Innovative vs. non-innovative manufacturing SMEs: do strategies and goals differ?

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Abstract: This paper aims to understand if innovative and non-innovative manufacturing small and medium size enterprises (SME) reveal similar or different goals and strategies. This research uses an AMOS SPSS multigroup analysis with data from the community innovation survey (CIS) 2012 to test goals and strategies' similarities. An independent samples t-test is performed to all variables that do not load in the theoretical model. Results suggest similarities in goals (all enterprises value goals that, eventually, can translate in financial gains). With regard to the strategies, results suggest three similar strategies to all enterprises and five different ones that are more associated to innovative enterprises. Results can be important for managers and policy makers since it was possible to uncover a set of strategies that are more common in 'innovative enterprises'.

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1   Introduction

Innovation is, nowadays, present in all our lives, being seen as a way to overcome economic stagnation, to push the development of countries and to increase enterprises internationalisation, performance and competitiveness. It is a fashionable term use by the media, entrepreneurs, research institutions, politicians and private citizens, exerting a constant pressure on companies to produce new innovations. Research funds and public money is increasingly directed to innovation, aiming to boost knowledge and internationalisation capacities of enterprises and, consequently, boost economic growth and employment.

Innovation has, for centuries, served the purpose of making the lives of human beings more comfortable. Throughout history, support, generate and implement innovations has been of utmost importance, not only for the well-being, but also for the survival of individuals, groups and even of civilisations and nations (Meissner and Kotsemir, 2016). During the past 30 years, innovation has been a synonym to the development of nations, technological progress and the engine of business success (Kotsemir et al., 2013). Innovation is not just understand as the creation of something new (product innovation), but is also seen as a solution to several problems (process, marketing and organisational innovation) (Habidin et al., 2015). The term 'innovation' is increasingly used by policy makers, marketing specialists, experts in advertising and management consultants – not as a scientific concept of strict sense, but as a metaphor, political promise, slogan or a word of order (Kotsemir et al., 2013). Innovation is, by nature, a term free of values and broad that encompasses various activities, since the discovery of something until the first practical application of new knowledge (Kotsemir and Meissner, 2013), and is considered a way to win competitive advantages on the market (Lahi, 2014), being an important driver for firm growth (Goedhuys and Veugelers, 2011). To increase competitiveness, an economy needs to base its development in science, technology and knowledge, because these are the factors that will originate innovations (Gust-Bardon, 2015), and innovation is the key factor that will determine an enterprise's success in competitive markets and positively influence economic growth (Naranjo-Valencia et al., 2015; Yu et al., 2013; Wu, 2011; Sener and Sandogan, 2011).

SMEs are fundamental in the economies (Angilella and Mazzù, 2015), they create a large number of jobs, foster innovation, and are crucial in promoting competitiveness and creativity (Luo et al., 2016; Dalohoun et al., 2009; Haselip et al., 2014). Innovation also increases productivity through reducing the costs of production, increasing the value of what is produced or by creating new markets so, it is essential to know which goals and strategies enterprises follow to increase their productivity and their innovative potential (Sadek, 2015; Slater et al., 2014).

SMEs, especially, manufacturing SMEs are mainly product innovators (Lin and Chen, 2006) so, it is essential to determine what are the strategies and goals of these enterprises, in order to encourage the emergence of more innovative enterprises through the right orientation of public policies and managers decisions, either through encouraging or financing enterprises and managers to adopt the goals and strategies that may open the way to transform non-innovative enterprises in innovative ones.

The research question that will guide this study is: do goals and strategies vary between innovative and non-innovative SMEs? To answer this question two hypotheses will be formulated:

H1 Innovative and non-innovative enterprises goals are similar.

H2 Innovative and non-innovative enterprises strategies are not similar.

To test the hypotheses mentioned above, a multigroup analysis and an independent samples t-test will be performed. Multigroup analysis permits to examine two samples or groups to determine if they are statistically similar or not. In this case, we will test two groups of enterprises (innovative and non-innovative ones) to determine if their strategies and goals are similar or different. Two latent variables are going to be created (strategies and goals), in order to determine if all the eight strategies variables load (are statistically significant) in the latent variable strategies and if the four goals variables load in the

latent variable goals. All strategies and goals present in community innovation survey (CIS) are going to be tested. To the strategies and goals that, eventually, do not fit in the original model, is going to be applied an independent samples t-test to determine if their values are statically different between innovative and non-innovative enterprises and if so, to determine what strategies and goals are more common in the two types of enterprises.

Attending to this context, this paper aims to determine the differences or similarities between goals and strategies of innovative and non-innovative enterprises, highlighting the strategies and goals that can be associated to innovative enterprises. This will allow to direct public policies and managers decisions in a way that can increase the potentialities of turning a non-innovative enterprise in an innovative one. This work is, therefore, motivated by the need to deepen the knowledge about innovative enterprises, particularly, manufacturing SMEs, since these enterprises are the engines of product innovation and lead technological implementations.

SMEs represent the majority of European enterprises and any knowledge that might help foster their innovative behaviour will contribute to economic development. As SMEs face many constrains to become innovative, this work might shed some light about what kind of objectives and strategies these enterprises should follow to enhance the chances of becoming innovative. On the other hand, it will allow to distinguish strategic actions of innovative and non-innovative enterprises, identifying the areas in which they have similarities and differences, contributing to a better scientific understanding of both typologies of enterprises.

This work is divided as follows: first a literature review subordinated to the theme of innovation in SMEs focusing, specifically, in their strategies, goals, difficulties and flexibility, follow by the presentation of the methodology that is going to be use, namely, the structural equation model (multigroup analysis) and the independent samples t-test, than the obtained results from both methodologies will be presented followed by the discussion of results and the presentation of the main conclusions of this work.

2   Literature review

In this section, the theoretical framework of the study is going to be presented with sections dedicated to SMEs importance, to financing, cooperation, internationalisation, SMEs flexibility, performance and competitiveness.

2.1   SMEs importance

SMEs are the backbone of economies (Angilella and Mazzù, 2015), they provide a large number of job opportunities and foster the spirit of entrepreneurship and technical innovation, being crucial in promoting competitiveness and employment (Luo et al., 2016; Dalohoun et al. 2009). They are the engine of the European economy, accounting for approximately 99% of all companies (Borbás, 2015; Dannreuther, 2007), are an important part of the exporting sector (Cernat et al., 2014) and are pointed out as the engines of creativity, innovation and knowledge creation (Haselip et al., 2014; Audretsch, 2004).

SMEs play an important role in economic growth and the development of globalisation has led to the emergence of opportunities and challenges that only a small part of them are able to identify and exploit. Since the majority of SMEs are often under pressure in domestic markets due to imports of cheap products and foreign competition, most countries recognise the importance of supporting SMEs so that they can have access to new market opportunities, new technologies, new knowledge and new forms of applying existing knowledge into new innovations or technologies, often in situations of scarcity of resources and many times to compensate this lack of resources (Boskov, 2016; Mukherjee et al., 2016; Strumsky and Lobo, 2015; Resele, 2015).

Several authors remark that SMEs do not have the financial capacity of large companies, leading to a smaller rate of innovative activities (Nikolić et al., 2015). With this scenario in mind, many public policies are directed to SMEs, although, it is not an easy task to establish fruitful actions. SMEs represent an heterogeneous population, being necessary to take into account several factor like, for example, the nature of entrepreneurs, the sector in which they work and the general conditions in the economy that could affect their productivity as well as taking in consideration what strategies and objectives should public policies implement to maximise SMEs innovative potential (Dannreuther, 2007; Samara et al., 2012; Resele, 2014).

The efforts directed to SMEs are based on the premise that they are the engine of economic development but the institutional and market failures block their growth, thus justifying governmental interventions in support of the same, since their importance for economic growth is unquestionable (Beck and Demirguc-Kunt, 2006; Wonglimpiyarat, 2011). Supporting innovative enterprises is especially important because they reveal higher growth rates comparing to non-innovative ones (Almus et al., 1999). That is why governments concerned in maintaining or increasing the competitiveness of their economies increasingly use policies to promote scientific advancement and the adoption of new techniques or technologies by the industrial sector. And, at the same time, they create policies to attract international innovative enterprises and foreign direct investment to establish themselves in their countries to boost innovation activities throughout the economy, increasing internal market competitiveness and, consequently, innovation (Clark and Guy, 1998; Guimón, 2011). Increasingly, more economists recognise that innovation based on knowledge is a key driver for competitiveness. However, this requires a powerful knowledge base, often focused on technology and innovation as a precondition for the construction and development of a true innovative economy (Gackstatter et al., 2014). Innovation activities function as engines of labour productivity, especially in economies where knowledge is one of the main sources of competitive advantages (Antonioli et al., 2010; Mertins and Will, 2006), and where, in terms of long-term growth, strategies related to entrepreneurship based on the exploration and evaluation of opportunities are of the upmost importance (Aparicio et al., 2016).

2.2 *Financing, cooperation and internationalisation*

The main obstacles for SMEs, regarding the implementation of their innovative potential and their ability to create jobs, are the access to external financing, along with the lack of distribution channels, high cost of innovation and concentrated markets (Bass and Ernst-Siebert, 2007; Angilella and Mazzù, 2015; Sirilli and Evangelista, 1998;

Hadjimanolis, 1999; Pellegrino and Savona, 2013). A competitive business environment, of which access to finance is an important component, facilitates the entrance and exit of enterprises, as well as their growth and, therefore, it is essential to the development of countries. Although SMEs represent a significant share of the total employment in many countries, one of the reasons why they may not be able to contribute to economic growth is because they face greater barriers to growth. Improve support institutions helps all deserving enterprises to have access to finance and may facilitate the knowledge of new partners that may introduce them to new distribution channels and, consequently, help these enterprises to grow. This effect is greater in SMEs, since evidence suggests that small businesses have, relatively, better performance in comparison with large companies in countries with more developed institutions (Beck and Demirguc-Kunt, 2006; Resele, 2015). Financial resources are also necessary to foster entrepreneurial orientation in business and, consequently, innovation activities. When these are scarce, the attractiveness of enterprises for taking risks decreases and, therefore, decreases their innovative capacity (Eniola and Entebang, 2015). With that in mind, many governments stimulate innovation in enterprises trough, for example, R&D subsidies, tax credits and innovative public procurement (Guerzoni and Raiteri, 2015).

Mergers and acquisitions influence the probability of enterprises engage in innovation activities or persist with them, and helps enterprises to cross the 'threshold of innovation', increasing the likelihood of transition from a non-innovative to an active innovator (Cefis and Marsili, 2015). This happens because many mergers are innovation driven, motivated by the need for technological advances, transfers of innovation and gains of efficiency through the exploitation of synergies and opportunities for growth (Alhenawi and Krishnaswami, 2015; Ghosh and Dutta, 2014). These R&D efforts are often associated with networking activities, which replace the economies of scale related to the size of enterprises (Mazzanti and Zoboli, 2009; Naudé et al., 2014), fostering innovation (Lee et al., 2010; Phelps, 2010; Zeng et al., 2010) and contributing to the introduction of new products with a high degree of innovation (Becker and Dietz, 2004; Nieto and Santamaría, 2007), since networking gives them access to knowledge, resources, markets or technologies (Håkanson, 2005; Inkpen and Tsang, 2005; Van de Vrande et al., 2009).

Through mergers and acquisitions it is possible to achieve important strategic objectives as, for example, acquire technologies that, sometimes, are not yet available in the home country of the enterprise and acquire resources and trademarks that constitute essential strategic resources to internationalisation (Deng, 2013; Deng and Yang, 2015). All of these are important factors used by enterprises to implement their national and international strategies, being that mergers and acquisitions are considered the favourite strategy of CEOs (Ferreira et al. 2014). Due to the lack of financial resources to expand through mergers and acquisitions, cooperation is the only way for many SMEs to develop their innovative potential, especially in economic uncertainty contexts where the difficulty of access to credit for innovative SMEs increases (Lee et al., 2015).

Attending to the scarcity of resources (Dubey et al. 2015) and the difficulty of access to funding, some SMEs choose mergers and acquisitions and other ones employ cooperative alliances with various partners, in order to achieve their goals (Cholakova, 2013; Luo et al., 2016; Meuleman and De Maeseneire, 2012; Rupeika-Apoga, 2014). These strategic cooperation alliances may be aimed at internal development, market transitions, acquisitions or development of innovations, share costs, risks and knowledge

(Teng, 2007; Faria et al., 2010; Nunes et al., 2013; Kuittinen et al., 2013), being that the complementarity of resources increases the potential value of these alliances, depending on the ability of enterprises to discover and lead productive resources combinations (Wiklund and Shepherd, 2009). SMEs seem to be the ideal vehicle for promoting both sustainable economic growth based on innovation and job creation (Bass and Ernst-Siebert, 2007).

A key component in the success of manufacturing enterprises is the extension of its innovation capacity. In recent decades, as a result of intense international competition, fragmented and demanding markets and fast-changing technologies, innovation has become one of the most relevant factors for enterprises. In manufacturing SMEs, increasing the level of innovation contributes to financial performance, specifically, it is relevant the innovation developed to meet the needs of customers, as well as innovations developed aiming to differentiate from competitors (Bigliardi, 2013). To succeed, an enterprise must have the ability to innovate faster than their best competitors. Essentially, this ability is knowing how to identify new ways of doing business, develop new technologies and products and enter in new markets with new organisational forms (Teng, 2007). Regardless of the adoption of new technologies, when the size of the enterprise increases, the effect of the introduced innovation has a greater impact on financial performance (Bigliardi, 2013), even because as an enterprise grows its' learning abilities improves, specifically, their technological learning abilities which will cause them to be even more innovative (Breschi et al., 2000; Camisón-Zornoza et al., 2004). Innovative enterprises should guide this knowledge to achieve their goals, whether they are developing a new product, improve relations with customers or position themselves as an important strategic partner of a larger enterprise (Heavin and Adam, 2013).

SMEs will gain with international knowledge exchanges (Ambos, 2004) because, nowadays, innovation and internationalisation are two sides of the same coin and it seems difficult to build a causal relation between these two aspects: innovative enterprises increasingly need international markets, in the same way that international markets increasingly demand more innovative enterprises so, consumers demand new innovative products and innovative enterprises demand new markets to expand (Bass and Ernst-Siebert, 2007; Williams and Shaw, 2011). SMEs internationalisation is not, apparently, easy. The previously mentioned lack of distribution channels is one of the main problems, followed by language barriers, financial problems and lack of market knowledge (Bass and Ernst-Siebert, 2007). An extensive network of collaboration and entrepreneurial orientation are also ways to gain competitive advantages and overcome these problems (Guan et al., 2015; Hessels and Parker, 2013; Korsakienė and Tvaronavičienė, 2012; Oparaocha, 2015; Rodríguez and Navarro–Chávez, 2015). Networking enterprises or enterprises embedded in R&D collaborations maximise their potential to innovate (Broekel et al., 2015; Hong et al., 2016), empowers their access to more resources (Nahapiet, 1998) and, the greater the degree of internationalisation, the greater will be its positive impact on efficiency and performance (Pangarkar, 2008; Giovannetti et al., 2011). In terms of internationalisation it is possible to conclude that collaboration or strategic alliances with other enterprises are beneficial.

SMEs are known to be highly flexible and this is one of its main competitive advantages. Strategic flexibility, or as some authors call it, dynamic capabilities, allows

them to react quickly to feedback from unknown external conditions, adapt rapidly to external environmental changes and use existing resources to create new configurations of procedures or resources, also allowing them to, eventually, quickly change their initial objectives through agile methods (Hannola et al., 2013; Tonelli et al., 2013). This strategic focus and adaptability allows SMEs to succeed in rapidly internationalise their operations in unknown markets. Specifically, the continuing efforts to build local relations, the proactive and entrepreneurial orientation in the welcoming environment and a flexible strategic approach with heterogeneous expectations affects, positively, the extension of the international commitment and the scope of the international commitment in the host country (Kalinic and Forza, 2012; Hurley and Hult, 1998; Giniuniene and Jurksiene, 2015). In the internationalisation process, SMEs decision-makers are central, as well as their experience, knowledge and clear definition of internationalisation goals and strategies to reach them (Schweizer 2012). Though not to be neglected the importance of institutional support by governments, private institutions, industrial associations or others in the home country of the enterprise, that can facilitate initial internationalisation contacts (Zhang et al., 2016; Watkins et al., 2015) as well as ties with key industrial or commercial partners that can also facilitate the internationalisation process, since it is unquestionable the existent relationship between innovation and international growth (Zucchella and Siano, 2014).

2.3 SMEs flexibility

In general, manufacturing SMEs define their mission taking into account its survival, growth or profit, probably because of the obstacles they face and that were already mentioned. Hence, it appears that strategy definition is oriented to production with a focus on organisational processes, instead of controlling and proactively responding to the external environment. Size, limited capabilities and lack of innovative culture causes that many SMEs are not market-oriented (Duygulu et al., 2016; Dubey et al., 2015). Being that, it is precisely this flexible market orientation with a focus on customer satisfaction and with a good after-sales service, which causes superior performance in SMEs when compared with low flexible SMEs and with strategies more focused on price and on produced quantities (Lorentz et al., 2016; Zhou et al., 2005; Erdil et al., 2004). To succeed in a competitive environment, industrial SMEs that are not part of high-tech sectors need to be proactive in relation to market opportunities, receptive to innovation and take the lead in the search for new products. However, their weaknesses include lack of flexibility, an only partially open culture and an organisational structure that impedes continuous innovation (Laforet, 2008). On the other hand, in high-tech enterprises, the entrepreneurial approach is more present, there is a strategic guidance focused on the market that is facilitated by top managers perceptions about the future of the industry, current operations, performance and organisational resources, including R&D infrastructure, technological alliances and international experience of staff (Lau et al., 2008; Martin et al., 2015), as well as an organisational culture that leverages innovation (Burdon et al., 2013). These enterprises have a significant return in relation to the value that they invest in R&D, suggesting that strategies for continuous innovation are profitable (Montresor and Vezzani, 2015; Filippetti and Archibugi, 2010). Despite the above, the perception that enterprise's growth is equal to innovation, which in turn is equivalent to competitiveness, is not 100% correct. Although not innovative, enterprises can achieve the same goals, since this depends on the relationships

between knowledge, technological progress, institutional development and dynamics of aggregate demand – strategies that companies use to mitigate the risks (Romagnoli and Romagnoli, 2016).

Managerial innovation affects positively operational performance, quality performance, delivery performance, and flexibility performance (Abdallah et al., 2016; González et al., 2013). Innovative enterprises are more flexible and often implement strategies in result of an analysis on the opportunities and development options that are currently available, proving that these enterprises are attentive to their surrounding environment and ready to react quickly so, these strategies do not assume the form of rigid plans in a long-term perspective, because innovative enterprises do not establish formal guidelines for their strategies. In turn, non-innovative enterprises tend to increase the degree of formalisation as they grow, mirroring that an increase of resources brings difficulties related with activities coordination, demonstrating their inferior flexibility when compared to innovative enterprises (Radomska and Sołoducho-Pelc 2015). In general, SMEs seem to be more focused on internal and short-term planning, neglecting the long-term planning (Ates et al., 2013), which is in line with the study of Radomska and Soloducho-Pelc (2015), that analysed business strategies of innovative and non-innovative enterprises, reaching the following conclusions in relation to innovative enterprises:

- enterprise size does not determine the degree of strategy formalisation

- enterprises that implement growth strategies take measures to mitigate risk

- large enterprises implement, more often, a global expansion strategy

- the smaller the enterprise, the lower the time horizon of the developed strategy

- there is no relationship between enterprise size and access to funding sources.

The obtained results for non-innovative enterprises were the following:

- larger enterprises have more formalised strategies

- the size of the enterprise is not a determining factor in the attitude toward risk and measures taken to mitigate risk

- the implementation of a global expansion strategy is not associated with the size of the enterprise

- strategy time horizon is shorter in smaller enterprises

- the larger the enterprise, higher is the focus on dynamic growth

- enterprises growth allows eliminating barriers in access to capital.

Strategy implementation in industrial SMEs is not static, it is a continuous and interactive process, which requires the enterprise to acquire knowledge and collect market information. In accordance with the defined strategies, SMEs that are capable of effectively control the inventory, can reduce their expenses with the costs of warehousing and storage space, avoiding maintaining obsolete stocks and preventing loses due to thefts. At the same time, SMEs that effectively and efficiently operate their machines can

reduce the downtime of the same, increasing their use and production capacity. SMEs that produce products with the lowest cost should be able to sell them at a reduced price, conquering a bigger market share and, consequently, sales growth. By conquering a greater market share and sales growth, SMEs will be able to achieve better performance in exports while SMEs that have quality products and distinctive design will build a better reputation in the marketplace (Singh and Mahmood, 2014). Also by adopting a specific innovation design earlier than others, SMEs may gain a competitive advantage, since being the first to market allows them to gain marketing intelligence, build production capabilities and, eventually, protect their innovations trough intellectual property rights (Beise, 2005).

A key component in the success of industrial enterprises is the extension of its innovation capacity. In recent decades, because of intense international competition, fragmented and demanding markets and fast-changing technologies, innovation has become one of the most relevant factors for enterprises. In industrial SMEs, increasing the level of innovation contributes to financial performance, specifically, it is relevant the innovation developed to meet the needs of customers, as well as innovations developed aiming to differentiate from competitors (Bigliardi, 2013). To succeed, an enterprise must have the ability to innovate faster than their best competitors.

Innovation (specially technological innovation) is a crucial factor to foster economic development and sustainable competitive advantages in an increasingly variable environment so, the innovative behaviour of enterprises is a major source of competitiveness by leveraging its performance, leading to product and process developments and to continuous innovation, allowing them to be more profitable than non-innovators (Calabrese et al., 2013; Atalay et al., 2013; Durmuşoğlu and Barczak, 2011). That is why developed economies base its competitiveness in science and technological development (Gust-Bardon, 2015; Sultan, 2013). In these economies innovation boosts labour productivity and, consequently, competitiveness and performance (Antonioli et al., 2010; Mertins and Will, 2006).

To enhance SMEs performance trough innovation, enterprises must acknowledge that innovation culture and strategy should be align with their internal innovation processes (Terziovski 2010), and new product development should promote a culture of organisational innovation that stimulates and encourages creativity contributing to the emergence of innovations (Molina-Castillo et al., 2011; Otero-Neira et al., 2010; Augusto and Coelho, 2009).

When enterprises allocate resources to innovative activities (specially the development of new products) they expect to obtain competitiveness and performance advantages, when compared to their competitors, mainly because the fact that being the first to reach the market creates a competitive advantage (Chang and Cho, 2008; Tung, 2012; Molina-Castillo et al., 2011; Otero-Neira et al., 2010). This innovative capacity is primordial to the success of industrial enterprises, especially because it improves performance, allows to meet consumer needs and allows them to differentiate from competition (Bigliardi, 2013).

3   Methodology

This work will perform a multigroup analysis using, for this purpose, the software IBM SPSS Amos version 23 (structural equation design software). The analysis of

structural equations is a generalised modelling technique used to test the validity of theoretical models that define causal, hypothetical, relationships between variables. These relations are represented by parameters that indicate the magnitude of the effect that the so-called independent variables have on other variables, so-called depending, in a composite set of hypotheses concerning patterns of associations between variables in the model. The multigroup analysis aims to evaluate if the structure of the structural equations model is equivalent (invariant) in different groups or populations with different characteristics. Invariance is the name given to the property of a quantity that does not change when a change occurs in the conditions of the observer. This type of analysis requires the existence of mutually exclusive groups where a set of items were measured or evaluated (Marôco, 2014).

In other words, multigroup analysis permits to examine two samples or groups to determine if they are statistically similar or not. In this case we will test two groups of enterprises (innovative and non-innovative ones) to determine if their strategies and goals are similar or different. Two latent variables are going to be created (strategies and goals), in order to determine if all the eight strategies variables load (are statistically significant) in the latent variable strategies and if the four goals variables load in the latent variable goals. All strategies and goals present in CIS are going to be tested. To the strategies and goals that, eventually, do not fit in the original model, is going to be applied an independent samples t-test to determine if their values are statically different between innovative and non-innovative enterprises and if so, to determine what strategies and goals are more common in the two types of enterprises.

Innovation statistics based on CIS are part of EUROSTAT database, namely, in the science, technology and digital society indicators. CIS consists of a questionnaire that is applied every two years by European Union to determine innovation dynamics of a set of countries. CIS aims to analyse enterprises innovation activities. The harmonised survey[1] intents to provide information about innovation and the results can be analyse by sectors and types of enterprises, taking in consideration different types of innovation and the various aspects necessary to the development of an innovation, such as objectives, sources of information, public funding, expenditure on research and development, among others.

CIS collects information on product and process innovation, as well as organisational and marketing innovations. Innovations are based on the implementation of a new or significantly improved product. In some cases, innovative enterprises may cooperate with other parties and cooperation partners may be located in other countries or on other continents. The gathered information in the context of CIS allows an analysis of cooperation with national or international partners. In the 2012 data collection exercise, a specific module focused on the goals of the enterprises and on the strategies they used, as well as the obstacles they encountered in achieving those goals.

According to the performed literature review it is expected some similarity between innovative and non-innovative SMEs goals because they all define their mission taking into account their survival, growth or profit (Romagnoli and Romagnoli, 2016). On the other hand strategies of innovative and non-innovative enterprises should be different because innovative SMEs are more flexible and react faster to environmental changes (Lorentz et al., 2016; Zhou et al., 2005; Erdil et al., 2004; Radomska and Sołoducho-Pelc, 2015; Ates et al., 2013) so, the Hypothesis (H) that are going to be tested are:

H1 Innovative and non-innovative enterprises goals are similar (Romagnoli and Romagnoli, 2016).

H2 Innovative and non-innovative enterprises strategies are not similar (Lorentz et al., 2016; Zhou et al., 2005; Erdil et al., 2004; Radomska and Sołoducho-Pelc, 2015; Ates et al., 2013).

The conceptual model of this research is in Figure 1.

Figure 1   Conceptual model (see online version for colours)
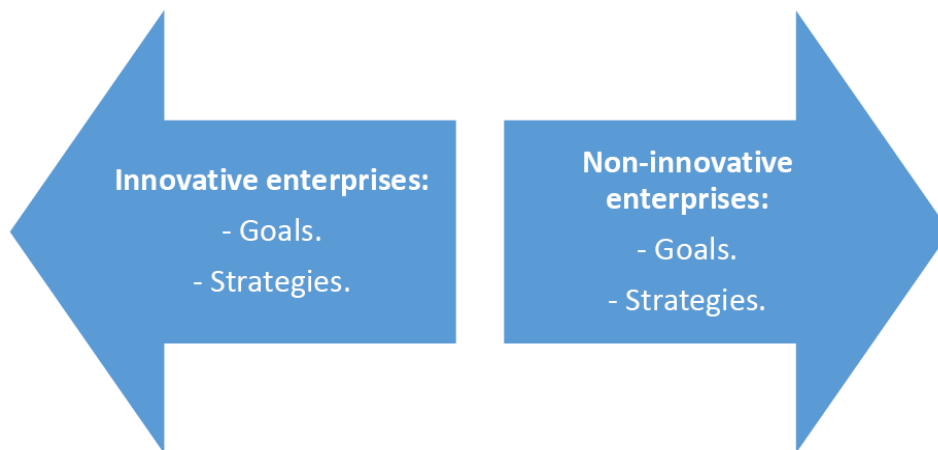
3.1   Data section

In CIS 2012 it was possible to obtain data for 16 countries, namely, Belgium, Bulgaria, Germany, Estonia, France, Greece, Italy, Cyprus, Lithuania, Hungary, Malta, Netherlands, Poland, Slovakia, Serbia and Turkey. The sample is composed by SMEs from the industrial sector (except construction), being that CIS only has data for SMEs with a number of employees between 10 and 249 (inclusive). There is no data for SMEs with a number of employees below ten and an enterprise with 250 or more employees is consider a large enterprise. Since CIS divides SMEs in two groups according to their number of employees, one between 10 to 49 and another one between 50 to 249, in the present study we will consider these two groups and compare results between them.

The total number of innovative and non-innovative enterprises of the sample, per country, are presented in Table 1. For the purpose of this study, it will be taken into account the average response of all enterprises per country.

The variables used and their acronyms, which will be used to facilitate the graphic design and presentation of the model, as well as the results, are listed in Table 2.

The original model that is going to be tested is in Figure 2, having the previously mentioned eight variables related to strategies and four related to goals.

Table 1 Study sample

Country	From 50 to 249 employees		250 employees or more	
	Innovative enterprises	*Non-innovative enterprises*	*Innovative enterprises*	*Non-innovative enterprises*
Belgium	1.876	839	522	102
Bulgaria	1.101	1.623	304	211
Germany (until 1990 former territory of the FRG)	20.659	7.142	5.932	502
Estonia	430	239	69	19
France	8.046	4.104	2.472	578
Croatia	594	560	207	61
Italy	9.842	3.937	1.936	358
Cyprus	113	77	23	14
Lithuania	631	770	158	59
Hungary	1.144	1.530	398	194
Malta	92	41	26	4
Netherlands	3.018	1.577	550	253
Poland	3.888	6.980	1.425	804
Slovakia	617	924	246	150
Serbia	868	717	282	117
Turkey	6.943	5.437	1.623	822

Table 2 Variables and acronyms

	Variables	*Acronyms*
Strategies	Enterprises that consider building alliances highly important	S1
	Enterprises that consider reducing costs of purchased materials, components or services highly important	S2
	Enterprises that consider increasing flexibility/responsiveness highly important	S3
	Enterprises that consider reducing in-house costs of operation highly important	S4
	Enterprises that consider introducing new or significantly improved goods or services highly important	S5
	Enterprises that consider developing new markets within Europe highly important	S6
	Enterprises that consider developing new markets outside Europe highly important	S7
	Enterprises that consider intensifying or improving the marketing of goods or services highly important	S8
Goals	Enterprises considering the decrease in costs highly important	G1
	Enterprises considering an increase in market share highly important	G2
	Enterprises considering an increase in profit margins highly important	G3
	Enterprises considering an increase in turnover highly important	G4

Figure 2   Model to test (see online version for colours)
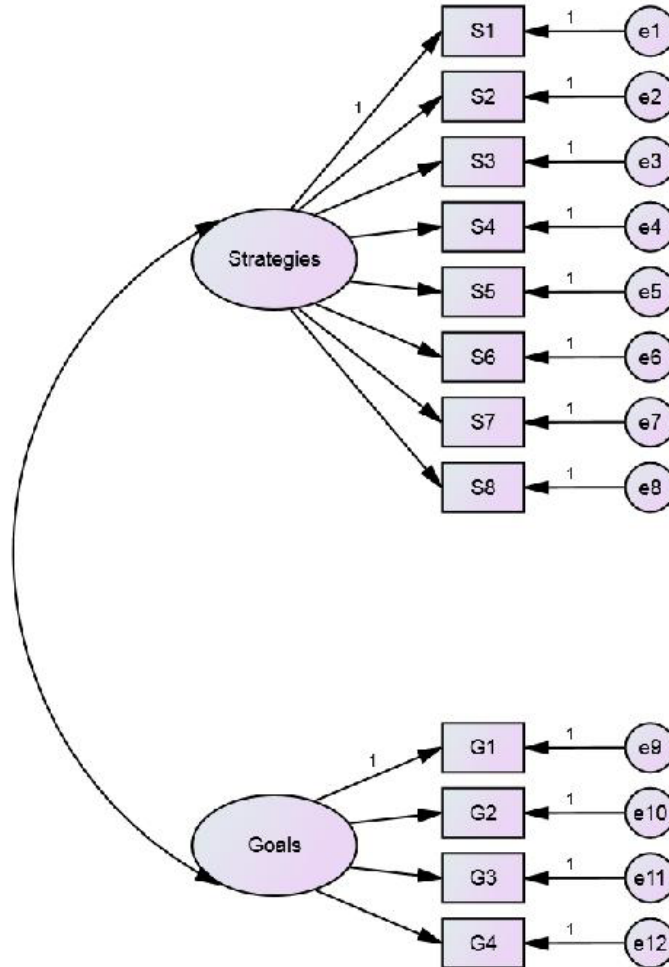
4   Results

Results from the original model (for SMEs with more than 49 employees and less than 250) show that none of the strategies variables is statistically significant neither in innovative nor in non-innovative enterprises – p-values are all above 0.05 (columns P of Tables 3 and 4).

After these initial results, the most statistically insignificant variable from strategies was successively eliminated to determine if the remaining ones were statistically significant. After all possible variable eliminations, no strategies variables remained, the final model that is going to be possible to test only has the four previously mentioned goals.

Table 3 Regression weights: (non-innovative – default model)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
S1 <--- Strategies	1.000				
S2 <--- Strategies	2.242	1.502	1.492	.136	
S3 <--- Strategies	1.055	.762	1.384	.166	
S4 <--- Strategies	2.566	1.723	1.490	.136	
S5 <--- Strategies	–.017	.298	–.057	.955	
S6 <--- Strategies	.883	.679	1.301	.193	
S7 <--- Strategies	.320	.358	.894	.371	
S8 <--- Strategies	–.073	.275	–.265	.791	
G1 <--- Goals	1.000				
G2 <--- Goals	.766	.248	3.089	.002	
G3 <--- Goals	.830	.292	2.843	.004	
G4 <--- Goals	.725	.194	3.740	***	

Note: ***In statistics outputs this means that the variable is significant for $p < 0.001$.

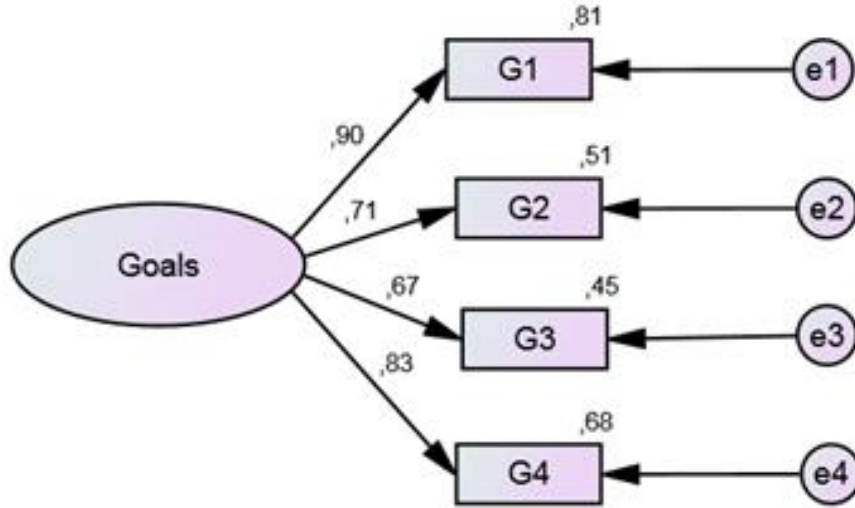**Table 4** Regression weights: (innovative – default model)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
S1 <--- Strategies	1.000				
S2 <--- Strategies	1.519	.986	1.540	.124	
S3 <--- Strategies	1.508	.968	1.557	.119	
S4 <--- Strategies	2.421	1.491	1.624	.104	
S5 <--- Strategies	.674	.489	1.379	.168	
S6 <--- Strategies	.751	.584	1.287	.198	
S7 <--- Strategies	.573	.549	1.043	.297	
S8 <--- Strategies	.200	.426	.470	.638	
G1 <--- Goals	1.000				
G2 <--- Goals	.631	.225	2.809	.005	
G3 <--- Goals	.982	.336	2.926	.003	
G4 <--- Goals	.705	.202	3.488	***	

Note: ***In statistics outputs this means that the variable is significant for $p < 0.001$.

The fact that none of the strategies variables is significant is due to the fact that the variables do not load in the factor, this means that one or more strategy variables do not contributes to the factor called 'strategies'.

The final model for non-innovative and innovative enterprises and their standardise coefficients are in Figures 3 and 4. In both models, the regression coefficients are high, they vary in between 0.67 to 0.90 in the case of non-innovative enterprises and in between 0.63 to 0.98 in the case of innovative enterprises. The other standardise coefficients (more to the right in the models) are the residuals, the percentage of variance that can not be explained by the model. Although some residuals values are high, both models are statistically significant with all variables having p-values below 0.05 (see Tables 5 and 6).

Figure 3   Non-innovative enterprises final model (see online version for colours)

Figure 4   Innovative enterprises final model (see online version for colours)
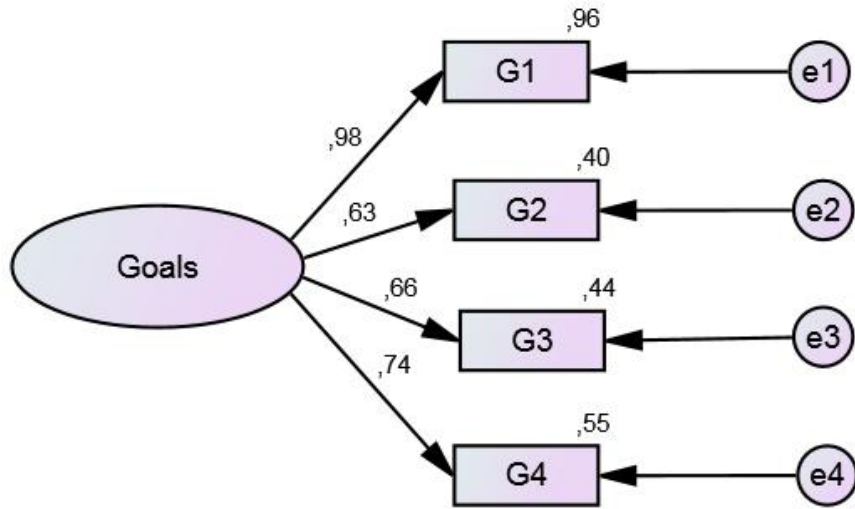
Table 5   Regression weights: (non-innovative – unconstrained)

	Estimate	S.E.	C.R.	P	Label
G1 <--- Goals	1.000				
G2 <--- Goals	.765	.248	3.087	.002	a1_1
G3 <--- Goals	.830	.292	2.845	.004	a2_1
G4 <--- Goals	.725	.194	3.741	***	a3_1

Note: ***In statistics outputs this means that the variable is significant for $p < 0.001$.

Table 6 Regression weights: (innovative – unconstrained)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
G1 <--- Goals	1.000				
G2 <--- Goals	.614	.228	2.694	.007	a1_2
G3 <--- Goals	.975	.340	2.870	.004	a2_2
G4 <--- Goals	.692	.208	3.329	***	a3_2

Note: ***In statistics outputs this means that the variable is significant for $p < 0.001$.

Despite statistically significant it is necessary to evaluate the models adjustment quality, this aims to evaluate how well the theoretical model is capable of reproducing the correlational structure of the manifested variables in the sample under study. As we can see from Figure 5, the adjustment quality of the model is good. The quality measures CFI, GFI and TLI are all above 0.90, chi-square test has a p-value above 0.05 and X^2 / gl has a value between 1 and 2, also an indicator of a good adjustment quality. A RMSEA value of 0.086 is an indicator of only an acceptable adjustment but overall the adjustment quality is good (Marôco, 2014).

Figure 5 Adjustment quality tests

X2=1,224; p=,298; X2(/gl)=1,224
CFI=,981; GFI=,922; TLI=,944;
RMSEA=,086; P[rmsea<=0.05]=,337

The model presents a good fit, demonstrating its configurational invariance. Next, it is necessary to verify if the factorial weights and the correlations are invariant between the two groups, that is, if the importance of each factor is the same. We will, therefore, carry out the weak invariance analysis measure fixing, simultaneously, all the free parameters of the model (measurement weights, structural covariance's and measurement residuals). According to Tables 7, 8 and 9 all p-values are higher than 0.05 so the unconstrained model is the best fit, proving to be invariant between non-innovative and innovative enterprises.

Table 7 Assuming model unconstrained to be correct

Model	*DF*	*CMIN*	*P*	*NFI Delta-1*	*IFI Delta-2*	*RFI rho-1*	*TLI rho2*
Measurement weights	3	.330	.954	.006	.006	–.096	–.120
Structural covariances	4	1.554	.817	.026	.028	–.084	–.105
Measurement residuals	8	5.809	.669	.097	.104	–.067	–.083

Table 8   Assuming model measurement weights to be correct

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural covariances	1	1.225	.268	.021	.023	.012	.015
Measurement residuals	5	5.480	.360	.092	.104	.029	.037

Table 9   Assuming model structural covariances to be correct

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement residuals	4	4.255	.373	.071	.082	.017	.022

Relatively to the strategies variables, an independent samples t-test is going to be performed to determine if their values are statically different between innovative and non-innovative enterprises. The results of this test are in Tables 10 and 11.

Table 10   Group statistics

	Tipo de empresa	N	Mean	Std. deviation	Std. error mean
S1	Non-innovative	16	16.431	14.4984	3.6246
	Innovative	16	14.675	13.5226	3.3806
S2	Non-innovative	16	45.725	12.4371	3.1093
	Innovative	16	52.763	10.5094	2.6274
S3	Non-innovative	16	27.356	8.3150	2.0787
	Innovative	16	41.344	9.9819	2.4955
S4	Non-innovative	16	49.513	14.5894	3.6474
	Innovative	16	56.394	11.6073	2.9018
S5	Non-innovative	16	12.619	6.0524	1.5131
	Innovative	16	35.056	6.4970	1.6242
S6	Non-innovative	16	23.281	8.4027	2.1007
	Innovative	16	36.944	8.4457	2.1114
S7	Non-innovative	16	15.306	6.0934	1.5234
	Innovative	16	27.931	9.2823	2.3206
S8	Non-innovative	16	14.463	5.5013	1.3753
	Innovative	16	26.231	8.5329	2.1332

Table 10 has the descriptive statistics and Table 11 the independent samples t-test. In Table 10 is possible to verify that innovative enterprises value all strategies more than non-25 innovative ones, the exception is S1 in which non-innovative enterprises have 16.43% versus 14.68% in innovative ones. As in all strategies the p-value of Levene's test is higher than 0.05 (Table 11), equal variances are assumed in all cases and the independent samples test is obtained in the first line. According to the results S1, S2 and S4 are not statistically different, while S3, S5, S6, S7 and S8 are statistically different.

The obtained results are identical for SMEs with a number of employees between 10 and 49 (Appendix).

Table 11 Independent samples test

| | | Levene's test for equality of variances | | t-test for equality of means | | | | | 95% confidence interval of the difference | |
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
S1	Equal variances assumed	.355	.556	.354	30	.726	1.7563	4.9565	–8.3662	11.8787
	Equal variances not assumed			.354	29.856	.726	1.7563	4.9565	–8.3683	11.8808
S2	Equal variances assumed	.598	.445	–1.729	30	.094	–7.0375	4.0707	–15.3510	1.2760
	Equal variances not assumed			–1.729	29.188	.094	–7.0375	4.0707	–15.3607	1.2857
S3	Equal variances assumed	.454	.506	–4.307	30	.000	–13.9875	3.2479	–20.6205	–7.3545
	Equal variances not assumed			–4.307	29.051	.000	–13.9875	3.2479	–20.6296	–7.3454
S4	Equal variances assumed	1.535	.225	–1.476	30	.150	–6.8813	4.6609	–16.4000	2.6375
	Equal variances not assumed			–1.476	28.557	.151	–6.8813	4.6609	–16.4203	2.6578
S5	Equal variances assumed	.022	.883	–10.108	30	.000	–22.4375	2.2198	–26.9710	–17.9040
	Equal variances not assumed			–10.108	29.850	.000	–22.4375	2.2198	–26.9719	–17.9031
S6	Equal variances assumed	.119	.732	–4.587	30	.000	–13.6625	2.9784	–19.7453	–7.5797
	Equal variances not assumed			–4.587	29.999	.000	–13.6625	2.9784	–19.7453	–7.5797
S7	Equal variances assumed	2.639	.115	–4.548	30	.000	–12.6250	2.7759	–18.2942	–6.9558
	Equal variances not assumed			–4.548	25.903	.000	–12.6250	2.7759	–18.3320	–6.9180
S8	Equal variances assumed	2.414	.131	–4.637	30	.000	–11.7687	2.5381	–16.9523	–6.5852
	Equal variances not assumed			–4.637	25.633	.000	–11.7687	2.5381	–16.9896	–6.5479

5 Discussions

The performed multigroup analysis allowed to demonstrate that the assumption of H1 was correct, since innovative and non-innovative SMEs goals are similar. This might be explain by the fact that the majority of SMEs face many difficulties, either lack of finance, competitive pressure, lack of resources to invest or lack of support institutions. As all goals tested reflect situations that can improve the financial conditions of enterprises (decrease in costs, increase in market share, increase in profit margins and increase in turnover) all enterprises value them, either it is an innovative or a non-innovative one. These goals also reflect situations that contribute to enterprises survival and growth, which are two fundamental concerns of almost all SMEs and, according to the results, not exclusively of non-innovative ones. But the ways (strategies) these two types of enterprises use to achieve their goals are indeed different.

In what concerns to the strategies that were tested in the structural equation model it is possible to conclude that none of them prove to be statistically significant in the initial model, suggesting that clear significant differences exist between innovative and non-innovative enterprises strategies. The independent samples t-test shows that both innovative and non-innovative enterprises had statistically similar values in what regards the following strategies:

- enterprises that consider building alliances highly important

- enterprises that consider reducing costs of purchased materials, components or services highly important

- enterprises that consider reducing in-house costs of operation highly important.

The above strategies also represent situations that have a financial impact without, necessarily, assuming innovative actions, since alliances may or may not be directed to innovation. Like we have seen, reducing costs is an important factor for SMEs and even alliances can be form with that in mind. Enterprises that consider building alliances highly important was the only strategy with a higher incidence in non-innovative enterprises but given the small difference to innovative enterprises it was not considered statistically different. On the other hand, the fact that non-innovative enterprises value alliances may suggest that they consider themselves to be fragile in current market conditions and that alliances would be a form to strengthen their position. If non-innovative enterprises value these alliances because of their innovative potential is a question that we cannot answer with the current data.

The remaining strategies were proven statistically different and with a higher incidence in innovative enterprises. Let us remember what strategies we are talking about:

- enterprises that consider increasing flexibility/responsiveness highly important

- enterprises that consider introducing new or significantly improved goods or services highly important

- enterprises that consider developing new markets within Europe highly important

- enterprises that consider developing new markets outside Europe highly important

- enterprises that consider intensifying or improving the marketing of goods or services highly important.

The results show that H2 is partially correct since five strategies are indeed statistically different between innovative and non-innovative enterprises while three are statistically similar.

According to the results, it is possible to confirm that innovative enterprises are more flexible than non-innovative ones and that they value more strategies related to new goods, services or new forms of marketing. They also value more internationalisation strategies what is not surprising since internationalisation is affects innovative activities and vice versa. These results are in accordance with the performed literature review. Although with lower averages than innovative enterprises, the percentage of non-innovative enterprises that also values these more innovative strategies is surprising (see Table 12), which may indicate that they recognise the importance of such practices but, probably, do not have the means to pursue them (human, financial or institutional support).

Table 12 Strategies and non-innovative SMEs

Strategies	Percentage of non-innovative SMEs valuing these strategies
Enterprises that consider increasing flexibility/responsiveness highly important	27.36
Enterprises that consider introducing new or significantly improved goods or services highly important	12.62
Enterprises that consider developing new markets within Europe highly important	23.28
Enterprises that consider developing new markets outside Europe highly important	15.30
Enterprises that consider intensifying or improving the marketing of goods or services highly important	14.46

Since results between both groups of SMEs are identical, it is possible to conclude that, in this case, size has no impact in SMEs goals and strategies.

6 Conclusions

Using a multigroup analyses followed by an independent samples t-test, this study allows to confirm that industrial SMEs, either innovative or non-innovative ones, have similar goals. On the other hand it allowed to confirm that these enterprises value different strategies. The more 'traditional' strategies are statistically similar between both types of enterprises but the more bold strategies are more common in innovative enterprises. The study has also shown that despite not being innovative, a significant percentage of enterprises values innovative strategies. This factor is important to direct public policies to these enterprises in order to boost innovation, since the more innovative enterprises exist, the more innovations will occur (Carvalho et al., 2015). On the other hand, the study identifies the more common strategies of industrial innovative SMEs, also allowing to guide public policies and managers' decisions in order to increase the number of

innovative enterprises present in the market or in order to accelerate the passing of a non-innovative to an innovative enterprise.

Innovative enterprises value more internationalisation strategies with a focus in grubbing new markets, they also value new products and services. Like we have seen, not only new products are important but also new services with a focus in the costumer. Despite being, by nature, more flexible then non-innovative enterprises, innovative industrial SMEs also value to increase their flexibility and response time, again showing a concern towards costumers but also to market. An interesting finding of this study was that, despite not being innovative, many SMEs value innovative strategies, recognising their importance, which may lead us to believe that they do not pursue these innovative strategies due to the constrains that we have previously identify so, future public policies should focus on overcoming these constrains in order to increase the number of innovative enterprises present in the economy.

This study has both theoretical and managerial implications. Theoretical because it allowed to uncover similarities and differences between goals and strategies of innovative and non-innovative enterprises. Managerial because it demonstrates what kind of goals and strategies are more valued by innovative enterprises, providing clues to managers of non-innovative enterprises who want to became innovative.

This research limitations are related with the sample being only constituted by industrial SMEs and is limited by the goals and strategies present in CIS 2012. Other goals and strategies might also be important and might have been neglected in this study. With this in mind, future research should take in consideration additional goals and strategies as well as additional sector and sizes of enterprises in order to validate these results. Specifically, services sector and large enterprises are a good place to start testing the methodology used in this study. Other research directions might be test which goals and strategies have a greater impact in performance, in concrete, financial performance that, like we have previously seen is of major importance to SMEs. The reason why non-innovative enterprises value alliances is also a good research question, is this due to their weak market conditions or due to their desire to pursue innovative activities? Innovative enterprises and strategic management of innovation is a vast field with many research opportunities that need to be addressed so, future research should also focus on some aspects previously identified in the literature: the performance implications of inter-firm collaborations; appropriation strategies; the strategic management of process innovations, administrative innovations, and service innovations; deliberate non-innovation; the causal relationship between internal organisation and innovation; the implementation of innovation; the influence of the ownership structure on innovation strategy; the development of resources for innovatory purposes; alternative measures to capture the performance implications of innovation; environmental contingencies beyond country and industry settings; and the strategic management of innovation in low and medium-technology industries (Keupp et al., 2012). This study confirms that innovative enterprises value strategies that increase their flexibility, internationalisation or innovative potential. Testing a specific sector, in this case industrial SMEs, is an important pass to start uncovering industries segmentation so that public policies that foster innovation might be more effective and directed to a set of enterprises that have the same goals or strategies in mind. Testing other industrial sub-sectors (manufacturing, mining), will allow industrial segmentation, contributing to the improvement of public policies.

This study implications in terms of public policies and managerial decisions were allowing to confirm that innovative enterprises value a set of specific strategies so, public policies must be directed to foster this type of strategies in enterprises. Public funding directed to increase SMEs flexibility, marketing capacities, presence in new markets and development of new products will, probably, increase the number of innovative SMEs. On the other hand, by identifying these innovative strategies, managers can define their enterprises mission to pursue them and increasing the possibilities to pass from a non-innovate enterprise to an innovative one.

Notes

1 The survey can be consulted here http://ec.europa.eu/eurostat/documents/203647/203701/Harmonised+survey+questionnaire+2012/164dfdfd-7f97-4b98-b7b5-80d4e32e73ee

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Appendix

Attachment 1

Results for SMEs with a number of employees between 10 and 49

Table A1   Regression weights: (non-innovative – default model)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
G1 <--- Goals	1.000				
G2 <--- Goals	.663	.126	5.273	***	
G3 <--- Goals	.792	.193	4.108	***	
G4 <--- Goals	1.170	.153	7.662	***	
S1 <--- Strategies	1.000				
S2 <--- Strategies	.814	.418	1.948	.051	
S3 <--- Strategies	−.344	.200	−1.720	.085	
S4 <--- Strategies	−.473	.295	−1.605	.109	
S5 <--- Strategies	3.252	4.096	.794	.427	
S6 <--- Strategies	.258	.144	1.801	.072	
S7 <--- Strategies	.276	.143	1.927	.054	
S8 <--- Strategies	.288	.153	1.882	.060	

Table A2   Regression weights: (innovative – default model)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
G1 <--- Goals	1.000				
G2 <--- Goals	.835	.113	7.357	***	
G3 <--- Goals	.817	.177	4.615	***	
G4 <--- Goals	1.080	.120	9.023	***	
S1 <--- Strategies	1.000				
S2 <--- Strategies	3.966	3.336	1.189	.234	
S3 <--- Strategies	2.544	2.161	1.177	.239	
S4 <--- Strategies	5.103	4.268	1.196	.232	
S5 <--- Strategies	1.632	1.406	1.160	.246	
S6 <--- Strategies	1.325	1.206	1.099	.272	
S7 <--- Strategies	.466	.490	.951	.342	
S8 <--- Strategies	.844	.844	1.001	.317	

Figure A1   Adjustment quality tests

$X2(4)=6,643; X2/gl=1,661; p=,156$
$CFI=,982; PCFI= ,327; GFI=,918; PGFI=,184;$
$RMSEA=,135; P(rmsea<=0.05)=,192; I.C. 90\%],000,,311[$

Table A3   Regression weights: (non-innovative – default model)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
G1 <--- Goals	1.000				
G2 <--- Goals	.656	.122	5.394	***	
G3 <--- Goals	.802	.185	4.323	***	
G4 <--- Goals	1.140	.151	7.567	***	

Table A4   Standardised regression weights: (non-innovative – unconstrained)

	Estimate
G1 <--- Goals	.900
G2 <--- Goals	.855
G3 <--- Goals	.765
G4 <--- Goals	.988

Table A5   Standardised regression weights: (innovative – unconstrained)

	Estimate
G1 <--- Goals	.917
G2 <--- Goals	.935
G3 <--- Goals	.775
G4 <--- Goals	.991

Table A6   Regression weights: (innovative – default model)

	Estimate	*S.E.*	*C.R.*	*P*	*Label*
G1 <--- Goals	1.000				
G2 <--- Goals	.839	.115	7.281	***	
G3 <--- Goals	.816	.179	4.551	***	
G4 <--- Goals	1.087	.123	8.869	***	

Table A7   Assuming model unconstrained to be correct

Model	*DF*	*CMIN*	*P*	*NFI Delta-1*	*IFI Delta-2*	*RFI rho-1*	*TLI rho2*
Measurement weights	3	2.631	.452	.017	.017	–.026	–.028
Structural covariances	4	2.917	.572	.019	.019	–.036	–.039
Measurement residuals	8	3.523	.897	.023	.023	–.063	–.068

Table A8   Assuming model measurement weights to be correct

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Structural covariances	1	.286	.593	.002	.002	−.010	−.011
Measurement residuals	5	.893	.971	.006	.006	−.037	−.040

Table A9   Assuming model structural covariances to be correct

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho-1	TLI rho2
Measurement residuals	4	.606	.962	.004	.004	−.027	−.029

Table A10   Group statistics

	Type	N	Mean	Std. deviation	Std. error mean
S1	0	19	14.547	15.7786	3.6199
	1	19	15.311	12.6246	2.8963
S2	0	19	37.458	12.1235	2.7813
	1	19	45.037	14.4590	3.3171
S3	0	19	22.758	8.5903	1.9707
	1	19	37.763	10.2585	2.3535
S4	0	19	38.495	14.2826	3.2767
	1	19	46.726	17.1665	3.9383
S5	0	19	11.379	5.4501	1.2503
	1	19	30.774	7.4363	1.7060
S6	0	19	14.284	5.5181	1.2659
	1	19	25.705	8.2689	1.8970
S7	0	19	8.363	4.3824	1.0054
	1	19	16.400	4.6080	1.0571
S8	0	19	12.400	5.1235	1.1754
	1	19	25.089	7.3101	1.6771

Table A11   Independent samples test

| | | Levene's test for equality of variances | | t-test for equality of means | | | | | 95% confidence interval of the difference | |
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
S1	Equal variances assumed	.953	.336	−.165	36	.870	−.7632	4.6359	−10.1653	8.6389
	Equal variances not assumed			−.165	34.347	.870	−.7632	4.6359	−10.1810	8.6547
S2	Equal variances assumed	.244	.624	−1.751	36	.089	−7.5789	4.3289	−16.3583	1.2004
	Equal variances not assumed			−1.751	34.938	.089	−7.5789	4.3289	−16.3676	1.2097
S3	Equal variances assumed	.544	.466	−4.888	36	.000	−15.0053	3.0696	−21.2308	−8.7798
	Equal variances not assumed			−4.888	34.923	.000	−15.0053	3.0696	−21.2374	−8.7731
S4	Equal variances assumed	.232	.633	−1.607	36	.117	−8.2316	5.1231	−18.6218	2.1586
	Equal variances not assumed			−1.607	34.847	.117	−8.2316	5.1231	−18.6337	2.1706
S5	Equal variances assumed	.721	.401	−9.169	36	.000	−19.3947	2.1151	−23.6844	−15.1050
	Equal variances not assumed			−9.169	33.007	.000	−19.3947	2.1151	−23.6980	−15.0915
S6	Equal variances assumed	1.185	.283	−5.008	36	.000	−11.4211	2.2806	−16.0464	−6.7957
	Equal variances not assumed			−5.008	31.379	.000	−11.4211	2.2806	−16.0702	−6.7720
S7	Equal variances assumed	.065	.800	−5.509	36	.000	−8.0368	1.4589	−10.9956	−5.0781
	Equal variances not assumed			−5.509	35.910	.000	−8.0368	1.4589	−10.9959	−5.0778
S8	Equal variances assumed	1.861	.181	−6.196	36	.000	−12.6895	2.0479	−16.8429	−8.5360
	Equal variances not assumed			−6.196	32.246	.000	−12.6895	2.0479	−16.8598	−8.5192