprises (50 to 249)</i>
<i>Share of firms introducing product innovation</i>			
<i>Total</i>	8.7%	18.9%	27.5%
<i>Industry</i>	10.6%	21.5%	31.2%
<i>Production services</i>	7.2%	10.6%	16.8%
<i>Share of firms introducing process innovation</i>			
<i>Total</i>	5.4%	13.8%	21.5%
<i>Industry</i>	6.1%	15.9%	23.9%
<i>Production services</i>	4.9%	7.2%	14.3%
<i>Share of firms introducing organizational innovation</i>			
<i>Total</i>	6.1%	13.1%	21.9%
<i>Industry</i>	5.1%	13.1%	21.8%
<i>Production services</i>	6.9%	13.2%	22.4%

Literature has explored the Italian industry characteristics and studied the obstacles and the limits to innovation. Escoffier et al. (2011) identify some factors that represent the real obstacles to innovation diffusion in the Italian SMEs. These are the lack of innovative managing skills, the lack of financial and human resources as well as the difficult accessibility to financing and to basic research.

On the other hand, Rolfo and Calabrese (2003) list as obstacles the difficult external relationship because SMEs are usually closed to external parties; the low number of graduates in specific roles like engineers and the relatively little important by the entrepreneurs to innovative practices.

Del Bufalo et al. (2015) stress that the low productivity is linked with the low level of R&D investments in Italian SMEs and Hall et al. (2009) in their empirical analysis on innovation in the Italian enterprises find that R&D investments, and investments in equipment facilitates innovation, which in turn positively impact the performance of firms. Moreover, they underline that smaller and family-controlled firms are likely to be affected by credit rationing problems and they might have different goals from the growth or the profitability, such as the control of the firms (Cucculelli, 2007).

Bugamelli et al. (2012) link the size of Italian firms with innovation and recognize that the innovation propensity is higher among firms bigger in size. Moreover, they acknowledge that family-owned companies are likely to be more risk-averse and consequently they are likely to

be conservative in their innovation initiatives, especially as regards alternative management practices.

Pellegrino et al. (2012) show that young Italian SMEs rely on external sources of innovation rather than investing in R&D. Also Bugamelli et al. (2012) support this idea, demonstrating that the R&D investments are more likely to be implemented in older companies.

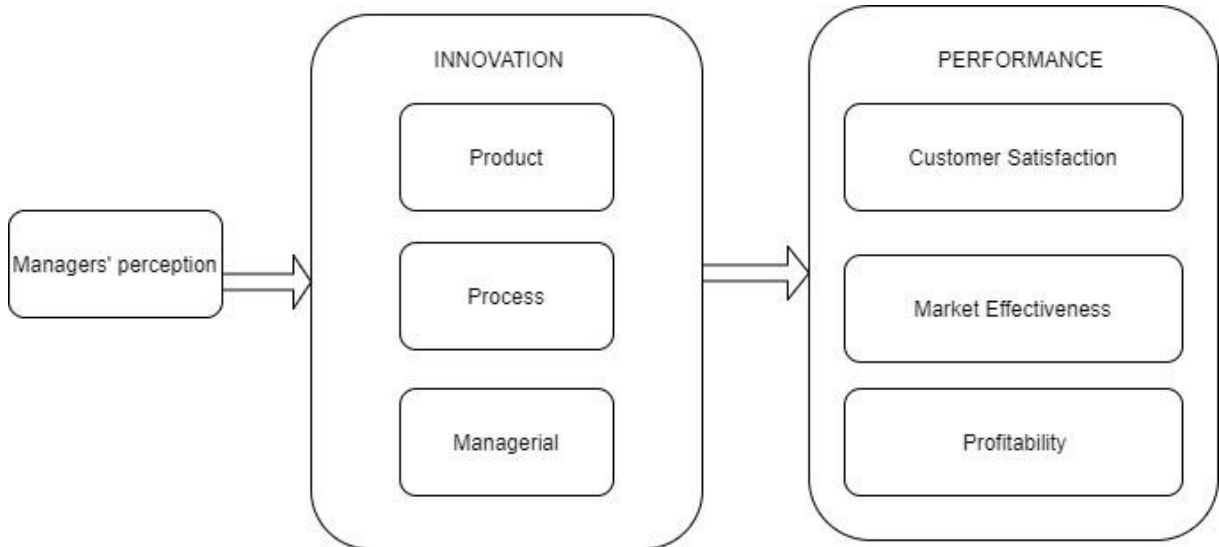
Castellani and Zanfei (2007) document that in general, Italian exporters or firms with any international activity, are more innovative than domestic SMEs.

2.2 Conceptual Framework

In order to conduct the empirical analysis, an adaptation of the model proposed by Van Auken et al. (2008), developed to measure the innovation and SMEs performance relationship in Spanish manufacturing firms has been adopted. There are several reasons why the aforementioned conceptual model is reproduced in this thesis. Firstly, it is based on a subjective perspective. Indeed, it relates the managers' perceptions to the innovation practices and to the organizational performance and it overcomes possible unwillingness of respondents to provide sensitive information as the investment amount or the financial outcomes. Secondly, since innovation in SMEs has usually some other channels that are not captured by the traditional indicators like the R&D expenses or patents (Hall et al., 2009), an input/output approach to innovation like this suits better the peculiarity of SMEs. Indeed, the innovative activities in small or medium enterprises are usually carried-out in an unstructured way through imitative or incremental process where learning by doing is the main factor (Rolfo and Calabrese, 2003) and this seems to be demonstrated for the Italian SMEs too (Romagnoli A., and Romagnoli M., 2016). Moreover, the adoption of a subjective approach to the input-output measurement gets through some of the limits identified by Suroso and Azis (2015) for these instruments, such as the qualitative evaluation of the innovation practices. Finally, the Italian and Spanish productive structures are both characterized by the prevailing presence of small enterprises (Carnazza, 2011). Accordingly, reproducing a model tested in a similar context with the required adjustments can reinforce the findings of the empirical research.

As follows the conceptual model (Figure 2.1):

Figure 2.1: The conceptual model



The concept of innovation has been largely treated in the previous part. The typologies, taken from Van Auken et al. (2008), are based on the definition provided by the European Commission (Com, 2003). These are the product innovation, the process innovation and the managerial innovation. More in details:

Product innovation is intended as the creation of a new or improved good or service (Suroso and Azis, 2015). Where for new is intended a product/service whose characteristics differ significantly from those of previously products/services. They can be based on new technologies, the application of new knowledge or can derived from the combination of new and existing technologies (Oslo Manual, 2005). Whereas, improved goods or services mean the enhancement (in terms of better performance or lower costs) of existing products/services whose performance has been significantly improved or upgraded through the use of higher-performance components or materials (Oslo Manual, 2005).

Process innovation is the improvement of the effectiveness and efficiency of production (Prajogo and Sohail, 2003). It consists in the adoption of technologically new or improved

production methods, including methods of product delivery, changes in production organization, in equipment, or in the usage of new knowledge (Oslo Manual, 2005).

Managerial innovation or **system innovation** is the change in the organizational structure and in the administrative process. It includes the introduction of significant changes in the organizational structures, the implementation of advanced management techniques, the implementation of new or substantially changed corporate strategic orientations (Oslo Manual, 2005).

The construct used for measuring the performance is adapted from Vorhies and Morgan (2005) that measure the organizational performance through two specific areas of the organization outcomes: the financial performance (profitability) and the market performance (customer satisfaction and market effectiveness). Where:

Profitability is the company combination of the sales performance with the associated costs that will determine the financial performance outcomes in terms of profitability and revenues (Morgan et al., 2002).

Market effectiveness is intended as the degree to which the desired market-based goals are achieved (Vorhies and Morgan, 2005). It is the result of the customer behavior, in terms of unit sales and sales revenues; and of the market performance from a competitors' perspective in terms of market share or sales growth indicators (Morgan et al., 2002).

Customer satisfaction is broadly defined as the chain of relationships that precedes and follows the customer satisfaction and includes the fulfillment of needs, the expectations, the perceived quality and the perceived value, but also the customer voice and the customer loyalty (Fornell et al., 1996).

2.3 Hypotheses

Some researchers find out that a peculiar trait of the Italian entrepreneurs is the limited importance they give to innovation (Rolfo, 2000). As recognized by Orazi (2016), Italian organizations usually perform poorly in terms of innovation compared with their European

counterparts. Indeed, according to official statistics, the average level of R&D expenses is below the average European level. However, the innovation activities cannot be exclusively measured with this kind of factors. As some researches (Rolfo and Calabrese, 2003) state, the innovation in SMEs is usually characterized by informal processes of incremental nature that are not solely associated with the investments in R&D and the number of patents produced. Therefore, considering the model presented in the thesis, based on a subjective measurement of the innovation activities including both input and output factors it is expected that the average level of each type of innovation activity in Italy is low. Consequently, the hypothesis to test is:

H₁: The average innovativeness of Italian SMEs is low

There are many empirical studies that analyze the relationship between SMEs' performance and innovation using several methodologies (Salim and Sulaiman, 2011), (Olughor, 2015), (Torres et al., 2015); also on an Italian level (Hall, et al., 2009), (Parisi et. al, 2006). The majority of them supports a positive link between these variables. However, as stated by Rosenbush et al. (2011), the innovation-performance relationship is usually context dependent because it can be effected by the cultural environment, the age of the firm or by the different innovation strategies adopted. Considering these statements, the next hypothesis follows:

H₂: More innovative Italian SMEs are also more performing

As stressed by Gunday et al. (2011), in literature there is not a commonly accepted assumption whether a specific type of innovation plays a greater impact on the firm performance. However, according to them and other researches (Yeh-Yuh Lin and Yi-Ching Chen, 2007) organizational innovations is the most important type of innovation in affecting the organizational performance. On the contrary, Hall et al. (2009) in their study on the innovation and productivity in Italian SMEs found a significant positive impact of product and process innovation on firm performance stressing the larger effect of process innovation between the two types. Also Heunks (1998) acknowledges the process innovation as the most important innovation type on performance, emphasizing how only process innovation stimulates productivity.

In the light of the above discussion, the following hypotheses are presented:

H_{3.1}: The higher the level of product innovation in Italian SMEs, the greater the firm performance

H_{3.2}: The higher the level of process innovation in Italian SMEs, the greater the firm performance

H_{3.3}: The higher the level of managerial innovation in Italian SMEs, the greater the firm performance

Innovation capability is acknowledged as one of the most crucial factor for firms and more specifically for SMEs performance. However, the number of studies exploring the nature of this relationship is still not sufficient because the literature does not provide a unique response in terms of its magnitude (Hall et al., 2009). Moreover, as specified by Gunday et al. (2011), innovations typologies adopted by the organization influence each other and they need to be implemented in combination because for example some types of innovation can play the role of facilitators for the others, or they can create the suitable inner environment for the other types of innovation. Consequently, the performance of the company might achieve better results when complementary innovations are adopted. Therefore, it can be hypothesized:

H₄: The higher the innovation in Italian SMEs, the greater the firm performance

For the Italian context, there is a scarcity of empirical studies about the innovation and family firms and the few available (Cassia et al., 2011; 2012) are not generalizable. Based on the R&D investments of non-family owned business in Italy, the innovativeness of family firms is 14.4 % lower than non-family businesses² (Bugamelli et. al, 2012). Even though these data are partial because they do not diversify for innovation type and might overcome some organizational characteristics such as shared family values, they are in line with general findings of recent studies on innovation in family SMEs (Cassia et al., 2012). For example,

² During the years 2007-09

Bennedsen and Foss (2015), highlight the lower propensity toward innovation in family firms attributable to their traditions and to their risk aversion (de Massis et al., 2015).

A possible explanation of these findings is that only few firms are able to exploit their family assets to drive innovation performance, whereas most stay loyal to traditional production structures and stakeholders undermining innovation (Bennedsen and Foss, 2015). Therefore, the following hypothesis is formulated:

H₅: Family-owned SMEs are less innovative (with regard to product, process, and management innovation) than non-family owned SMEs.

Chapter 3

Methodology

In order to empirically explore the relationship between the Italian SMEs performance and innovation, a questionnaire was developed and a survey was conducted. More in details, the process started with the definition of the questionnaire and the selection of the associated items and scales. It followed the choice of the sample technique and of the sample size. It ended with the electronic distribution of the questionnaire in the collection phase and with the data analysis plan.

3.1 Questionnaire

The instrument used to conduct this study was a questionnaire based on structured questions that were pre-specified in the response alternatives and in the response format; and on a final open-ended question in which participants could answer in their own words.

More in details, the questionnaire consisted of four parts. Part one introduced the questionnaire with some general multiple-choice questions where respondents were asked to provide some initial information on their firm. The second part included two groups of questions on the firm performance and the firm innovativeness. To follow, the next part dealt with some multiple-choice questions, dichotomous questions and scales questions to dig deeper the company framework. Finally, a closing unstructured question enabled the participant to express their opinion on the survey or issues not covered in the questionnaire. Moreover, a proper introduction that shortly disclosed the purpose of the research and comprised a courteous note was included as questionnaire introduction.

The reason why the questionnaire was chosen, it is the relatively simplicity in the design of the instrument and in the ease of distribution. However, should be noted that the results derived from this instrument depend on the way questions are formulated because any doubts the respondents might have cannot be clarified.

Moreover, because of the purpose of the research, the questionnaire and the accompanied scales were translated from English to Italian, and the consistency with the original measurements was checked to avoid any misinterpretations. Next, the Italian questionnaire was recreated with the electronic survey design system *Qualtrics* that facilitated both the preparation of the questionnaire and its distribution.

In Appendices A and B are the English and the Italian version of the Questionnaire.

3.2 Measurement

Items in the questionnaire were developed based on the literature review related to the constructs (innovation and performance). As it is acknowledged in the literature review, there are several measurement scales that are used to operationalize the constructs used in this study and the reason for selecting a scale is typically related to the type of data to collect. For example, a 5-point or 7-point scale can be used to measure attitudinal variables, whereas nominal scales suit better for categorizing individuals or objects into groups.

With regards to the performance construct, on the words of Subramian and Nilakanta (1996), there are no guidelines available to help researchers choose the best measures of the organizational performance generated by innovation. However, they propose to look at the performance as a dichotomy of efficiency and effectiveness. More in details, the efficiency measures have a cost-benefit focus and include financial ratios such as ROA, and ROI. The effectiveness measures have a revenue generation focus and can be measured by market indicators. Accordingly, the performance construct used in the conceptual model was based on the items identified by Vorhies and Morgan (2005) that propose a three-approaches perspective on the performance of companies based on Customer satisfaction, Market effectiveness and Current profitability using a 7-point scale. The choice of this scale was due to the combination of financial (current profitability) and non-financial indicators (market effectiveness and customer satisfaction) to measure the firm performance with a subjective perspective where the respondents were asked to compare their firm to their main competitors on these indicators. Moreover, one additional reason of this choice was because

of the little clarity in the theoretical definition of the performance construct used by Van Auken et al. (2008) that is based on an organizational effectiveness model. Moreover, it is to mention that the scale was adapted to a 5-point scale for homogenizing the scales between the two constructs used for the empirical analysis.

The innovation construct was measured with the definitions and the measurement scales of innovation provided by Van Auken et al. (2008). According to them, innovation is operationalized in product innovation, process innovation and management innovation. Also for this scale a subjective approach was used and the innovation practices of the firm were compared with the main competitors' innovation performance. The items were measured on a 5-point scale.

Several control variables or additional variables were included in the analysis in order to control and study the effect of organizational structure and environmental influences: the *industry sector* and *subsectors* operationalized with the International standard industrial classification of all economic activities provided by the Eurostat; the *age of the firm*, calculated as the number of years from its foundation; the firm size, operationalized with the number of employees; the *innovation importance* in the firm and its *innovation rating* calculated with a rating score of both items; the *firm position*, which measurement scale, in line with Cavusgil and Zou (1994), was a rating scale with bipolar labels at the ends; the *firm ownership*, operationalized with a dummy variable for whether the firm is a family-run business or not; the *technological level*, operationalized in accordance with van Auken et al. (2008) with a dummy variable for whether the firm had an medium-high or high level of technology intensity or if it had a medium-low or low technology level; the *internationalization of the firm* operationalized with a dummy variable for whether the firm was international oriented or not and the *international activities* calculated with the categories for the international activities defined by the Eurobarometer. Finally, the *respondent position* was nominally scaled with several category labels provided by the EU Business Climate Survey. All these variables were tapped by direct single questions. The table 3.1 provides more information on the items and scales used for each construct and variable.

Table 3.1: Measurement scales

Construct (based on or adapted from)	Items	Scale
Performance (Vorhies and Morgan, 2005)	<p>Please indicate the number below that express the business performance of your company during the last year in relation to your competitors:</p> <p>Customer satisfaction</p> <ul style="list-style-type: none"> ○ Overall customer satisfaction ○ Delivering value to your customers ○ Delivering what your customers want ○ Retaining valued customers <p>Market effectiveness</p> <ul style="list-style-type: none"> ○ Market share growth relative to competitors ○ Growth in sales revenue ○ Acquiring new customers ○ Increasing sales to existing customers <p>Current profitability</p> <ul style="list-style-type: none"> ○ Business profitability ○ Return on investment (ROI) ○ Return on sales (ROS) ○ Reaching financial goals 	5-point interval scale ranging from not competitive=1 to very competitive=5
Innovation (Van Auken et al., 2007)	<p>Please indicate the number below that express the position of your company in relation to competitors:</p> <p>Product innovation</p> <ul style="list-style-type: none"> ○ Number of new or modified products (services) introduced per year ○ Entrepreneurial character of the company when introducing new products (services) ○ Speed of new products (services) introduced ○ R&D investment in new products (services) <p>Process innovation</p> <ul style="list-style-type: none"> ○ Number of modifications in processes introduced per year ○ Entrepreneurial character of the company when introducing new processes ○ Speed of new processes introduced ○ R&D investment in new processes <p>Managerial and system innovation</p> <ul style="list-style-type: none"> ○ Number of changes in the managerial systems ○ Novelty of company's managerial systems ○ Search by company executives for new managerial systems ○ Entrepreneurial character of the company when introducing new managerial systems 	5-point interval scale ranging from not competitive=1 to very competitive=5
Industry (NACE rev.2)	Which is the sector of your company?	Nominal scale with 21 categories
Industry sub-sector (NACE rev.2)	Which is the sub-sector of your company?	Nominal scale with 98 categories
Firm age	indicate the age of your firm in years from its foundation	Nominal scale with 6 categories
Firm size	Which is the number of your company's employees?	Nominal scale with 5 categories
Innovation importance	How important is innovation for your company?	5-point interval scale ranging from not competitive=1 to very competitive=5
Innovation rating	How do you rate your company on innovation?	5-point interval scale ranging from not innovative=1 to very innovative=5
Firm position (Cavusgil and Zou, 1994)	What is your firm's relative position in the industry?	5-point semantic differential scale with the end points associated with the labels "Minor" and "Dominant"
Technological level (Van Auken et al., 2008)	Which is the technological level of you firm?	Nominal scale with dichotomous categories
Firm Ownership	Is it your company a family-run business	Nominal scale with dichotomous categories
Internationalization	Does your firm have international activities abroad	Nominal scale with dichotomous categories
International activities (Internationalization Eurobarometer)	Which kind of (international) activity?	Nominal scale with 7 categories
Respondent position (EU Business Climate Survey)	Please specify your current position within the company	Nominal scale with 9 categories

3.3 Sample

The target population was defined as Italian SMEs, according to the European classification of Small and Medium sized enterprises, which includes firms with less than 250 employees and a turnover below €50 million (EU Commission, 2012). The next stage was the definition of the sampling frame that can vary from the target population because of the research limits and the data collection methods employed. For this study, the sampling frame was derived from the Amadeus – Bureau van Dijk database that contains the financial data of approximately 3 million European companies with a turnover greater than € 1 million.

The selection criteria for screening the large amount of data from this database were the country selection (Italy), the number of employees (maximum 250), and the operating revenue (turnover) at a level below € 50million (based on the last available data). Finally, a further criterion was the contact information availability (email addresses) for these companies that were used for the electronic distribution of the questionnaire. The final sample frame consisted of 32,911 firms.

The sampling procedure adopted was the simple random technique, where every element in the population had an equal and known chance of being selected as subject.

The reason for this choice was that it has the least bias and the most generalizability among the sampling designs. However, it should be noted as main disadvantage of this sampling procedure, the minor efficiency compared with the other probability sampling techniques.

The second aspect of the sampling design issue was the sample size. This choice was determined by considerations pertaining the types of sampling plan used, by the extent of precision desired namely the confidence interval and by the acceptable risk in predicting the precision level selected (confidence level). These two latter, are important to make the sample statistics reliable estimates and the closest to the population parameters within a narrow margin of error. In accordance with all these considerations, the proposed sample size was 150 SMEs.

3.4 Data Collection Process

The data collection process consisted of two phases. The first one was a checking procedure of the draft questionnaire by 10 fellow students to identify any problem with the questionnaire in the format and in wordings. This procedure also assessed the precision of the language translation and the consistency with the original constructs used for the subsequent stage. The second phase consisted of the effective administration of the questionnaire and the collection of the data. As mentioned, the *Qualtrics* software provided a distribution module which allowed the creation of a sample (randomly selected from the contact list) and the usage of the Qualtrics Mailer to send a unique survey link to each contact. Consequently, the survey was distributed through an email invitation to take part in the survey to 5000 SMEs presented in the contact list. This choice was due to considerations pertained to the low response rate expected and the limited period of time for the distribution and the collection of the data.

3.5 Analysis presentation

The descriptive statistics provided a profile of the sample under study reported in frequency of responses for each variable including information like the sector and subsector, and the respondents' position within the organization.

One sample t-test was adopted to test whether the population mean respects an established innovation level calculated as the mean value of the three innovation typologies (Hypothesis 1). The cut-off value set was 3.0 measured on the 5-point scale used for the innovation construct.

Independent samples t-test was employed to assess whether innovative firms were also more performing. The cut-point for defining the groups was an innovation level of 3.0. According to this criteria, the analysis compared the performance means of two alternative groups.

Multiple regression analysis tested the hypotheses regarding the relationship between the innovation typologies and the firm performance (Hypotheses 3). The models used to analyze

this relationship were the same adopted by Van Auken et al. (2008), applied in many other empirical studies with some minor changes (Madrid-Guijarro et al., 2009; Gálvez Albarracín and García Pérez De Lema, 2012). More in details, the models proposed were:

$$Y_i = b_0 + b_1 Age_i + b_2 Size_i + b_3 TL_i + b_4 PI_i + \varepsilon_i$$

$$Y_i = b_0 + b_1 Age_i + b_2 Size_i + b_3 TL_i + b_4 PRI_i + \varepsilon_i$$

$$Y_i = b_0 + b_1 Age_i + b_2 Size_i + b_3 TL_i + b_4 MI_i + \varepsilon_i$$

Where:

Y_i = SME performance

Age_i = number of years the firm is in operation (dummy variable 1: greater than or equal to 16; 0: less than or equal to 15)

$Size_i$ = firm size (dummy variable 1: greater than or equal to 11; 0: less than or equal to 10)

TL_i = firm technological level (dummy variable 1: high/medium; 0: low/medium)

PI_i = Innovation of the company relative to the product

PRI_i = Innovation of company relative to the process

MI_i = Innovation of company relative to systems and managerial issues.

Whereas, to test the hypothesis 4, the dependent variable (Innovation) was considered in aggregate, calculated in the same way as before. More in details the model was:

$$Y_i = b_0 + b_1 Age_i + b_2 Size_i + b_3 TL_i + b_4 I_i + \varepsilon_i$$

Where:

Y_i = SME performance

Age_i = number of years the firm is in operation (dummy variable 1: greater than or equal to 16; 0: less than or equal to 15)

$Size_i$ = firm size firm size (dummy variable 1:greater than or equal to 11; 0: less than or equal to 10)

TL_i = firm technological level (1: high/medium; 0: low/medium)

I_i = Innovation of the company

Finally, Independent t-test was used to evaluate whether the family firms were more or less innovative than non-family firms (Hypothesis 5). The innovation variable (for each type) was the test variable and was intended as the mean ratings score of innovation activities (broken down by type). Regarding the independent variable, the groups identified were as follows:

- *Family Character*: (Group 1= Family-run business; Group 2= Non family-run business)

The next table (Table 3.2) summarizes the objective of each research hypothesis, the statistical techniques with the accompanied statistical hypothesis and the reasons for those choices.

Table 3.2: The Analysis

Objectives	Research Hypotheses	Statistical techniques	Statistical Hypotheses	Reasons
To determine if Italian SMEs are innovative	The average innovativeness of Italian SMEs is low	One Sample t-Test	<p>$H_0: \mu_{\text{Innovation}} = 3.0$ (The mean innovation value of the sample is equal to 3.0)</p> <p>$H_1: \mu_{\text{Innovation}} \neq 3.0$ (The mean innovation value of the sample is not equal to 3.0)</p>	One sample t-test is adopted to test whether the sample mean respects a given value
To determine if more innovative firms get better results in their performances	H₂ : More innovative firms are more performing	Independent samples t-test	<p>$H_0: \text{Performance (group1)} = \text{Performance (group2)}$</p> <p>$H_1: \text{The two groups differ in terms of Performance}$</p> <p>Grouping variable: Innovation with 3.0 as cut point</p>	Independent t-Test can be used to examine whether there is a significant difference in the mean for two groups with regard to a test variable
To analyze how the firm performance is influenced by the innovation practices of the firm	<p>H_{3,1}: The higher the level of product innovation in Italian SMEs, the greater the firm performance</p> <p>H_{3,2}: The higher the level of process innovation in Italian SMEs, the greater the firm performance</p> <p>H_{3,3}: The higher the level of managerial innovation in Italian SMEs, the greater the firm performance</p>	Regression analysis	<p>Two stages testing hypothesis (for each):</p> <p>1) $H_0: R^2=0$ $H_1: R^2 \neq 0$</p> <p>2) $H_0: b_i=0$ $H_1: b_i \neq 0$</p>	The regression analysis is used to develop a mathematical relationship between the interval scaled independent variables (Innovation typologies) and an interval-scaled dependent variable (firm performance).
To analyze how the firm performance is influenced by the innovation (intended on an aggregate level)	H₄ : The higher the innovation in Italian SMEs, the greater the firm performance	Regression analysis	<p>Two stages testing hypotheses:</p> <p>1) $H_0: R^2=0$ $H_1: R^2 \neq 0$</p> <p>2) $H_0: b_i=0$ $H_1: b_i \neq 0$</p>	The reason is the same than the previous hypothesis. The difference is the independent variable measured as a single variable
To determine if the family characteristic can facilitate or limit the innovation in Italian SMEs.	H_{5,1} : Family-owned SMEs are less innovative (with regard to product, process, and management innovation) than non-family owned SMEs	Independent samples t-test	<p>$H_0: \text{Innovation (group1)} = \text{Innovation (group2)}$</p> <p>$H_1: \text{The two groups differ in terms of innovation}$</p> <p>(Innovation intended for each type)</p>	Independent t-Test can be used to examine whether there is a significant difference in the mean for two groups with regard to a test variable

3.6 Reliability test

To test the reliability of the scale for multi-items constructs, the Cronbach's Alpha was calculated. The following table (Table 3.3) reproduces the coefficient for each dimension of the innovation and performance constructs. Commonly, reliabilities greater than 0.60 are accepted. Thus, the internal consistency reliability was considered to be acceptable in this analysis.

Table 3.3: Reliability Test

Scale	Number of items	Scale validation (Cronbach's α)
Product innovation	4	.880
Process innovation	4	.894
Management Innovation	4	.951
Customer satisfaction	4	.853
Market effectiveness	4	.900
Profitability	4	.930

3.7 Data entry and data preparation

After the collection of the data, some preliminary steps were required before running the analysis. Indeed, the data were entered into a database. For this project, the software used was SPSS that can directly import the data collected from the Qualtrics platform.

An additional step ahead the data analysis was getting the data ready for it. More in details, after a check of the data file with the respondents' answers, those questionnaires with significant omissions were excluded from the data set for the analysis. After, each variable was labelled. Next, some data transformation actions were implemented. For example, because more items were used for measuring a single concept, a mean score was calculated for each of them using the Compute function in SPSS. In addition, some dummy variables were created for the regression analyses or some variables were recorded as new variables with different values for the Independent sample t-test analyses.

3.8 Data collected

A number of 260 questionnaires were completed. However, because of consistent omissions (larger than 25% of all items in the questionnaire) 88 responses were excluded from the data analysis. Consequently, the final sample size was made of 172 SMEs.

The little response rate (lower than 5%) was explained by the short period time for the collection of the data and the period of collection corresponding to the summer holidays when many employees were out of offices. A different reason might have been the little incentive of the respondents to provide their own answers to the questionnaire.

Chapter 4

Analysis of the results

In this section the outputs of the questionnaires administered are presented, firstly with a descriptive analysis of the sample characteristics and of the sample responses. In the second part, the empirical analysis tests the hypotheses formulated in the previous chapters.

4.1 Descriptive statistics

Table 4.1 shows the industry sectors of the sample. The large majority of them operates in the manufacturing sector (53.49%) followed by the wholesale and retail trade sector³ (12.21%) and the other service activities sector (7.56%) which includes as main selection, the personal services activities (8 counts). To mention, some of the sectors did not receive any responds, however, given their limited presence in the Italian industry structure, their omission is not relevant.

Table 4.1: Which is the sector of your company?

SECTOR	%
AGRICULTURE, FORESTRY AND FISHING	2.91%
MINING AND QUARRYING	0.58%
MANUFACTURING	53.49%
ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	0.00%
WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES	0.00%
CONSTRUCTION	5.23%
WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	12.21%
TRANSPORTATION AND STORAGE	4.65%
ACCOMMODATION AND FOOD SERVICE ACTIVITIES	2.91%
INFORMATION AND COMMUNICATION	1.16%
FINANCIAL AND INSURANCE ACTIVITIES	0.58%
REAL ESTATE ACTIVITIES	0.00%
PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	4.65%
ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	1.16%
PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY	0.00%
EDUCATION	0.00%
HUMAN HEALTH AND SOCIAL WORK ACTIVITIES	1.16%
ARTS, ENTERTAINMENT AND RECREATION	1.16%
OTHER SERVICE ACTIVITIES	7.56%
ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE	0.00%
ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES	0.58%

³ This sector includes also the repair of motor vehicles and motorcycles

Regarding the subsectors, because of the volume of the responses and the variability in the industry, the manufacturing subsectors need some additional information. The predominant part of SMEs in the manufacturing sector that compose the sample are metal (15 counts), machinery and equipment (11 counts), textile (7 counts) and chemicals (6 counts) or rubber and plastic producers (6 counts). These mentioned, are among the most widespread SMEs' sectors in Italian industry.

The age of the sample is old (Figure 4.1). Indeed, quite all the elements are within the last age groups. More in details, the largest category is 21-50 (58.72%), followed by SMEs older than 50 years (31.98%).

Figure 4.1: Please, indicate the age of your firm in years from its foundation (n=172)

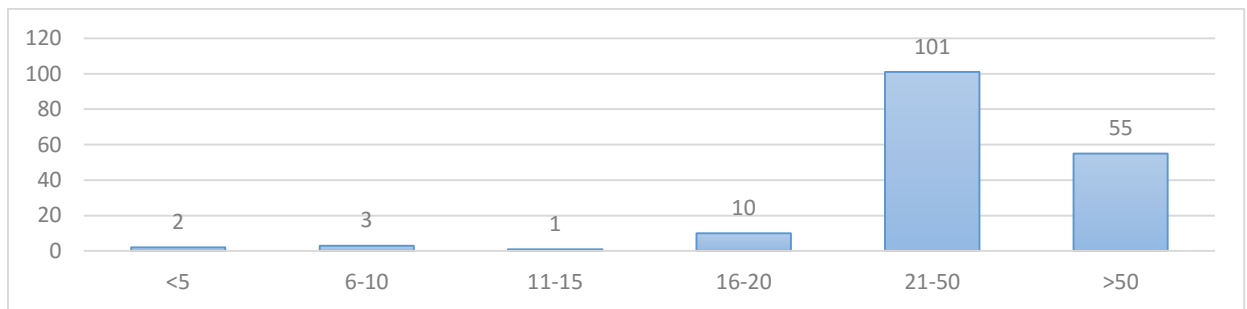
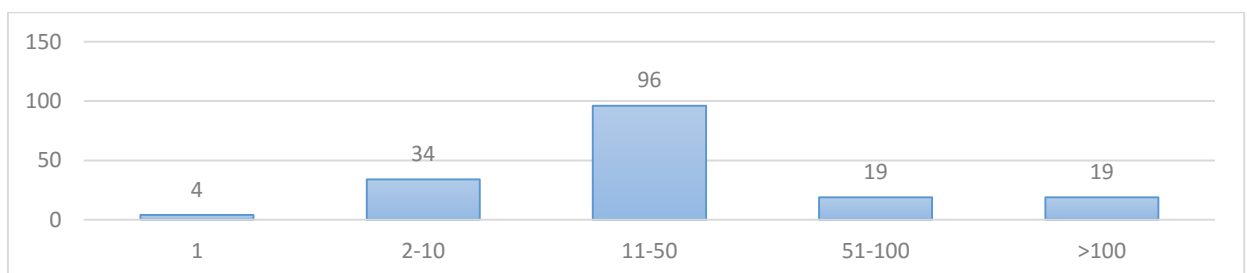


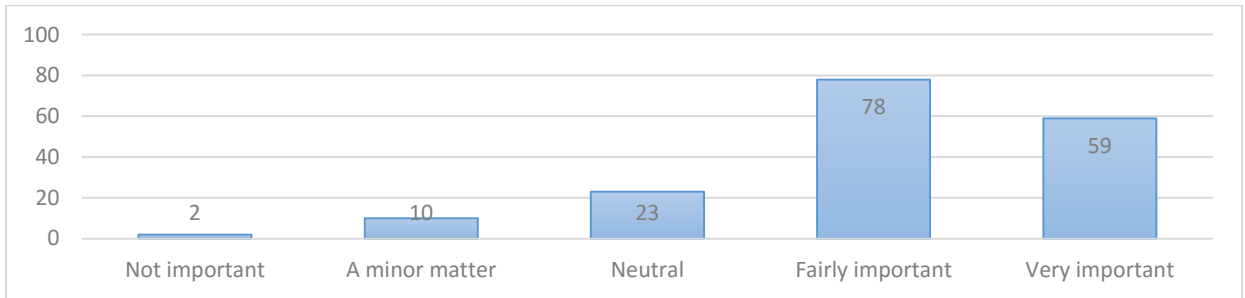
Figure 4.2 shows the size of the firms' sample. According to the classification of SMEs provided by the European Commission, Small companies are represented the most (55.81%), followed by a perfectly equal distribution between micro companies (combining the first two categories) and the medium sized companies (combining the last two categories) (22.1%).

Figure 4.2: Which is the number of your company's employees? (n=172)



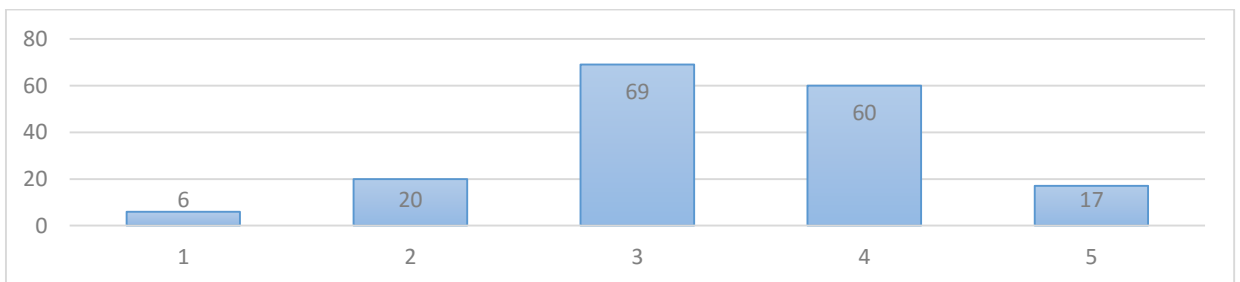
Being asked how important innovation is for the company, the majority affirms fairly important (45.61%) or very important (34.50%). This underlines how firms acknowledge the fundamental function of innovation for their businesses (Figure 4.3).

Figure 4.3: How important is innovation for your company? (n=172)



In addition, the sample is asked how they rate their innovation on a 5-point scale where 5 represent the higher rank (Figure 4.4). The responses stress an average innovation rate (as perceived by the managers or the respondents of the questionnaire). Indeed, the rate 3 (39.77%) and 4 (35.09%) are the most selected.

Figure 4.4: How do you rate your company on innovation? (1: Not innovative, 5: Very innovative) (n=172)



The question about whether their company is a family firm or not (Figure 4.5), shows clearly that more than two-third of the sample is a family-run business (123 Counts).

Finally, about the internationalization of the firm (Figure 4.6) the sample is evenly distributed because the internationally oriented firms (79 Counts) get close to non-internationally oriented firms (93 Counts).

Figure 4.5: Is your company a family-run business? (n=172)

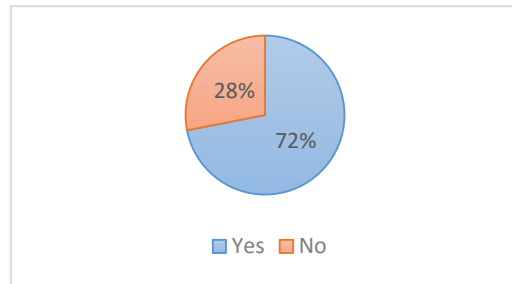
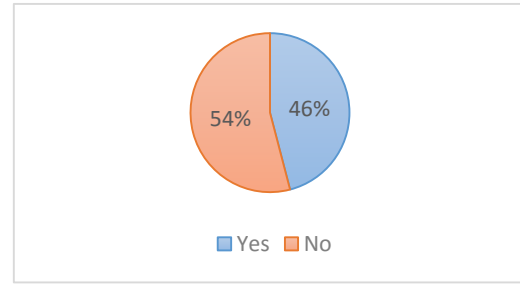
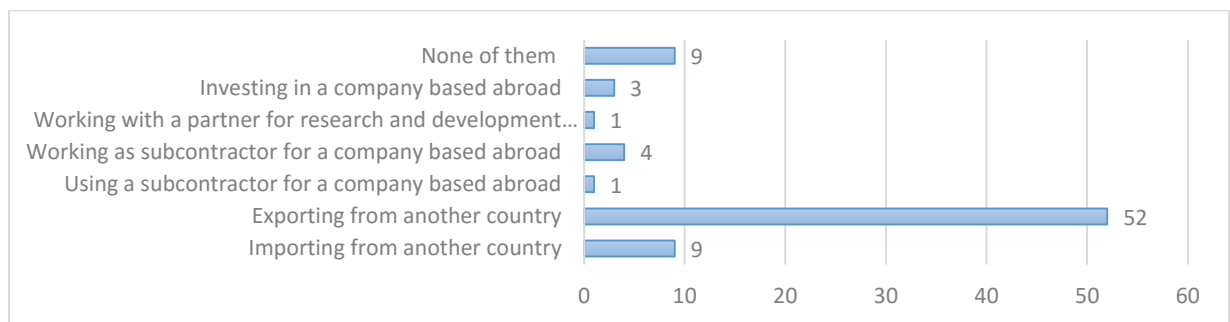


Figure 4.6: Does your firm have international activities abroad? (n=172)



More in details, the international activities of Italian SMEs represented by the sample (Figure 4.7) are exportation (65.82%) or importation (11.39%). The answers none of them are explained among others by the presence of foreign production units, exportations to another country or e-commerce activities.

Figure 4.7: Which kind of activity? (n=79)



A more detailed overview of the given answers is provided in the Appendix C.

4.2 Empirical analysis

One sample t-test is used to test whether Italian SMEs are on average not very innovative (H_1). The output of the One-Sample statistical analysis (Table 4.2) claims that the mean innovation level of the sample ($M=3.24$, $SD=0.78$) is higher than the cut-off value set at 3.0 (the scale midpoint). Indeed, statistically the mean innovation level is higher by a mean of 0.24, 95% CI [0.13 to 0.36] than the test value of 3.0, $t(171) = 4.134$, $p=.001$. As result, there is sufficient support for hypothesis 1 and based on the results, the average innovation of the sample is slightly higher than the scale midpoint.

Table 4.2: One-Sample Result for the average innovation level (*= 95% significance)

	M	SD	t	Sig.
Innovation	3,2476	,78533	4,134	,000

An independent samples t-test analyzes hypothesis 2, which states that more innovative SMEs are more performing. The cut-off value for defining the two innovation groups is 3.0 and the performance's means of the two groups are compared (Table 4.3).

Under the assumption of equal variances of the two samples (p of Leuvene's Test is greater than 0.05), the independent samples t-test is significant, $t(170)=6.161$, $p=0.01$. The average performance of Italian SMEs with an innovation level at least equal to 3 ($M=3.91$, $SD=0.583$) differs from the performance of Italian SMEs with an innovation level lower than 3 ($M=3.33$, $SD=0.551$). These results lead to the rejection of the null hypothesis and give sufficient support for hypothesis 2.

Table 4.3: Independent t-test results comparing Innovation groups on Performance (*= 95% significance)

	n	M	SD	t	df	Sig.
Innovation \geq 3,00	120	3,9188	,58303	6,161	170	,000
Innovation < 3,00	52	3,3317	,55191			

Regression analyses are used to test hypotheses 3 and 4 that analyze how much the firm performance is influenced by innovation practices (for each type and in aggregate). More in details, the hypotheses 3.1, 3.2, 3.3 explore the impact of product innovation, process innovation, and management innovation on firm performance, respectively. Whereas, the hypothesis 4 analyses the same impact by considering the innovation in aggregate. Moreover, for each regression some control variables (dummy) are included, namely the technological level, the age of the firm and the firm size.

To control the effect of these variables, a hierarchical regression is used, where in a first step are entered the control variables and in a second step are entered the respective predictors to be evaluated in the models.

The following table (4.4) reports the results for testing hypothesis 3.1.

Table 4.4: Coefficients Results Regression Analysis for Model without the Product Innovation (Model 1) and with the Product Innovation (Model 2)

Independent and control variables		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Model 1	Intercept	3,478		20,164	,000
	Technological level	,530	,371	5,145	,000
	Age	-,197	-,091	-1,257	,210
	Size	,072	,047	,650	,516
Model 2	Intercept	2,403		11,454	,000
	Technological level	,236	,165	2,403	,017
	Age	-,182	-,084	-1,333	,184
	Size	,097	,064	1,008	,315
	Product Innovation	,360	,501	7,347	,000

Both models predict the Performance of the firm at a statistically significant level [F(3,167)=9.541, p=0.001, R²=0.146, R² Adjusted=0.131]; [F(4,166)=22.921, p=0.001, R²=0.356, R² Adjusted=0.340].

The results show that the percent of variability of the dependent variable (Performance) explained by the models is higher in the model that includes the Product innovation variable. Indeed, the R² increase from 0.146 to 0.356. Thus, there is sufficient support for hypothesis 3.1.

With regards to the predictors, the age variable and the size variable do not provide significant contribution to either of the two models ($p > .05$), and the best predictors are the product innovation ($\beta = .50$) and the technological level ($\beta = .16$).

The same analysis is performed for the other two innovation typologies ($H_{3.2}$; $H_{3.3}$).

For the process innovation (Table 4.5), it is found that the model explains the Performance at a statistically significant level [$F(4,164)=13.036$, $p=0.001$, $R^2=0.239$, R^2 Adjusted=0.221]. Whereas, the coefficients analysis reveals, as in the previous hypothesis, that the process innovation ($\beta = .33$) and the technological level ($\beta = .24$) significantly explain the firm performance. Hence, there is sufficient support for hypothesis 3.2.

Table 4.5: Coefficients Results Regression Analysis for Model 3

Model	Independent and control variables	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Model 3	Intercept	2,861		13,410	,000
	Technological level	,350	,245	3,320	,001
	Age	-,172	-,079	-1,158	,249
	Size	,028	,019	,269	,788
	Process Innovation	,234	,332	4,497	,000

Regarding the hypothesis 3.3 (Table 4.6), the results of the analysis are statistically significant [$F(4,166)=14.794$, $p=0.001$, $R^2=0.263$, R^2 Adjusted=0.245] and the management innovation ($\beta = .36$) and the technological level ($\beta = .25$) influence the firm performance, whereas the statistical significance of the remaining dummy variables is low ($p > 0.05$). Thus, there is sufficient support for hypothesis 3.3.

Table 4.6: Coefficients Results Regression Analysis for Model 4

Model	Independent and control variables	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Model 4	Intercept	2,932		15,200	,000
	Technological level	,355	,249	3,484	,001
	Age	-,225	-,104	-1,539	,126
	Size	,058	,038	,567	,572
	Management Innovation	,236	,364	5,122	,000

For the hypothesis 4 a regression analysis is run to predict the Performance from the innovation (aggregated) of firms after controlling for the same variables used before (Table 4.7).

Table 4.7: Coefficients Results Regression Analysis for Model 5

Model	Independent and control variables	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Model 5	Intercept	2,431		11,388	,000
	Technological level	,223	,156	2,211	,028
	Age	-,193	-,089	-1,397	,164
	Size	,049	,032	,502	,616
	Innovation	,396	,491	6,990	,000

These variables statistically significantly predicted the Performance of the firm [F(4,166)=21.423, p=0.001, R²=0.340, R² Adjusted=0.325]. The innovation ($\beta = .49$) and the technological level ($\beta = .15$) influence the firm performance. Hence, hypothesis 4 is supported.

To test the last hypothesis, the Independent samples t-test is employed (Table 4.8). Under the condition of equal variance in the two samples (p of Levene's Test is greater than 0.05), the independent samples t-test is significant for the management innovation, $t(170)=-2.201$,

p=0.029. The average management innovation of SMEs owned by the family (M=2.8972, SD=0.983) differs from the management innovation of non-family owned SMEs (M=3.260, SD=0.938). Regarding the product innovation, assumed equal variance in the two samples, the t-test is not significant, $t(170)=1.189$, $p= 0.236$ and the average product innovation of family SMEs (M=3.542, SD=0.883) does not differ from those of non-family SMEs (M=3.364, SD=0.870). Finally, for the process innovation, under the same assumption of equality of variance, the t-test is not significant, $t(170)=0.721$, $p=0.472$. Indeed, the average process innovation of family firms (M=3.282, SD=0.898) does not differ from the innovation of non-family firms (M=3.171, SD=0.905).

Table 4.8: Independent t-test results comparing Innovation types on the criteria of family ownership (*= 95% significance)

Product Innovation						
	N	M	SD	t	df	Sig.
Family firm	124	3,5423	,88387	1,189	170	,236
Non-family firm	48	3,3646	,86903			
Process Innovation						
	N	M	SD	t	df	Sig.
Family firm	124	3,2823	,89826	,721	170	,472
Non-Family firm	48	3,1719	,90530			
Management Innovation						
	N	M	SD	t	df	Sig.
Family firm	124	2,8972	,98309	-2,201	170	,029
Non-family firm	48	3,2604	,93819			

Chapter 5

Discussion and Recommendations

5.1 Discussion

Innovation is important to SMEs' competitiveness because it contributes to firm growth, profitability and market opportunities (Van Auken et al., 2008). However, along with positive prospects, innovation brings a lot of uncertainties and risks. Indeed, it is a complex phenomenon whose effects on organization have yielded to mixed results in literature (Subramanian and Nilakanta, 1996).

This study based on the assumption that a subjective perception of the relationship between the innovation and the organizational outcomes can better examine this linkage, provides evidence on the relationship with specific reference to the Italian SMEs.

The results indicate that the average innovation performed by Italian SMEs is not as low as expected. Indeed, it is slightly above the average value set at 3.0 in the analysis. This seems to confirm that the innovation activity, especially in SMEs cannot be solely captured with the traditional indicators (Hall et al., 2009) that usually assign Italian SMEs at the lowest positions in Europe in terms of innovation, but that can be better grasped with subjective measures like the manager perceptions used in this research because many other factors need to be taken into account when assessing the innovation. On the other side, the descriptive statistics confirm that the innovation is considered important by Italian SMEs. This could suggest that Italian entrepreneurs acknowledge the role of innovation for their growth and success, and in part invest in it. However, the value obtained from the analysis, although positive is still near a medium level, which may advocate that entrepreneurs invest limitedly in innovation because they encounter several barriers rather than give little importance to it. Indeed, Small and Micro enterprises, which account for near 99 percent of the Italian SMEs, use as investment financing for innovation their own resources largely. This may disclose the limited innovativeness of Italian SMEs. Nonetheless, the results of the test provide encouraging data. When looking at the performance of Italian SMEs and the corresponding innovation level, the finding of the hypothesis tested stresses that in average more innovative SMEs, regardless the

innovation typology, show better performances. This finding may result obvious but it is not. Indeed, as mentioned, although in general literature recognizes a positive effect of innovation on firm performance, the results of many studies are more controversial (Heunks, 1998) and the reasons may be attributable to the uncertainty and variability of the results that innovation generates because of strains on internal resources, lack of capabilities to properly exploit the innovation outcomes or external market conditions.

Following, the regressions show that each innovation type is significantly associated with SMEs performance. Indeed, entrepreneurs rank the three types of innovation as important contributors to their performance.

One insight from the findings of the regressions is the relative importance of the innovation types. Indeed, the product innovation has the biggest predictor power on the firm performance, as said when SMEs innovate their products/services, they achieve better results in managers' perception comparing with the other two innovation types.

The partial rationale for this result may be found in the time lag effect because it might be necessary a certain amount of time to observe the effects of innovative initiatives on the firm performance, especially the financial performance (Gunday et al., 2011) and this can be related to the innovation types as well, because process innovation may result more complex than the others to implement; or simply because the effects of the innovation, both managerial and process, are less tangible in terms of performance effect. Also the sample composition might affect this result. Indeed, the large majority of SMEs in the sample are manufacturing firms that typically invest more in product innovation.

The costs of innovation might result a different reason of this variability. Indeed, when resources are restrained, managers need to allocate limited resources to more innovative projects. This can result in higher drop-out rates for more expensive investments like process innovation compared to the other two types. On the contrary, management innovation is usually less costly and time consuming and easier to implement compared to the others (Madrid-Guijarro et al., 2013), consequently it would have been expected a higher contribution to the performance of this innovation typology. However, the relative low Italian

SMEs' commitment to management innovation may be due cultural resistances to this kind of change, that are found typical of Italian family SMEs and it is also supported in testing the hypothesis 5.

The age and the size of the company are not found to significantly explain the performance of SMEs. This underlines the little importance of the two variables in the innovation effects on SME performance. Or said differently, managers of Italian SMEs believe that innovation have a positive impact on performance and this does not change for companies of different sizes or ages.

Regarding the technological level, this variable is found related to the dependent variable in all regressions. This suggests that different technology intensities of these firms lead to different performance results.

Likewise, when looking at the innovation as aggregate, the findings support the hypothesis claim. More in details, the results advocate that managers believe that innovation is important to their firms' performance, especially in high or medium high technologies intensity SMEs. The age and the size again are not relevant. The findings confirm the results of Van Auken et al. (2008) in the limits of the comparability because the model used in the thesis is slightly different from Van Auken paper.

Another important finding in the last hypothesis tested is that the management innovation is significantly lower in family-owned Italian SMEs. The result might depend on the family culture of these organizations that could stop new inputs or advancements at managerial level because they are seen as threats or they can be linked with the poor management practices adopted in the firm because as acknowledged by Bloom and Van Reenen (2007), family firms are more likely to be badly managed as they rely on internal chief executive officers (generally a family member), instead of involving external managers usually more skilled for the role.

On the contrary, for the other two types of innovation, not significant differences are found and, the average product and process innovations in family firms are above the level of non-family firms. This contradicts what the R&D investments level says but could suggest that Italian family firms follow a combined strategy of risk minimization and search of new

opportunities. More in details, the results advocate that these firms tend to be conservative in pursuing organizational changes and more opened toward product or process advancements. The possible explanation of this behavior is that Italian family firms prefer invest in initiatives that are directly linked with the financial utility derived from innovation such as the product and process innovations. Whereas, management innovation, which is typically more uncertain and ambiguous in its results (Kraus et al., 2012), could contradict the long-term and conservative planning horizons of family firms. Another reason might be found in the ownership structure because usually the concentration of possession reduces the need to implement management innovations (Battisti and Iona, 2009).

5.2 Implications for managers

Considering the analysis results, the following recommendations can be given to Italian SMEs managers.

Firstly, managers should put additional emphasis on innovations because greater innovation efforts are associated with greater firm performances. In the manager's perception, product innovation is the critical driver for the Italian SMEs success. Besides, a balance rate among the different types of innovation is more effective in improving the performance of the firm than implementing it alone as the results of the regression analysis suggest. Indeed, the positive effects of the other two types of innovation are likewise important in the firm performance and should be included in the business strategy of the firm although their effects might be less obvious and tangible or might exert their positive impact on firms' performance in the long-term.

As remarked by one of the respondent in the final comment, Italian managers usually do not fully apply modern business methods and processes. On the contrary, they prefer invest in product/service innovation because it is the easiest way to achieve more competitive positions in the market considering their funding shortages. This information is also supported by the data provided in the thesis. Therefore, SMEs should gain greater insight into how they

can achieve better performance by prioritizing their strategies and how they can develop the innovation as part of the business strategy because of its relevance.

Finally, specifically for Italian family SMEs, the investment in new management practices or management processes are lower compared to the others types. This could prevent new growth opportunities to family firms and it could pose the question whether the organizational culture, the organizational structures and the management styles of Italian family firms fit the requirements of changing market conditions or whether some adaptations are needed.

Chapter 6

Limitations and Future research

6.1 Limitations

Although the results are promising, they must be observed with caution because the study has several limitations.

Firstly, the analysis is based on a subjective perception of innovation and organizational performance. Consequently, managers or any other employee that filled out the questionnaire, might have had a vague understanding of the phenomenon analyzed providing unaffordable information.

Secondly, the measurement of the innovation and the performance might result uncompleted. For example, some indicators might be more important than others for assessing the two variables. Moreover, specifically for the organizational performance, the little theoretical clarity in its definition when linked with the innovation makes the construct used in the study even more uncertain.

Thirdly, the organizational outcomes of the innovation have a temporal dimension that it has been excluded in the study. Indeed, the effect of the innovations introduced over time, especially when the innovation has a long time lag effect, may be overcome by the respondents during the assessment of the effects generated.

In addition, regarding the family firms, the research has not explored the family involvement within the firms, which would allow to a more detailed understanding of innovation in the Italian family SMEs.

Besides, in the regressions analysis some control variables are found not to be significant suggesting that some other factors can better contribute in explaining the performance of SMEs related to innovation.

Lastly, because of the time limit, the entire research project has been carried out in the last two months. It would be better if the research was done in a longer time.

6.2 Implication for further research

The limitations offer avenues for further research. Definitely, it is recognized the usefulness of subjective measurement tools for analyzing the phenomenon under study in a context like SME's reality, where the innovation is sometimes hidden at first sight because it is incremental and might result of difficult perception even to the managers' eyes. Consequently, more indicators in innovation measurement which reflects the specific nature of innovation in these firms are needed. New researches might search for any contextual factor which can moderate the relationship identified in the thesis and in general new research should dedicate more efforts in understanding the nature of the relationship that the regression analysis has attempted to clarify.

In addition, the Organizational Performance construct requires stronger measures that link the innovation practices with the organizational performance, if possible supported by a theoretical rationale.

Moreover, longitudinal analysis might solve the problem of the long time effect linked with the innovation as suggested by van Auken et al. (2008) because it could provide evidence on the changes in evaluation over time. Therefore, further research should try to solve this issue.

Finally, a large scale survey and the conduction of the research taking into account the nature of the specific industry sectors is recommended for a more thorough analysis.

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Appendices

A. English Questionnaire

Dear Respondent,

For my thesis project at Hasselt University, I am conducting a survey on the innovation of Italian SMEs. The survey contains several questions and can be completed in 5-10 minutes.

If you are interested in the results of my research, you can enter your email address in the survey. As soon as the master thesis is ready, I will send you a one-page of average key results.

I can assure you that your data will be dealt with anonymously and will be used exclusively for research purposes. I thank you in advance for your response and feel free to contact me for any question or feedback.

Francesco Diana

Part one

1. Which is the sector of your company?
 - AGRICULTURE, FORESTRY AND FISHING
 - MINING AND QUARRYING
 - MANUFACTURING
 - ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY
 - WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES
 - CONSTRUCTION
 - WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES
 - TRANSPORTATION AND STORAGE
 - ACCOMMODATION AND FOOD SERVICE ACTIVITIES
 - INFORMATION AND COMMUNICATION
 - FINANCIAL AND INSURANCE ACTIVITIES
 - REAL ESTATE ACTIVITIES
 - PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES
 - ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES
 - PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY
 - EDUCATION
 - HUMAN HEALTH AND SOCIAL WORK ACTIVITIES
 - ARTS, ENTERTAINMENT AND RECREATION
 - OTHER SERVICE ACTIVITIES
 - ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE
 - ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES

2. Which is the sub-sector of your company?
 - AGRICULTURE, FORESTRY AND FISHING
 - Crop and animal production, hunting and related service activities
 - Forestry and logging
 - Fishing and aquaculture

 - MINING AND QUARRYING
 - Mining of coal and lignite
 - Extraction of crude petroleum and natural gas
 - Mining of metal ores
 - Other mining and quarrying
 - Mining support service activities

 - MANUFACTURING
 - Manufacture of food products
 - Manufacture of beverages
 - Manufacture of tobacco products
 - Manufacture of textiles
 - Manufacture of wearing apparel
 - Manufacture of leather and related products
 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
 - Manufacture of paper and paper products
 - Printing and reproduction of recorded media
 - Manufacture of coke and refined petroleum products
 - Manufacture of chemicals and chemical products
 - Manufacture of basic pharmaceutical products and pharmaceutical preparations
 - Manufacture of rubber and plastic products
 - Manufacture of other non-metallic mineral products
 - Manufacture of basic metals
 - Manufacture of fabricated metal products, except machinery and equipment
 - Manufacture of computer, electronic and optical products
 - Manufacture of electrical equipment
 - Manufacture of machinery and equipment n.e.c.
 - Manufacture of motor vehicles, trailers and semi-trailers
 - Manufacture of other transport equipment
 - Manufacture of furniture
 - Other manufacturing

- Repair and installation of machinery and equipment
- ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY
 - Electric power generation, transmission and distribution
 - Manufacture of gas; distribution of gaseous fuels through mains
 - Steam and air conditioning supply
- WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES
 - Water collection, treatment and supply
 - Sewerage
 - Waste collection, treatment and disposal activities; materials recovery
 - Remediation activities and other waste management services
- CONSTRUCTION
 - Construction of buildings
 - Civil engineering
 - Specialised construction activities
- WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES
 - Wholesale and retail trade and repair of motor vehicles and motorcycles
 - Wholesale trade, except of motor vehicles and motorcycles
 - Retail trade, except of motor vehicles and motorcycles
- TRANSPORTATION AND STORAGE
 - Land transport and transport via pipelines
 - Water transport
 - Air transport
 - Warehousing and support activities for transportation
 - Postal and courier activities
- ACCOMMODATION AND FOOD SERVICE ACTIVITIES
 - Accommodation
 - Food and beverage service activities
- INFORMATION AND COMMUNICATION
 - Publishing activities
 - Motion picture, video and television programme production, sound recording and music publishing activities
 - Programming and broadcasting activities
 - Telecommunications
 - Computer programming, consultancy and related activities
 - Information service activities
- FINANCIAL AND INSURANCE ACTIVITIES
 - Financial service activities, except insurance and pension funding
 - Insurance, reinsurance and pension funding, except compulsory social security
 - Activities auxiliary to financial services and insurance activities
- REAL ESTATE ACTIVITIES
 - Buying and selling of own real estate
 - Rental and operating of own or leased real estate
 - Real estate activities on a fee or contract basis
- PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES
 - Legal and accounting activities
 - Activities of head offices; management consultancy activities
 - Architectural and engineering activities; technical testing and analysis
 - Scientific research and development
 - Advertising and market research
 - Other professional, scientific and technical activities
 - Veterinary activities
- ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES
 - Rental and leasing activities
 - Employment activities
 - Travel agency, tour operator and other reservation service and related activities

- Security and investigation activities
- Services to buildings and landscape activities
- Office administrative, office support and other business support activities
- PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY
 - Administration of the State and the economic and social policy of the community
 - Provision of services to the community as a whole
 - Compulsory social security activities
- EDUCATION
 - Pre-primary education
 - Primary education
 - Secondary education
 - Higher education
 - Other education
 - Educational support activities
- HUMAN HEALTH AND SOCIAL WORK ACTIVITIES
 - Human health activities
 - Residential care activities
 - Social work activities without accommodation
- ARTS, ENTERTAINMENT AND RECREATION
 - Creative, arts and entertainment activities
 - Libraries, archives, museums and other cultural activities
 - Gambling and betting activities
 - Sports activities and amusement and recreation activities
- OTHER SERVICE ACTIVITIES
 - Activities of membership organisations
 - Repair of computers and personal and household goods
 - Other personal service activities
- ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE
 - Activities of households as employers of domestic personnel
 - Undifferentiated goods- and services-producing activities of private households for own use
- ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES

3. Please, indicate the age of your firm in years from its foundation:

- <5
- 5–10
- 11–15
- 16–20
- 21–50
- >50

4. Which is the number of your company's employees:

- 1
- 2-10
- 11-50
- 51-100
- More than 100

Part Two

5. Please indicate the number below that express the position of your company in relation to competitors. You can select only one number for each item.

S/N		Not competitive	Somewhat not competitive	Neither competitive nor uncompetitive	Moderately competitive	Very competitive	Variable
1	Number of new or modified products (services) introduced per year	1	2	3	4	5	Product innovation
2	Entrepreneurial character of the company when introducing new products (services)	1	2	3	4	5	
3	Speed of new products (services) introduced by competitors	1	2	3	4	5	
4	R&D investment in new products (services)	1	2	3	4	5	
5	Number of modifications in processes introduced per year	1	2	3	4	5	Process Innovation
6	Entrepreneurial character of the company when introducing new processes	1	2	3	4	5	
7	Speed of new processes introduced by competitors	1	2	3	4	5	
8	R&D investment in new processes	1	2	3	4	5	
9	Number of changes in the managerial systems	1	2	3	4	5	Managerial and system innovation
10	Novelty of company's managerial systems	1	2	3	4	5	
11	Search by company executives for new managerial systems	1	2	3	4	5	
12	Entrepreneurial character of the company when introducing new managerial systems	1	2	3	4	5	

6. Please indicate the number below that express the business performance of your company during the last year in relation to your competitors. You can select only one number for each item.

S/N		Not competitive	Somewhat not competitive	Neither competitive nor uncompetitive	Moderately competitive	Very competitive	Variable
1	Customer satisfaction	1	2	3	4	5	Customer satisfaction
2	Delivering value to your customers	1	2	3	4	5	
3	Delivering what your customers want	1	2	3	4	5	
4	Retaining valued customers	1	2	3	4	5	
5	Market share growth relative to competitors	1	2	3	4	5	Market effectiveness
6	Growth in sales revenue	1	2	3	4	5	
7	Acquiring new customers	1	2	3	4	5	
8	Increasing sales to existing customers	1	2	3	4	5	
9	Business unit profitability	1	2	3	4	5	Current (anticipated) profitability
10	Return on investments (ROI)	1	2	3	4	5	
11	Return on Sales (ROS)	1	2	3	4	5	
12	Reaching financial goals	1	2	3	4	5	

Part Three

7. How important is innovation for your company?

Not important	A minor matter	Neutral	Fairly important	Very important
1	2	3	4	5

8. How do you rate your company on innovation? (1: Not innovative, 5: Very innovative)

1	2	3	4	5
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9. What is your firm's relative position in the industry?

Minor 1-----2-----3-----4-----5 Dominant

10. Which is the technological level of you firm?

- High or medium-high
- Low or medium-low

11. Is it your company a family-run business?

- Yes
- No

12. Does your firm have international activities abroad?

- Yes
- No

13. If Yes, Which kind of activity? (More options are possible)

- Imported from another country
- Exported from another country
- Used a subcontractor based abroad
- Worked as subcontractor for a company based abroad
- Worked with a partner for research and development (R&D) purposes
- Invested in a company based abroad
- None of them (Please specify)

14. Please specify your current position within the company:

- CEO
- Deputy Manager
- General Manager
- Head of
- Owner
- President
- Senior Manager
- Employee
- Other (Please Specify)

Part Four

15. Considering all of the above statements and questions, would you like to mention anything specific that has not been covered in this survey? Or do you have any other questions, and concerns. You can type your comments in the below. I invite you to add your email address if interested in a summary of the research results.

Thank you for your participation

B. Italian Questionnaire

Gentile partecipante,

Per il mio progetto di tesi presso l'Università belga di Hasselt, sto conducendo un sondaggio sull'innovazione delle PMI italiane. Il questionario consiste in diverse domande e può essere completato in 5-10 minuti.

Se le interessano i risultati della mia ricerca, puoi inserire il suo indirizzo email nella domanda finale del questionario. Non appena la tesi di master sarà pronta, le invierò in formato breve i principali risultati della ricerca.

Le assicuro che i suoi dati verranno trattati in modo anonimo e saranno utilizzati esclusivamente per scopi di ricerca.

La ringrazio in anticipo per la sua risposta e non esiti a contattarmi per qualsiasi domanda o feedback.

Francesco Diana

Parte Prima

1. A quale settore appartiene la sua Azienda?

- AGRICOLTURA, SILVICOLTURA E PESCA
- ATTIVITÀ ESTRATTIVA
- ATTIVITÀ MANIFATTURIERE
- FORNITURA DI ENERGIA ELETTRICA, GAS, VAPORE E ARIA CONDIZIONATA
- FORNITURA DI ACQUA; RETI FOGNARIE, ATTIVITÀ DI TRATTAMENTO DEI RIFIUTI E RISANAMENTO
- COSTRUZIONI
- COMMERCIO ALL'INGROSSO E AL DETTAGLIO; RIPARAZIONE DI AUTOVEICOLI E MOTOCICLI
- TRASPORTO E MAGAZZINAGGIO
- SERVIZI DI ALLOGGIO E DI RISTORAZIONE
- SERVIZI DI INFORMAZIONE E COMUNICAZIONE
- ATTIVITÀ FINANZIARIE E ASSICURATIVE
- ATTIVITÀ IMMOBILIARI
- ATTIVITÀ PROFESSIONALI, SCIENTIFICHE E TECNICHE
- ATTIVITÀ AMMINISTRATIVE E DI SERVIZI DI SUPPORTO
- AMMINISTRAZIONE PUBBLICA E DIFESA; ASSICURAZIONE SOCIALE OBBLIGATORIA
- ISTRUZIONE
- SANITÀ E ASSISTENZA SOCIALE
- ATTIVITÀ ARTISTICHE, DI INTRATTENIMENTO E DIVERTIMENTO
- ALTRE ATTIVITÀ DI SERVIZI
- ATTIVITÀ DI FAMIGLIE E CONVIVENZE COME DATORI DI LAVORO PER PERSONALE DOMESTICO; PRODUZIONE DI BENI E SERVIZI INDIFFERENZIATI PER USO PROPRIO DA PARTE DI FAMIGLIE E CONVIVENZE
- ATTIVITÀ DI ORGANIZZAZIONI E ORGANISMI EXTRATERRITORIALI

2. Più nel dettaglio?

1. AGRICOLTURA, SILVICOLTURA E PESCA

- Produzioni vegetali e animali, caccia e servizi connessi
- Silvicoltura e utilizzo di aree forestali
- Pesca e acquicoltura

2. ATTIVITÀ ESTRATTIVA

- Estrazione di carbone e lignite
- Estrazione di petrolio greggio e di gas naturale
- Estrazione di minerali metalliferi
- Altre attività estrattive
- Attività dei servizi di supporto all'estrazione

3. ATTIVITÀ MANIFATTURIERE

- Industrie alimentari
- Produzione di bevande
- Industria del tabacco
- Industrie tessili
- Confezione di articoli di abbigliamento
- Confezione di articoli in pelle e simili
- Industria del legno e dei prodotti in legno e sughero, esclusi i mobili; fabbricazione di articoli in paglia e materiali da intreccio
- Fabbricazione di carta e di prodotti di carta
- Stampa e riproduzione su supporti registrati
- Fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio
- Fabbricazione di prodotti chimici
- Fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici
- Fabbricazione di articoli in gomma e materie plastiche
- Fabbricazione di altri prodotti della lavorazione di minerali non metalliferi
- Attività metallurgiche
- Fabbricazione di prodotti in metallo, esclusi macchinari e attrezzature
- Fabbricazione di computer e prodotti di elettronica e ottica
- Fabbricazione di apparecchiature elettriche
- Fabbricazione di macchinari e apparecchiature n.c.a.
- Fabbricazione di autoveicoli, rimorchi e semirimorchi
- Fabbricazione di altri mezzi di trasporto
- Fabbricazione di mobili
- Altre industrie manifatturiere

- Riparazione e installazione di macchine e apparecchiature
4. FORNITURA DI ENERGIA ELETTRICA, GAS, VAPORE E ARIA CONDIZIONATA
 - Produzione, trasmissione e distribuzione di energia elettrica
 - Produzione di gas; distribuzione di combustibili gassosi mediante condotte
 - Fornitura di vapore e aria condizionata
 5. FORNITURA DI ACQUA; RETI FOGNARIE, ATTIVITÀ DI TRATTAMENTO DEI RIFIUTI E RISANAMENTO
 - Raccolta, trattamento e fornitura di acqua
 - Gestione delle reti fognarie
 - Attività di raccolta, trattamento e smaltimento dei rifiuti; recupero dei materiali
 - Attività di risanamento e altri servizi di gestione dei rifiuti
 6. COSTRUZIONI
 - Costruzione di edifici
 - Ingegneria civile
 - Lavori di costruzione specializzati
 7. COMMERCIO ALL'INGROSSO E AL DETTAGLIO; RIPARAZIONE DI AUTOVEICOLI E MOTOCICLI
 - Commercio all'ingrosso e al dettaglio e riparazione di autoveicoli e motocicli
 - Commercio all'ingrosso, escluso quello di autoveicoli e di motocicli
 - Commercio al dettaglio, escluso quello di autoveicoli e di motocicli
 8. TRASPORTO E MAGAZZINAGGIO
 - Trasporto terrestre e trasporto mediante condotte
 - Trasporti marittimi e per vie d'acqua
 - Trasporto aereo
 - Magazzinaggio e attività di supporto ai trasporti
 - Servizi postali e attività di corriere
 9. SERVIZI DI ALLOGGIO E DI RISTORAZIONE
 - Servizi di alloggio
 - Attività di servizi di ristorazione
 10. SERVIZI DI INFORMAZIONE E COMUNICAZIONE
 - Attività editoriali
 - Attività di produzione cinematografica, di video e di programmi televisivi, di registrazioni musicali e sonore
 - Attività di programmazione e trasmissione
 - Telecomunicazioni
 - Programmazione, consulenza informatica e attività connesse
 - Attività dei servizi d'informazione
 11. ATTIVITÀ FINANZIARIE E ASSICURATIVE
 - Prestazione di servizi finanziari (ad esclusione di assicurazioni e fondi pensione)
 - Assicurazioni, riassicurazioni e fondi pensione, escluse le assicurazioni sociali obbligatorie
 - Attività ausiliarie dei servizi finanziari e delle attività assicurative
 12. ATTIVITÀ IMMOBILIARI
 - Compravendita di beni immobili effettuata su beni propri
 - Affitto e gestione di beni immobili propri o in locazione
 - Attività immobiliari per conto terzi
 13. ATTIVITÀ PROFESSIONALI, SCIENTIFICHE E TECNICHE
 - Attività legali e contabilità
 - Attività di sedi centrali; consulenza gestionale
 - Attività degli studi di architettura e d'ingegneria; collaudi e analisi tecniche
 - Ricerca scientifica e sviluppo
 - Pubblicità e ricerche di mercato
 - Altre attività professionali, scientifiche e tecniche
 - Servizi veterinari
 14. ATTIVITÀ AMMINISTRATIVE E DI SERVIZI DI SUPPORTO
 - Attività di noleggio e leasing
 - Attività di ricerca, selezione, fornitura di personale

- Attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività correlate
 - Servizi di investigazione e vigilanza
 - Attività di servizi per edifici e per paesaggio
 - Attività amministrative e di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese
15. AMMINISTRAZIONE PUBBLICA E DIFESA; ASSICURAZIONE SOCIALE OBBLIGATORIA
- Amministrazione pubblica: amministrazione generale, economica e sociale
 - Servizi collettivi delle amministrazioni pubbliche
 - Assicurazione sociale obbligatoria
16. ISTRUZIONE
- Istruzione prescolastica
 - Istruzione primaria
 - Istruzione secondaria
 - Istruzione universitaria e post-universitaria
 - Altri servizi di istruzione
 - Servizi di supporto all'istruzione
17. SANITÀ E ASSISTENZA SOCIALE
- Attività dei servizi sanitari
 - Servizi di assistenza residenziale
 - Assistenza sociale non residenziale
18. ATTIVITÀ ARTISTICHE, DI INTRATTENIMENTO E DIVERTIMENTO
- Attività creative, artistiche e d'intrattenimento
 - Attività di biblioteche, archivi, musei e altre attività culturali
 - Attività riguardanti scommesse e case da gioco
 - Attività sportive, di intrattenimento e di divertimento
19. ALTRE ATTIVITÀ DI SERVIZI
- Attività di organizzazioni associative
 - Riparazione di computer e di beni per uso personale e per la casa
 - Altre attività di servizi personali
20. ATTIVITÀ DI FAMIGLIE E CONVIVENZE COME DATORI DI LAVORO PER PERSONALE DOMESTICO; PRODUZIONE DI BENI E SERVIZI INDIFFERENZIATI PER USO PROPRIO DA PARTE DI FAMIGLIE E CONVIVENZE
- Attività di famiglie e convivenze come datori di lavoro per personale domestico
 - Produzione di beni e di servizi indifferenziati per uso proprio da parte di famiglie e convivenze
3. Quanti anni ha la sua Azienda?
- <5
 - 5–10
 - 11–15
 - 16–20
 - 21–50
 - >50
4. Quanti impiegati lavorano nella sua Azienda?
- 1
 - 2-10
 - 11-50
 - 51-100
 - Più di 100

Parte Seconda

5. Si prega di indicare il numero che esprime la posizione della sua Azienda in relazione ai suoi principali concorrenti. È possibile selezionare un solo numero per ogni voce.

S/N		Non competitiva	Più non competitiva che competitiva	Stessa posizione dei concorrenti	Moderatamente competitiva	Molto competitiva	Variabile
1	Numero di prodotti (servizi) nuovi o modificati introdotti per anno	1	2	3	4	5	Innovazione di Prodotto
2	Carattere imprenditoriale dell'azienda nell'introdurre nuovi prodotti (servizi)	1	2	3	4	5	
3	Velocità di introduzione di nuovi prodotti (servizi)	1	2	3	4	5	
4	Investimenti in ricerca e sviluppo di nuovi prodotti (servizi)	1	2	3	4	5	
5	Numero di processi modificati introdotti per anno	1	2	3	4	5	Innovazione di Processo
6	Carattere imprenditoriale dell'azienda nell'introdurre nuovi processi	1	2	3	4	5	
7	Velocità di introduzione di nuovi processi	1	2	3	4	5	
8	Investimenti in ricerca e sviluppo di nuovi processi	1	2	3	4	5	
9	Cambiamenti introdotti al Sistema manageriale	1	2	3	4	5	Innovazione Manageriale e di Sistema
10	Novità introdotte al Sistema manageriale dell'azienda	1	2	3	4	5	
11	Ricerca da parte dei dirigenti dell'azienda di nuovi sistemi manageriali	1	2	3	4	5	
12	Carattere imprenditoriale dell'azienda nell'introdurre nuovi sistemi manageriali	1	2	3	4	5	

6. Si prega di indicare il numero che esprime la performance della sua Azienda in relazione ai suoi principali concorrenti durante gli ultimi due anni. È possibile selezionare un solo numero per ogni voce

S/N		Non competitiva	Più non competitiva che competitiva	Stessa posizione dei concorrenti	Moderatamente competitiva	Molto competitiva	Variabile
1	Soddisfazione del cliente	1	2	3	4	5	Soddisfazione del cliente
2	Valore fornito ai propri clienti	1	2	3	4	5	
3	Offerta rispondente alle esigenze dei propri clienti	1	2	3	4	5	
4	Conservazione dei clienti	1	2	3	4	5	
5	Crescita della quota di mercato in relazione ai concorrenti	1	2	3	4	5	Efficacia del mercato
6	Crescita del fatturato	1	2	3	4	5	
7	Acquisizione di nuovi clienti	1	2	3	4	5	
8	Accrescimento del fatturato dei clienti esistenti	1	2	3	4	5	
9	Profittabilità dell'unità aziendale	1	2	3	4	5	Attuale redditività
10	Ritorno sugli investimenti (ROI)	1	2	3	4	5	
11	Redditività delle vendite (ROS)	1	2	3	4	5	
12	Conseguimento degli obiettivi finanziari	1	2	3	4	5	

Parte Terza

7. Quanto è importante l'innovazione per la sua Azienda?

Non importante	Un problema secondario	Neutrale	Abbastanza importante	Molto importante
1	2	3	4	5

8. Come reputa la sua Azienda in termini di innovazione? (1: Non innovativa, 5: Molto innovativa)

1	2	3	4	5
---	---	---	---	---

9. Qual è la posizione relativa dell'Azienda nel suo settore?

Minore 1-----2-----3-----4-----5 Dominante

10. Qual è il livello tecnologico della sua Azienda?

- Alto o medio-alto
- Basso o medio-basso

11. La sua Azienda è a conduzione familiare?

- Sì
- No

12. La sua Azienda svolge parte della sua attività all'estero?

- Sì
- No

13. Se sì, di che tipo? (Più risposte sono possibili)

- Importare da un altro paese
- Esportare in un altro paese
- Utilizzare un subappaltatore con sede all'estero
- Lavorare in qualità di subappaltatore per un'azienda con sede all'estero
- Lavorare con un partner con sede all'estero a scopo di Ricerca e Sviluppo (R&S)
- Investire in un'azienda con sede all'estero
- Nessuna (Si prega di specificare)

14. Si prega di specificare la sua attuale posizione all'interno dell'azienda

- CEO
- Vice direttore
- Direttore generale
- Responsabile
- Proprietario/Fondatore
- Presidente
- Senior Manager
- Impiegato
- Altro (Si prega di specificare)

Parte Quarta

15. Considerando le affermazioni e le domande di cui sopra, vorrebbe menzionare qualcosa di specifico che non è stato oggetto di questo sondaggio? O ha altre domande o dubbi?

Può aggiungere un commento nel box di seguito riportato. La invito ad aggiungere il suo indirizzo email se interessato ad una sintesi dei risultati della ricerca.

La ringrazio per la sua partecipazione

C. Data Report: Italian SMEs and innovation

Which is the sector of your company?

#	Answer	%	Count
1	AGRICULTURE, FORESTRY AND FISHING	2.91%	5
2	MINING AND QUARRYING	0.58%	1
3	MANUFACTURING	53.49%	92
4	ELECTRICITY, GAS, STEAM AND AIR CONDITIONING SUPPLY	0.00%	0
5	WATER SUPPLY; SEWERAGE, WASTE MANAGEMENT AND REMEDIATION ACTIVITIES	0.00%	0
6	CONSTRUCTION	5.23%	9
7	WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES	12.21%	21
8	TRANSPORTATION AND STORAGE	4.65%	8
9	ACCOMMODATION AND FOOD SERVICE ACTIVITIES	2.91%	5
10	INFORMATION AND COMMUNICATION	1.16%	2
11	FINANCIAL AND INSURANCE ACTIVITIES	0.58%	1
12	REAL ESTATE ACTIVITIES	0.00%	0
13	PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES	4.65%	8
14	ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES	1.16%	2
15	PUBLIC ADMINISTRATION AND DEFENCE; COMPULSORY SOCIAL SECURITY	0.00%	0
16	EDUCATION	0.00%	0
17	HUMAN HEALTH AND SOCIAL WORK ACTIVITIES	1.16%	2
18	ARTS, ENTERTAINMENT AND RECREATION	1.16%	2
19	OTHER SERVICE ACTIVITIES	7.56%	13
20	ACTIVITIES OF HOUSEHOLDS AS EMPLOYERS; UNDIFFERENTIATED GOODS- AND SERVICES-PRODUCING ACTIVITIES OF HOUSEHOLDS FOR OWN USE	0.00%	0
21	ACTIVITIES OF EXTRATERRITORIAL ORGANISATIONS AND BODIES	0.58%	1
	TOTAL	100%	

Which is the sub-sector of your company?

AGRICULTURE, FORESTRY AND FISHING

#	Answer	%	Count
1	Crop and animal production, hunting and related service activities	80.00%	4
2	Forestry and logging	0.00%	0
3	Fishing and aquaculture	20.00%	1
	Total	100%	5

MINING AND QUARRYING

#	Answer	%	Count
1	Mining of coal and lignite	0.00%	0
2	Extraction of crude petroleum and natural gas	0.00%	0
3	Mining of metal ores	0.00%	0
4	Other mining and quarrying	100.00%	1
5	Mining support service activities	0.00%	0
	Total	100%	1

MANUFACTURING

#	Answer	%	Count
1	Manufacture of food products	2.20%	2
2	Manufacture of beverages	0.00%	0
3	Manufacture of tobacco products	0.00%	0
4	Manufacture of textiles	7.69%	7
5	Manufacture of wearing apparel	4.40%	4
6	Manufacture of leather and related products	0.00%	0
7	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	2.20%	2
8	Manufacture of paper and paper products	4.40%	4
9	Printing and reproduction of recorded media	0.00%	0
10	Manufacture of coke and refined petroleum products	0.00%	0
11	Manufacture of chemicals and chemical products	6.59%	6
12	Manufacture of basic pharmaceutical products and pharmaceutical preparations	0.00%	0
13	Manufacture of rubber and plastic products	6.59%	6
14	Manufacture of other non-metallic mineral products	0.00%	0
15	Manufacture of basic metals	1.10%	1
16	Manufacture of fabricated metal products, except machinery and equipment	16.48%	15
17	Manufacture of computer, electronic and optical products	2.20%	2
18	Manufacture of electrical equipment	7.69%	7
19	Manufacture of machinery and equipment n.e.c.	12.09%	11
20	Manufacture of motor vehicles, trailers and semi-trailers	0.00%	0
21	Manufacture of other transport equipment	0.00%	0
22	Manufacture of furniture	9.89%	9
23	Other manufacturing	16.48%	15
24	Repair and installation of machinery and equipment	0.00%	0
	Total	100%	91

CONSTRUCTION

#	Answer	%	Count
1	Construction of buildings	44.44%	4
2	Civil engineering	11.11%	1
3	Specialised construction activities	44.44%	4
	Total	100%	9

WHOLESALE AND RETAIL TRADE; REPAIR OF MOTOR VEHICLES AND MOTORCYCLES

#	Answer	%	Count
1	Wholesale and retail trade and repair of motor vehicles and motorcycles	19.05%	4
2	Wholesale trade, except of motor vehicles and motorcycles	42.86%	9
3	Retail trade, except of motor vehicles and motorcycles	38.10%	8
	Total	100%	21

TRANSPORTATION AND STORAGE

#	Answer	%	Count
1	Land transport and transport via pipelines	25.00%	2
2	Water transport	37.50%	3
3	Air transport	0.00%	0
4	Warehousing and support activities for transportation	25.00%	2
5	Postal and courier activities	12.50%	1
	Total	100%	8

ACCOMMODATION AND FOOD SERVICE ACTIVITIES

#	Answer	%	Count
1	Accommodation	80.00%	4
2	Food and beverage service activities	20.00%	1
	Total	100%	5

INFORMATION AND COMMUNICATION

#	Answer	%	Count
1	Publishing activities	50.00%	1
2	Motion picture, video and television programme production, sound recording and music publishing activities	0.00%	0
3	Programming and broadcasting activities	0.00%	0
4	Telecommunications	50.00%	1
5	Computer programming, consultancy and related activities	0.00%	0
6	Information service activities	0.00%	0
	Total	100%	2

FINANCIAL AND INSURANCE ACTIVITIES

#	Answer	%	Count
1	Financial service activities, except insurance and pension funding	0.00%	0
2	Insurance, reinsurance and pension funding, except compulsory social security	0.00%	0
3	Activities auxiliary to financial services and insurance activities	100.00%	1
	Total	100%	1

PROFESSIONAL, SCIENTIFIC AND TECHNICAL ACTIVITIES

#	Answer	%	Count
1	Legal and accounting activities	0.00%	0
2	Activities of head offices; management consultancy activities	0.00%	0
3	Architectural and engineering activities; technical testing and analysis	12.50%	1
4	Scientific research and development	12.50%	1
5	Advertising and market research	0.00%	0
6	Other professional, scientific and technical activities	75.00%	6
7	Veterinary activities	0.00%	0
	Total	100%	8

ADMINISTRATIVE AND SUPPORT SERVICE ACTIVITIES

#	Answer	%	Count
1	Rental and leasing activities	0.00%	0
2	Employment activities	0.00%	0
3	Travel agency, tour operator and other reservation service and related activities	0.00%	0
4	Security and investigation activities	0.00%	0
5	Services to buildings and landscape activities	0.00%	0
6	Office administrative, office support and other business support activities	100.00%	2
	Total	100%	2

HUMAN HEALTH AND SOCIAL WORK ACTIVITIES

#	Answer	%	Count
1	Human health activities	50.00%	1
2	Residential care activities	50.00%	1
3	Social work activities without accommodation	0.00%	0
	Total	100%	2

ARTS, ENTERTAINMENT AND RECREATION

#	Answer	%	Count
1	Creative, arts and entertainment activities	50.00%	1
2	Libraries, archives, museums and other cultural activities	0.00%	0
3	Gambling and betting activities	0.00%	0
4	Sports activities and amusement and recreation activities	50.00%	1
	Total	100%	2

OTHER SERVICE ACTIVITIES

#	Answer	%	Count
1	Activities of membership organisations	16.67%	2
2	Repair of computers and personal and household goods	16.67%	2
3	Other personal service activities	66.67%	8
	Total	100%	12

Please, indicate the age of your firm in years from its foundation:

#	Answer	%	Count
1	<5	1.16%	2
2	5-10	1.74%	3
3	11-15	0.58%	1
4	16-20	5.81%	10
5	21-50	58.72%	101
6	>50	31.98%	55
	Total	100%	172

Which is the number of your company's employees?

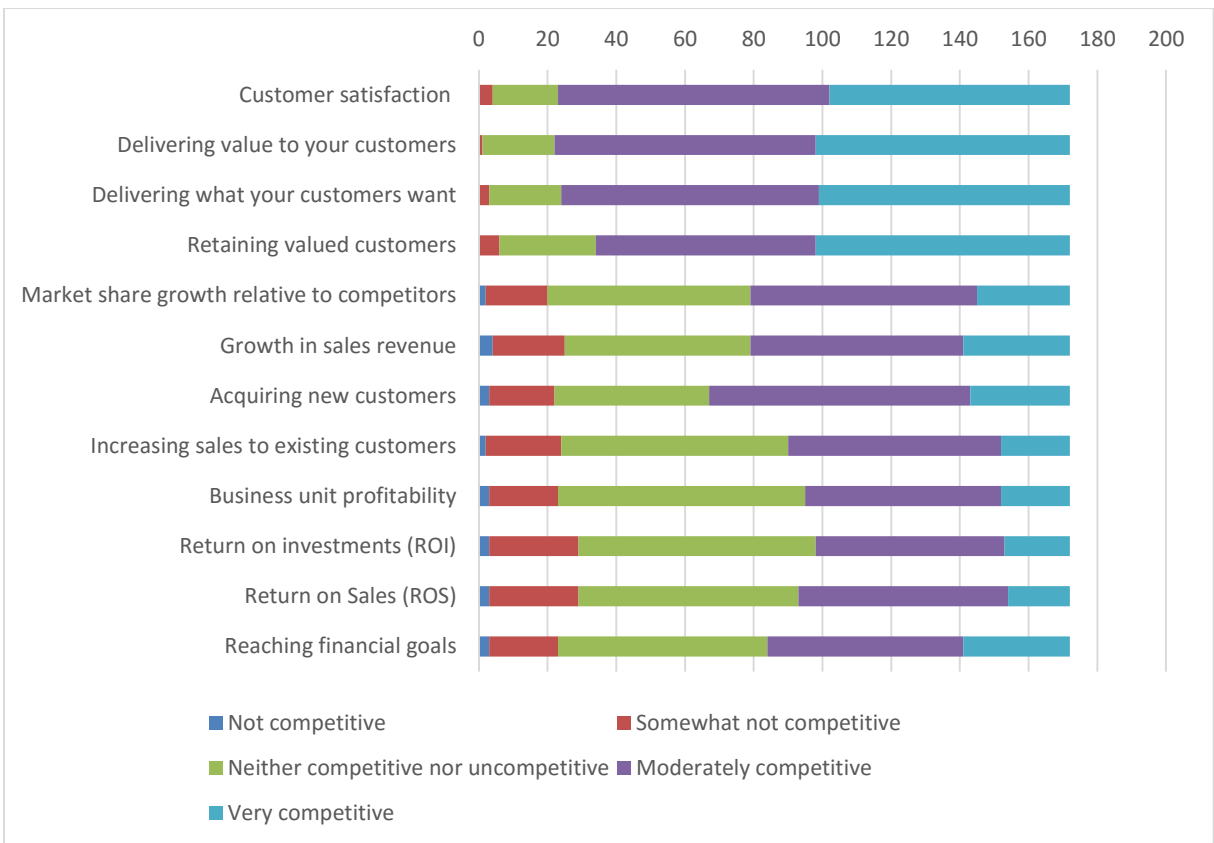
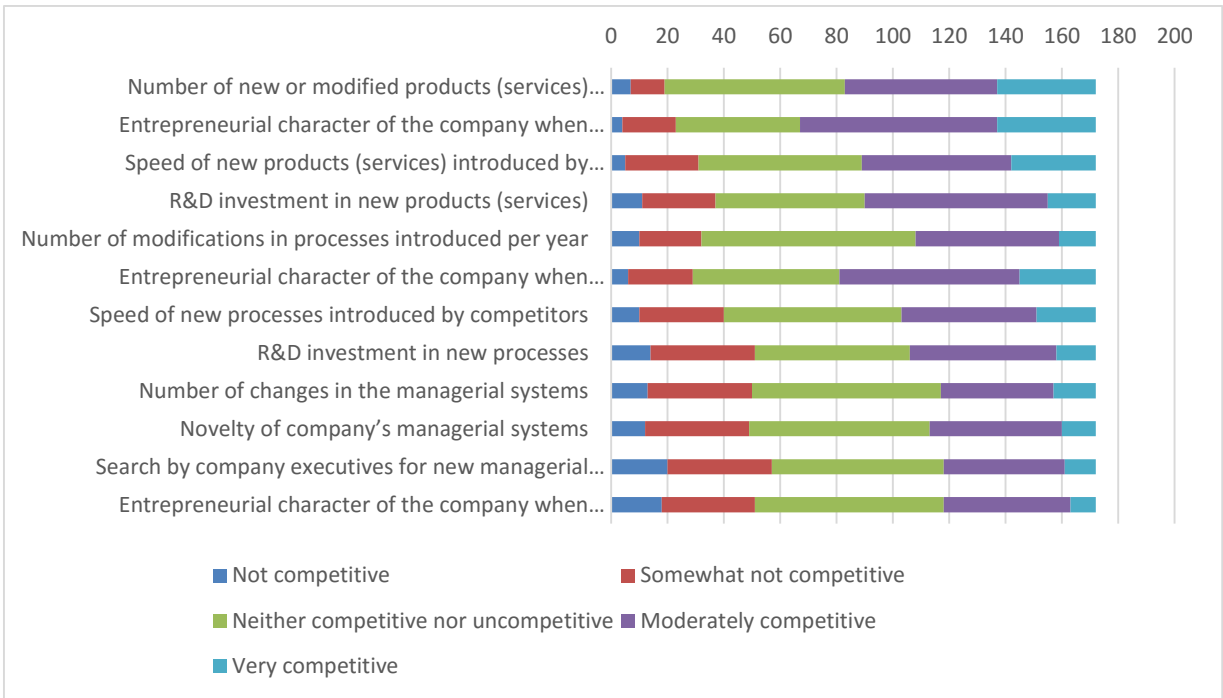
#	Answer	%	Count
1	1	2.33%	4
2	2-10	19.77%	34
3	11-50	55.81%	96
4	51-100	11.05%	19
5	Più di 100	11.05%	19
	Total	100%	172

Please indicate the number below that express the position of your company in relation to competitors. You can select only one number for each item.

#	Question	Not competitive		Somewhat not competitive		Neither competitive nor uncompetitive		Moderately competitive		Very competitive	
1	Number of new or modified products (services) introduced per year	5.38%	7	3.54%	12	8.84%	64	8.54%	54	14.64%	35
2	Entrepreneurial character of the company when introducing new products (services)	3.08%	4	5.60%	19	6.08%	44	11.08%	70	14.64%	35
3	Speed of new products (services) introduced by competitors	3.85%	5	7.67%	26	8.01%	58	8.39%	53	12.55%	30
4	R&D investment in new products (services)	8.46%	11	7.67%	26	7.32%	53	10.28%	65	7.11%	17
5	Number of modifications in processes introduced per year	7.69%	10	6.49%	22	10.50%	76	8.07%	51	5.44%	13
6	Entrepreneurial character of the company when introducing new processes	4.62%	6	6.78%	23	7.18%	52	10.13%	64	11.30%	27
7	Speed of new processes introduced by competitors	7.69%	10	8.85%	30	8.70%	63	7.59%	48	8.79%	21
8	R&D investment in new processes	10.77%	14	10.91%	37	7.60%	55	8.23%	52	5.86%	14
9	Number of changes in the managerial systems	10.00%	13	10.91%	37	9.25%	67	6.33%	40	6.28%	15
10	Novelty of company's managerial systems	9.23%	12	10.91%	37	8.84%	64	7.44%	47	5.02%	12
11	Search by company executives for new managerial systems	15.38%	20	10.91%	37	8.43%	61	6.80%	43	4.60%	11
12	Entrepreneurial character of the company when introducing new managerial systems	13.85%	18	9.73%	33	9.25%	67	7.12%	45	3.77%	9
	Total	Total	130	Total	339	Total	724	Total	632	Total	239

Please indicate the number below that express the business performance of your company during the last year in relation to your competitors. You can select only one number for each item.

#	Question	Not competitive		Somewhat not competitive		Neither competitive nor uncompetitive		Moderately competitive		Very competitive	
1	Customer satisfaction	0.00%	0	2.15%	4	3.28%	19	10.00%	79	14.40%	70
2	Delivering value to your customers	0.00%	0	0.54%	1	3.63%	21	9.62%	76	15.23%	74
3	Delivering what your customers want	0.00%	0	1.61%	3	3.63%	21	9.49%	75	15.02%	73
4	Retaining valued customers	0.00%	0	3.23%	6	4.84%	28	8.10%	64	15.23%	74
5	Market share growth relative to competitors	8.70%	2	9.68%	18	10.19%	59	8.35%	66	5.56%	27
6	Growth in sales revenue	17.39%	4	11.29%	21	9.33%	54	7.85%	62	6.38%	31
7	Acquiring new customers	13.04%	3	10.22%	19	7.77%	45	9.62%	76	5.97%	29
8	Increasing sales to existing customers	8.70%	2	11.83%	22	11.40%	66	7.85%	62	4.12%	20
9	Business unit profitability	13.04%	3	10.75%	20	12.44%	72	7.22%	57	4.12%	20
10	Return on investments (ROI)	13.04%	3	13.98%	26	11.92%	69	6.96%	55	3.91%	19
11	Return on Sales (ROS)	13.04%	3	13.98%	26	11.05%	64	7.72%	61	3.70%	18
12	Reaching financial goals	13.04%	3	10.75%	20	10.54%	61	7.22%	57	6.38%	31
	Total	Total	23	Total	186	Total	579	Total	790	Total	486



How important is innovation for your company?

#	Answer	%	Count
1	Not important	1.17%	2
2	A minor matter	5.85%	10
3	Neutral	12.87%	23
4	Fairly important	45.61%	78
5	Very important	34.50%	59
	Total	100%	172

How do you rate your company on innovation? (1: Not innovative; 5: Very innovative)

#	Answer	%	Count
1	1	3.51%	6
2	2	11.70%	20
3	3	39.77%	69
4	4	35.09%	60
5	5	9.94%	17
	Total	100%	172

What is your firm's relative position in the industry?

#	Answer	%	Count
1	1	2.34%	4
2	2	11.11%	19
3	3	36.84%	64
4	4	39.77%	68
5	5	9.94%	17
	Total	100%	172

Which is the technological level of you firm?

#	Answer	%	Count
1	High or medium-high	73.10%	125
2	Low or medium-low	26.90%	47
	Total	100%	172

Is it your company a family-run business?

#	Answer	%	Count
1	Yes	71.93%	123
2	No	28.07%	49
	Total	100%	172

Does your firm have international activities abroad?

#	Answer	%	Count
1	Yes	46.20%	79
2	No	53.80%	93
	Total	100%	172

Which kind of activity? (More options are possible)

#	Answer	%	Count
1	Importing from another country	11.39%	9
2	Exporting from another country	65.82%	52
3	Using a subcontractor for a company based abroad	1.27%	1
4	Working as subcontractor for a company based abroad	5.06%	4
5	Working with a partner for research and development (R&D) purposes	1.27%	1
6	Investing in a company based abroad	3.80%	3
7	None of them	11.39%	9
	Total	100%	79

None of them (Most relevant)

None of them
Exportations to another country
E-commerce activity
We started a joint-venture with a foreign company
We directly produce and sell abroad
We outsource the production process

Please specify your current position within the company:

#	Answer	%	Count
1	CEO	18.71%	32
2	Deputy Manager	1.17%	2
3	General Manager	8.19%	14
4	Head of	16.96%	29
5	Owner	16.37%	28
6	President	7.02%	12
7	Senior Manager	3.51%	6
8	Employee	22.81%	39
9	Other (Please Specify)	5.26%	9
	Total	100%	171

Other (Most relevant)

Other (Please specify)
Consultant
Legal representative
Marketing responsible
Scientific Manager
Sales Manager

Considering all of the above statements and questions, would you like to mention anything specific that has not been covered in this survey? Or do you have any other questions, and concerns. You can type your comments in the below (Most relevant).

Some additional insights.
Managers do not fully apply the current standardized methodologies of business management (strategy, business plan, business model, operations, financial management, quality management) and therefore do not apply modern methods but only old fashioned business approaches.
Nowadays, it is really difficult to go ahead without any external aid (public) or when they are too small.
The product requires low investments. Management would need more investments, but because we don't have margins We always postpone.
We are approaching business model innovation systems linked to the business model canvas tools
We are a company related to the automotive world, this sector is often the engine of innovations in the world. At present, we are committed to introducing several innovations: - Industry 4.0, increased production automation across all lines, - VDA 6.3, Automotive Industry Evaluation Standard (High Process Specialization), - CRM (Customer Relation Manager), a program designed to improve and enhance customer relationships, - Scheduler, which is a software that will enable us to improve and increase the planning activity

D. SPSS Output

Hypothesis 1

One-Sample t-test

One-Sample Test						
	Test Value = 3.0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
INNOVATION	4,134	171	,000	,24758	,1294	,3658

Hypothesis 2

Independent-Samples t-test

Group Statistics					
	INNOVATION	N	Mean	Std. Deviation	Std. Error Mean
PERFORMANCE	>= 3,00	120	3,9188	,58303	,05322
	< 3,00	52	3,3317	,55191	,07654

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PERFORMANCE	Equal variances assumed	1,903	,170	6,161	170	,000	,58702	,09528	,39894	,77510
	Equal variances not assumed			6,297	102,027	,000	,58702	,09322	,40211	,77192

Hypothesis 3.1

Regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,383 ^a	,146	,131	,59144
2	,596 ^b	,356	,340	,51532
a. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH				
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, PRODUCT_INNOVATION				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,012	3	3,337	9,541	,000 ^b
	Residual	58,416	167	,350		
	Total	68,428	170			
2	Regression	24,347	4	6,087	22,921	,000 ^c
	Residual	44,082	166	,266		
	Total	68,428	170			
a. Dependent Variable: PERFORMANCE						
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH						
c. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, PRODUCT_INNOVATION						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,478	,173		20,164	,000
	DUMMY_TECH	,530	,103	,371	5,145	,000
	DUMMY_AGE	-,197	,157	-,091	-1,257	,210
	DUMMY_SIZE	,072	,110	,047	,650	,516
2	(Constant)	2,403	,210		11,454	,000
	DUMMY_TECH	,236	,098	,165	2,403	,017
	DUMMY_AGE	-,182	,137	-,084	-1,333	,184
	DUMMY_SIZE	,097	,096	,064	1,008	,315
	PRODUCT_INNOVATION	,360	,049	,501	7,347	,000
a. Dependent Variable: PERFORMANCE						

Hypothesis 3.2

Regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,383 ^a	,146	,131	,59144
2	,489 ^b	,239	,221	,56008
a. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH				
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, PROCESS_INNOVATION				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,012	3	3,337	9,541	,000 ^b
	Residual	58,416	167	,350		
	Total	68,428	170			
2	Regression	16,357	4	4,089	13,036	,000 ^c
	Residual	52,072	166	,314		
	Total	68,428	170			
a. Dependent Variable: PERFORMANCE						
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH						
c. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, PROCESS_INNOVATION						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,478	,173		20,164	,000
	DUMMY_TECH	,530	,103	,371	5,145	,000
	DUMMY_AGE	-,197	,157	-,091	-1,257	,210
	DUMMY_SIZE	,072	,110	,047	,650	,516
2	(Constant)	2,861	,213		13,410	,000
	DUMMY_TECH	,350	,105	,245	3,320	,001
	DUMMY_AGE	-,172	,149	-,079	-1,158	,249
	DUMMY_SIZE	,028	,105	,019	,269	,788
	PROCESS_INNOVATION	,234	,052	,332	4,497	,000
a. Dependent Variable: PERFORMANCE						

Hypothesis 3.3

Regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,383 ^a	,146	,131	,59144
2	,513 ^b	,263	,245	,55126
a. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH				
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, MANAGEMENT_INNOVATION				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,012	3	3,337	9,541	,000 ^b
	Residual	58,416	167	,350		
	Total	68,428	170			
2	Regression	17,983	4	4,496	14,794	,000 ^c
	Residual	50,445	166	,304		
	Total	68,428	170			
a. Dependent Variable: PERFORMANCE						
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH						
c. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, MANAGEMENT_INNOVATION						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,478	,173		20,164	,000
	DUMMY_TECH	,530	,103	,371	5,145	,000
	DUMMY_AGE	-,197	,157	-,091	-1,257	,210
	DUMMY_SIZE	,072	,110	,047	,650	,516
2	(Constant)	2,932	,193		15,200	,000
	DUMMY_TECH	,355	,102	,249	3,484	,001
	DUMMY_AGE	-,225	,146	-,104	-1,539	,126
	DUMMY_SIZE	,058	,103	,038	,567	,572
	MANAGEMENT_INNOVATION	,236	,046	,364	5,122	,000
a. Dependent Variable: PERFORMANCE						

Hypothesis 4

Regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,383 ^a	,146	,131	,59144
2	,583 ^b	,340	,325	,52142
a. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH				
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, INNOVATION				

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,012	3	3,337	9,541	,000 ^b
	Residual	58,416	167	,350		
	Total	68,428	170			
2	Regression	23,297	4	5,824	21,423	,000 ^c
	Residual	45,131	166	,272		
	Total	68,428	170			
a. Dependent Variable: PERFORMANCE						
b. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH						
c. Predictors: (Constant), DUMMY_SIZE, DUMMY_AGE, DUMMY_TECH, INNOVATION						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,478	,173		20,164	,000
	DUMMY_TECH	,530	,103	,371	5,145	,000
	DUMMY_AGE	-,197	,157	-,091	-1,257	,210
	DUMMY_SIZE	,072	,110	,047	,650	,516
2	(Constant)	2,431	,213		11,388	,000
	DUMMY_TECH	,223	,101	,156	2,211	,028
	DUMMY_AGE	-,193	,138	-,089	-1,397	,164
	DUMMY_SIZE	,049	,097	,032	,502	,616
	INNOVATION	,396	,057	,491	6,990	,000

a. Dependent Variable: PERFORMANCE

Hypothesis 5

Independent Samples t-test

Group Statistics					
	Is it your company a family-run business?	N	Mean	Std. Deviation	Std. Error Mean
PRODUCT_INNOVATION	Yes	124	3,5423	,88387	,07937
	No	48	3,3646	,86903	,12543
PROCESS_INNOVATION	Yes	124	3,2823	,89826	,08067
	No	48	3,1719	,90530	,13067
MANAGEMENT_INNOVATION	Yes	124	2,8972	,98309	,08828
	No	48	3,2604	,93819	,13542

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PRODUCT_INNOVATION	Equal variances assumed	,047	,829	1,189	170	,236	,17776	,14956	-,11748	,47299
	Equal variances not assumed			1,198	86,855	,234	,17776	,14844	-,11729	,47280
PROCESS_INNOVATION	Equal variances assumed	,027	,869	,721	170	,472	,11038	,15303	-,19170	,41247
	Equal variances not assumed			,719	84,936	,474	,11038	,15356	-,19494	,41571
MANAGEMENT_INNOVATION	Equal variances assumed	,636	,426	-2,201	170	,029	-,36324	,16504	-,68904	-,03744
	Equal variances not assumed			-2,247	89,281	,027	-,36324	,16165	-,68443	-,04205

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Diana, Francesco

Datum: **22/08/2017**