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#### INNOVATION INTO ROMANIAN SMALL AND MEDIUM ENTERPRISES





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#### **ABSTRACT:**

Innovation is one of the major factors to contribute to success and competitiveness on an SMES, as these enterprises are vital for a healthy and sustainable economy. Literature considers innovativeness as one of the most important agents through which such businesses contribute to economic development. This is an even more important issue for country such

Romania, where SMEs is often faced with inadequate business infrastructure and lack of support for entrepreneurs. We also consider that the 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 the 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 a positive impact on product/service 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 the percentage of highly skilled employees (T managers, knowledge oriented white collars), implementation of change strategy, new/improved managerial techniques, SMEs age, region of development, 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 continuously 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.

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#### JEL classification: L26, M1, O30, O10

#### **1.INTRODUCTION**

Small and medium enterprises are considered to be the force behind the 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 or introduced to the market have the same importance as new or significantly improved process introduced within the firm. Because of the importance of the SME sector in creating economic growth, decision makers are very interested in finding ways to stimulate SMEs activities in order to realize innovation processes. In this paper, we give found answers on this question by investigating factors that significantly impact innovation processes 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 that were used in the our study in order to examine them significance on innovation processes 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 orer to compete and survive (Ceptureanu et al. 2012). We also investigate the effect of market scope, i.e. firm's dominant market for innovation (dominant market can be domestic or international), as this is an important issue for SMEs. By exploring determinants of innovation processes, we obtain enough 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 explored the obstacles that can hinder the innovation.

#### 2.THEORETICAL BACKGROUND

In recent years a number of studies were conducted in Romania, with the scope to identify which factors contribute to innovation efforts by Small and Medium Enterprises. Keizer (2002) suggested that the factors that have effect on innovation can be divided into two types of variables: internal and external. The internal variables refer to specifications and policies of SMEs while external variables refer to opportunities and threats that SME can seize or evade from its environment. The most important determinants of innovative activity are represented by highly qualified employees, strong leadership provided by a highly educated director or founder (Le Blanc et al., 1997). Among other internal factors, Oerlemans et al. (1998) suggested that the existence of an efficient technology policy in the company which will influence the 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 a serious impact on innovation capabilities of SMEs. Also, another important internal variable is represented by the investments in R&D (Birchall et al., 1996). Regarding external factors, Keizer et al. (2002) group them into three sets: collaboration with other companies, linkages with knowledge centres and utilizing

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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 the 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 the 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 contributing 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 influence 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

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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 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 (lyer 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 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 developement, company dimension, legal type of organization and obstacle of innovation.

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

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

(Source: own research)

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

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

No.	Nature of	SMEs grouped by region						
	innovation activities	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
	New technologies	19,23	27,84	25,08	35,97	8,84	17,09	19,95
	Updated management and marketing systems	11,54	7,22	11,62%	20,13	44,20	30,38	24,94
	Updated information systems	9,62	8,25	3,06	5,28	6,63	1,90	4,99
	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

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

(Source: own research)

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

No.	Nature of innovation activities	Companies dimension				
		Micro	Small	Medium		
1.	New products	enterpreses	compaties	companies		
2.	New technologies	19,10	34,75	47,83		
	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	Legal form of organization					
	activities	Public	Private	Other			
		companies	companies	organization			
1.	New products	34,38	39,99	43.62			
2.	New technologies	46,88	23,34	14,09			
3.	Updated management and	15,63	22,91	18,79			
4.	Optime of the 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			

No.	No. The nature of innovation		Enterprises performance in 2014 vs					
	activities	Much	Better	<b>leteletit</b> al	Weaker	-		
1.	New products	better 38,82	40,00	38,78	45,21	weaker 25,00		
2.	New technologies	58,82	35,56	21,34	15,34	16,25		
	Updated management and marketing systems	11,76	22,22	24,63	20,00	15,00		
4.	Updated information	2,94	6,30%	4,39	4,11	11,25		
5.	Hysteams 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		

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

(Source: own research)

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

No. Percentage of total Companies age					
	investment in innovation	Less than 5	5-10	10-15	Over 15
1.	0%	¥ 2,005	<b>years</b>	BÇQOS	<b>\$</b> 7,3 <b>7</b> 5
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	SMEs by region						
	total investment in innovation	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

No.	Percentage of	Enterprise size					
	total investment in	Micro	Medium				
1.	0% innovation	ent <b>43</b> perises	companies	companies			
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.	Peste 76%	0,48	0,39	2,90			

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

#### (Source: own research)

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

No.	Percentage of	Legal form of organization		
	total investment	Public	Private	Other
1.	<sub>0%</sub> in innovation	companies	companies	organizațion form
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

#### 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.

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