

NEW PERSPECTIVES REGARDING CHANGE AND INNOVATION INTO ROMANIAN SMES

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Abstract: *Innovation is one of the major factor to contribute to success and competitiveness on an SMES, as these enterprises are vital for a healthy and sustainable economy. Literature consider innovativeness as one of the most important agent through which such businesses contribute to economic development. This is an even more important issue for country such Romania, where SMEs are often faced with inadequate business infrastructure and lack of support for entrepreneurs. We also consider that last years have been characterized by an increasingly dynamic, complex and unpredictable environment for businesses. Intense competition in the global market is compelling SMEs to leverage their capabilities and competencies in order to differentiate themselves in the marketplace, and improve their performance. In this paper, we explore factors that drive innovation activities and change in SMEs in Romania, and compare it with findings from other studies. We also consider that implementing changes has positive impact on products/services innovation while applying into specific organizational structures, peculiar on SMEs. In this research four types of product innovation are studied: product, process, line extension and radical radical product innovation. We also consider factors regarding percentage of highly skilled employees (T managers, knowledge oriented white collars), implementation of changed strategy, new/improved managerial techniques , SMEs age, region of developement, company dimension and legal type of organization. To generate additional insight in innovation, we also explore problems and obstacle to innovation and change. Literature considers that it is necessary to continuous change and improve SMES in order to be more sustainable and provide innovative products and services to the market. If SMEs account for over 90% of businesses all over the world, and there is a growing need to create sustainable SMEs, then developing and implementing change is highest in making progress towards sustainability. This study is based on a research conducted on over 800 entrepreneurs from Romanian economy. We try to demonstrate the usability of the presented findings in practice in order to contribute to the development of SMEs in Romania.*

Keywords: entrepreneurship, change, innovation, SMEs, management.

JEL classification: L26, M1, O30, O10

1. Introduction

Small and medium enterprises are considered to be the engine of economic growth and employment (Nicolescu Ovidiu, Nicolescu Ciprian 2008; Ceptureanu et al. 2010). One of the primary means through which SMEs are expected to accomplish this task is by developing innovations in order to create competitiveness both on national and international markets (Nicolescu et al. 2011; Ceptureanu et al. 2010). By innovation, we understand a new or significantly improved product (good or service) introduced to the market as well as new or significantly improved process introduced within the firm. We analyse both incremental and radical product innovations. Incremental innovation refers to

product line extensions or modifications of existing platforms and products, while by radical innovations we mean products that are new to the market as well as for the firm (Radas, Bozici, 2009). Because of the importance of the SME sector in creating economic growth, decision makers are very interested in finding ways to stimulate SMEs in realizing innovations. To this respect, many efforts have been made in that direction during the last few decades (Keizer et al., 2002). Therefore, the first step in devising the right incentives to support innovation in SMEs is an investigation into which factors impact the innovation efforts of SMEs and in which way (Keizer et al., 2002). In this paper, we shed some light on this question by investigating factors that significantly impact innovation in SMEs in Romania. Our data come from a research conducted in 2015 by me and Professor Sebastian Ceptureanu on a sample of 800 SMEs based on data provided by National Trade and Commerce Agency (ONRC). Following Keizer et al. (2002), we define a list of variables and then proceed to examine their significance for innovation in Romanian SMEs. We take relevant firm characteristics (as is usual in the literature), but in addition we include some new variables. We consider organizational and strategic changes because willingness and ability to transform is important for firms which need to improve in order to compete and survive (Ceptureanu et al. 2012). We also investigate the effect of market scope, i.e. firm's dominant market on innovation (dominant market can be domestic or international), as this is an important issue for SMEs. By exploring determinants of innovation, we gain knowledge about what propels an enterprise to innovate. This picture is not complete without the investigation of hampering factors that prevent firms from innovating, that's why we also examine obstacles to innovation.

2. Theoretical background

In recent years a number of studies were conducted with the goal to discover which factors contribute to innovation efforts by SMEs (Keizer et al., 2002). According to Keizer et al. (2002), the factors that have effect on innovation can be divided into internal and external, where internal variables refer to characteristics and policies of SMEs while external variables refer to opportunities that SME can seize from its environment. Among the internal factors shown to be the most important determinants of innovative activity are high incidence of qualified employees, strong leadership provided by a highly educated director or founder (Hoffman et al., 1998; Le Blanc et al., 1997), although some studies do not find that effect (Keizer et al., 2002). Among other internal factors, Oerlemans et al. (1998) report that existence of technology policy instruments in the company and planning for the future are internal factors linked to innovation efforts. Meer et al. (1996) claim that application of project management structures has bearing on the innovation activities. Strategy is another internal factor that is shown to have impact on innovation in SMEs. In particular, Birchall et al. (1996) mention explicit strategies to increase and stimulate internal creativity and risk taking behaviour. Yet another internal variable is investments in R&D (Birchall et al., 1996; Oerlemans et al., 1998). Among other internal factors that were found to be important determinants of success of innovative efforts are the nature of the commercialization and marketing effort, the degree of marketing involvement in product planning and firm competence in the area of technology strategy and technology management (Hoffman et al., 1998). Regarding external factors, Keizer et al. (2002) group them into three sets: collaboration with other companies, linkages with knowledge centres and utilizing financial resources or support regulations. Entrepreneurs consider collaboration with other firms as a very important part of their innovation efforts (Massa and Testa, 2008). In particular, Kaminski et al. (2008) show that collaboration with suppliers can contribute to innovativeness of SMEs. Collaboration with suppliers may also have the goal to overcome size constraints as reported in Lipparini and Sobrero (1994), while collaboration with both suppliers and customers may be performed for the purpose of

codesign (Davenport and Bibby, 1999). Collaboration with customers can be a source of improved technology (Le Blanc et al., 1997). Strategic alliances are also shown to be important influencers of innovative efforts when they are integral part of firm's development plan (Cooke and Willis, 1999). Linkages with knowledge centres include contributions by professional consultants, university researchers and technology centres (Oerlemans et al., 1998), as well as contribution by innovation centres and Chambers of Commerce. Regarding variables which relate to utilizing financial resources or support regulations, availability of R&D funding was shown to be an important influencer of innovative efforts in SMEs (Hoffman et al., 1998). Most of these studies explore just one or a few of the mentioned variables, except for Keizer et al. (2002) who consider a list of both internal and external variables. Although for most of the described variables, the suggestion is that they have a direct and a positive effect on innovative efforts (Keizer et al., 2002), there is no absolute consensus on that. For example, while Hoffman et al. (1998) report that internal factors have more bearing on innovation than external factors, Keizer et al. (2002) find a limited number of both external and internal variables that have a significant influence on innovation efforts where external factors prevail. Even for a particular factor, different studies may yield different results. For example, regarding the education level of employees and managers, Keizer et al. (2002) find in their study of mechanical and engineering sector SMEs that neither the education of the manager nor the percentage of employees with high education is significant in explaining innovative efforts, which is contrary to prior research (Hoffman et al., 1998). Contradictory results were also found regarding linkages with sources of knowledge, as reported by Hoffman et al. (1998). Similarly, different views exist on the role of financial funding (Hoffman et al., 1998) and the proportion of turnover spent on R&D (Oerlemans et al., 1998; Birchall et al., 1996). All these findings point to the fact that it is still unresolved which variables influence innovation efforts in SMEs and in which way. Generalizations are difficult due to the complexity of the system we are observing; namely as the behaviour of SMEs differs by industry sectors and geographically, it is hard to infer general rules that would hold across the board (Ceptureanu et al. 2012). One way to learn more about determinants of innovative efforts in SMEs is to conduct a variety of studies under diverse economic conditions and in different geographical areas.

3. Research methodology and results

The data presented in this study were collected as part of joint research between me and professor Ceptureanu from Bucharest University of Economic Studies and National Trade Agency of Romania (ONRC). The companies were chosen depending on two characteristics: main activity and number of employees. The data were collected by online survey. We define SME as a firm employing between 1 and 250 people exclusively IT industry because we consider this domain particular attractive for innovation (fast growth market, highly skilled workforce, focus on highly innovative services and products etc.). The response rate for the SMEs was 64, 4%. More precisely, after examining and cleaning the data, 800 firms out of 1241 were used in this analysis. Our goal is to find those factors that have significant impact on innovation in SMEs. Further information are listed in the table's below. In this research four types of product innovation are studied: product, process, line extension and radical product innovation. Both incremental and radical innovations have an important role. Managers design incremental innovations to satisfy a perceived market need with products that can be developed in a relatively short period of time (Ali, 1994). The introduction of incremental innovation is critical for the long time survival of firms (Banbury and Mitchell, 1995). On the other hand, radical innovation is a major innovation, the product totally new to the market as well as to the company. It could be based on new technology or on satisfying a latent market need by disrupting incumbent markets (Iyer et al., 2006). Next we focus on defining factors that impact innovation.

Following the work of Keizer et al. (2002), we classify our independent variables as external and internal. Following Meer et al. (1996), as external factors we consider collaboration with universities or research institutes. We introduce an external factor that we add to this analysis, one which has not been investigated in this setting before, is market scope and by that we understand the most important market for the company (local, national or international). For small countries in particular, the market where the firm operates is important for the way business is conducted (Nicolescu Ciprian, Ceptureanu Eduard, 2009). For example, firms that are present only in small local markets can be more complacent and less motivated to innovate than the firms that are active on wider (international) markets. Firms that go international encounter stronger competitors and therefore have to innovate in order to gain and keep their position. Actually, survival on a more competitive market requires a steady stream of innovations. Additional push to innovate comes from the fact that more competitive markets often offer higher incentives for innovation (Sorescu et al., 2003). For a small developing country, the further from the head- quarters the company goes, the harder it becomes to compete because among other things the firm has to solve increasingly complex supply chain, logistic and marketing issues while contending with incumbent companies. In the model, we introduce two dummy variables; one indicates firm's presence on national market and the other indicates its presence on international markets. We also consider factors regarding percentage of highly skilled employees (T managers, knowledge oriented white collars) (Ceptureanu, 2011), implementation of changed strategy, new/improved managerial techniques (Verboncu et al. 2011), SMEs age, region of development, company dimension, legal type of organization and obstacle of innovation.

Table 1: Factors of innovation (no. of respondents)

| Factors | Product innovation | Process innovation | Line extension | Radical product innovation |
|---|--------------------|--------------------|----------------|----------------------------|
| Collaboration with other organizations | 76 | 59 | 12 | 2 |
| Links with universities | 78 | 56 | 1 | 1 |
| Link with research institutes | 121 | 84 | 12 | 3 |
| New products/services on domestic markets | 532 | 123 | 14 | 1 |
| New products/services for international markets | 89 | 59 | 2 | 2 |
| % of highly skilled and educated employee in the company | 32% | 18% | 5% | 1% |
| Implementation of new or significantly changed strategies | 156 | 121 | 0 | 3 |
| Implementation of new, advanced managerial instruments | 207 | 69 | 0 | 0 |

(Source: own research)

Table 2: Differentiation of innovation object depending on the age of SMEs (%)

| No. | Nature of innovation activities | Companies age | | | |
|-----|--|-------------------|------------|-------------|---------------|
| | | Less than 5 years | 5-10 years | 10-15 years | Over 15 years |
| 1. | New products | 41,54 | 36,99 | 42,23 | 42,05 |
| 2. | New technologies | 19,23 | 20,45 | 31,08 | 24,87 |
| 3. | Updated management and marketing systems | 23,85 | 26,21 | 21,12 | 16,41 |
| 4. | Updated information systems | 3,85 | 4,28 | 5,58 | 6,67 |
| 5. | Human resource training | 5,64 | 4,65 | 5,18 | 4,62 |
| 6. | No action | 27,18 | 28,44 | 22,71 | 25,13 |

(Source: own research)

Table 3: Differentiation of innovation object according to SMEs region (Romania) (%)

| No. | Nature of innovation activities | SMEs grouped by region | | | | | | |
|-----|--|------------------------|------------|--------|------------|------------|--------|-----------------|
| | | North East | South-East | South | South-West | North-West | Center | Bucharest-Ilfov |
| 1. | New products | 38,46 | 45,36 | 53,82% | 41,91 | 16,02 | 31,65 | 41,72 |
| 2. | New technologies | 19,23 | 27,84 | 25,08 | 35,97 | 8,84 | 17,09 | 19,95 |
| 3. | Updated management and marketing systems | 11,54 | 7,22 | 11,62% | 20,13 | 44,20 | 30,38 | 24,94 |
| 4. | Updated information systems | 9,62 | 8,25 | 3,06 | 5,28 | 6,63 | 1,90 | 4,99 |
| 5. | Human resource training | 7,69 | 5,15 | 4,59 | 7,26 | 8,84 | 2,53 | 2,72 |
| 6. | No action | 26,92 | 21,65 | 22,94 | 31,35 | 28,18% | 29,11 | 24,04 |

(Source: own research)

Table 4: Differentiation of innovation object according to company dimension (%)

| No. | Nature of innovation activities | Companies dimension | | |
|-----|--|---------------------|-----------------|--------|
| | | Micro enterprises | Small companies | Medium |
| 1. | New products | 38,28 | 45,56 | 55,07 |
| 2. | New technologies | 19,10 | 34,75 | 47,83 |
| 3. | Updated management and marketing systems | 23,21 | 20,85 | 13,04 |
| 4. | Updated information systems | 4,43 | 6,56 | 8,70 |
| 5. | Human resource training | 4,27 | 7,34 | 8,70 |
| 6. | No action | 28,77 | 19,31 | 10,14 |

(Source: own research)

Table 5: Differentiation of object of innovation in SMEs according to legal form of organization (%)

| No. | The nature of innovation activities | Legal form of organization | | |
|-----|--|----------------------------|-------------------|-------------------------|
| | | Public companies | Private companies | Other organization form |
| 1. | New products | 34,38 | 39,99 | 43,62 |
| 2. | New technologies | 46,88 | 23,34 | 14,09 |
| 3. | Updated management and marketing systems | 15,63 | 22,91 | 18,79 |
| 4. | Updated information systems | 18,75 | 4,83 | 3,36 |
| 5. | Human resource training | 9,38 | 5,12 | 2,68 |
| 6. | No action | 12,50 | 25,79 | 34,90 |

(Source: own research)

Table 6: Differentiation of innovation object depending on the performance of SMEs (%)

| No. | The nature of innovation activities | Enterprises performance in 2014 vs precedent years | | | | |
|-----|--|--|--------|-----------|--------|-------------|
| | | Much better | Better | Identical | Weaker | Much weaker |
| 1. | New products | 58,82 | 40,00 | 38,78 | 45,21 | 25,00 |
| 2. | New technologies | 58,82 | 35,56 | 21,34 | 15,34 | 16,25 |
| 3. | Updated management and marketing systems | 11,76 | 22,22 | 24,63 | 20,00 | 15,00 |

| | | | | | | |
|----|-----------------------------|------|--------|-------|-------|-------|
| 4. | Updated information systems | 2,94 | 6,30% | 4,39 | 4,11 | 11,25 |
| 5. | Human resource training | 5,88 | 11,48% | 3,78 | 2,19 | 7,50 |
| 6. | No action | 5,88 | 17,41% | 27,32 | 29,59 | 41,25 |

(Source: own research)

Table 7: Percentage of total investment in innovation in SMEs according to age (%)

| No. | Percentage of total investment in innovation | Companies age | | | |
|-----|--|-------------------|------------|-------------|---------------|
| | | Less than 5 years | 5-10 years | 10-15 years | Over 15 years |
| 1. | 0% | 42,05 | 39,22 | 37,05 | 37,95 |
| 2. | 1 - 5% | 20,26 | 25,65 | 29,08 | 25,13 |
| 3. | 6 - 10% | 24,10 | 22,86 | 17,53 | 24,10 |
| 4. | 11 - 20% | 6,92 | 5,95 | 8,76 | 5,90 |
| 5. | 21 - 50% | 3,08 | 4,28 | 3,98 | 4,62 |
| 6. | 51% - 75% | 3,08 | 1,67 | 2,79 | 1,54 |
| 7. | Over 76% | 0,51 | 0,37 | 0,80 | 0,77 |

(Source: own research)

Table 8: Percentage of total investment in innovation grouped by region (%)

| No. | Percentage of total investment in innovation | SMEs by region | | | | | | |
|-----|--|----------------|------------|-------|------------|------------|--------|-----------------|
| | | North East | South-East | South | South-West | North-West | Center | Bucharest-Ilfov |
| 1. | 0% | 40,38 | 35,05 | 41,28 | 34,65 | 48,07 | 37,97 | 37,87 |
| 2. | 1 - 5% | 13,46 | 36,08 | 36,70 | 9,90 | 14,36 | 27,22 | 28,57 |
| 3. | 6 - 10% | 25,00 | 15,46 | 17,43 | 23,43 | 28,73 | 27,85 | 23,13 |
| 4. | 11 - 20% | 13,46 | 8,25 | 4,28 | 9,90 | 3,87 | 5,06 | 6,80 |
| 5. | 21 - 50% | 5,77 | 3,09 | 0,31 | 12,87 | 1,66 | 1,27 | 2,49 |
| 6. | 51% - 75% | 1,92 | 2,06 | - | 8,25 | 1,10 | 0,63 | 0,68 |
| 7. | Over 76% | - | - | - | 0,99 | 2,21 | - | 0,45 |

(Source: own research)

Table 9: Percentage of total investment in innovation by company size (%)

| No. | Percentage of total investment in innovation | Enterprise size | | |
|-----|--|-------------------|-----------------|------------------|
| | | Micro enterprises | Small companies | Medium companies |
| 1. | 0% | 43,67 | 25,48 | 11,59 |
| 2. | 1 - 5% | 23,93 | 30,50 | 17,39 |
| 3. | 6 - 10% | 21,19 | 24,32 | 42,03 |
| 4. | 11 - 20% | 5,64 | 8,88 | 15,94 |
| 5. | 21 - 50% | 2,98 | 8,11 | 7,25 |
| 6. | 51% - 75% | 2,10 | 2,32 | 2,90 |
| 7. | Over 76% | 0,48 | 0,39 | 2,90 |

(Source: own research)

Table 10: Percentage of total investment in innovation by legal form of organization (%)

| No. | Percentage of total investment in innovation | Legal form of organization | | |
|-----|--|----------------------------|-------------------|-------------------------|
| | | Public companies | Private companies | Other organization form |
| 1. | 0% | 31,25 | 37,46 | 57,72 |
| 2. | 1 - 5% | 21,88 | 26,01 | 13,42 |

| | | | | |
|----|-----------|-------|-------|-------|
| 3. | 6 - 10% | 21,88 | 22,84 | 20,81 |
| 4. | 11 - 20% | 12,50 | 6,70 | 4,70 |
| 5. | 21 - 50% | 3,13 | 4,18 | 2,68 |
| 6. | 51% - 75% | 6,25 | 2,23 | 0,67 |
| 7. | Over 76% | 3,13 | 0,58 | - |

(Source: own research)

Table 11: Internal obstacles regarding innovation

| Internal obstacle | No. of respondents |
|--|--------------------|
| Lack of qualified staff | 521 |
| Lack of information regarding technology | 59 |
| Lack of information regarding market | 98 |

(Source: own research)

Table 12: External obstacles regarding innovation

| External obstacles | No. of respondents |
|-----------------------------|--------------------|
| Finance and expenses | 438 |
| Regulation regarding demand | 111 |
| Environment obstacles | 73 |
| Logistics obstacles | 138 |

(Source: own research)

4. Conclusions

We find out that innovation efforts in SMEs focused mainly on new products (40.22%), new technologies (22.94%), managerial and marketing approaches us (22.37%), upgrading the computer system (4.97%), and human resources training (4.97%), while one in four companies is recorded absence innovative approaches (26.39%). The intensity of investment in product innovation, process and organizational includes the following elements: 39.26% of SMEs have not allocated resources for innovation, while 60.74% of companies dedicated to innovation at least 1% of total investment, 36.01% - more than 6%, 13.38% - 11%, 6.76% - more than 21%, 2.74% - over 51% and 0.57% of organizations have allocated innovation over 76% of total investments. From the perspective of the share in turnover revenue from new products and services introduced in the last year, we find the following: 42.57% of SMEs have received income from sale of products and new services, while 57 43% of companies have charged at least 1% of the total, 37.67% - more than 6%, 21.48% - over 11% - 10.64% - more than 21%, 3.57% - over 51% and 0.70% of organizations indicated that over 76% of turnover comes from new or renewed products and services. The main ways of innovation in SMEs are: adaptation and modification of the innovations originally developed by other organizations (43.86%), individual conduct R & D activities (26.90%), taking full the innovations originally developed by other organizations (24.78%) and cooperation with other organizations on the development of research and development (4.46%). Regarding internal obstacles to innovation we found out that lack of qualified staff is the main issue (65, 12% of responses), while 55% of respondents consider finance and expenses as main external barrier. This findings confirm some results from the literature (Birchall et al., 1996). For instance having links with academic and research institutions has very strong positive effect on radical product innovation, while the effect on other types of innovation is lacking. Kaufmann and Todtling (2000) report similar effect, which is consequence of the fact that radical innovations need creative ideas and advanced knowledge that usually resides in academia and research community. This is congruent with Massa and Testa (2008) finding that for academics only the radical innovation is considered as innovation, while entrepreneurs tend to define the term more broadly. In general, our results confirm those in the literature concerning external

collaboration, in particular the finding from Keizer et al. (2002) about positive effect that links with knowledge centres have on innovation. Presence on national and international market has a strong positive effect on probability to innovate. This finding is in line with the fact that wider markets are more competitive, and survival on more competitive markets requires innovation. Radical innovation, being something completely new to the market, is a much less controllable event than incremental innovation due to much higher level of risk and unpredictability, which is offset by the product's possibility to open up new markets and generate very high profits (Ali, 1994). It is not just the consequences of innovation but also the antecedents that differ. In the study of small firms by Subrahmanya (2005), it is reported that radical innovation depends on internal factors, while incremental innovation depends more on external factors. Regarding internal factors, data show that the proportion of highly educated staff has a positive effect on radical product innovation, while it has no effect on other types of innovation. This is understandable since radical innovations require substantive creative effort, while introducing products that are similar to those already existing on the market does not require as much original input from firm's own staff (i.e. the work can be completed by less-skilled employees) (Ceptureanu et al. 2009). Salavou and Lioukas (2003) show that strategic choices by top management (for example adopting entrepreneurial orientation) have significant positive impact on radical innovation in SMEs. One way to explain this is that entrepreneurial orientation supports proactive new product development that favours novelty, in contrast to defensive strategies that favour imitation. Being risky and expensive, radical product innovation requires time and involvement of the best and the brightest people in the company. To devote all those resources to radical innovation is a deliberate decision that only top management can make.

Acknowledgments

This work was cofinanced from the European Social Fund through Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/159/1.5/S/142115 „Performance and excellence in doctoral and postdoctoral research in Romanian economics science domain”.

Această lucrare a fost realizată în cadrul proiectului POSDRU/159/1.5/S/142115 cu titlul "Performanță și excelență în cercetarea doctorală și postdoctorală în domeniul științelor economice din România", cofinanțat din Fondul Social European prin intermediul Programului Operațional Sectorial Dezvoltarea Resurselor Umane 2007 – 2013.

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