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INNOVATION IN THE EUROPEAN VALUE CHAIN: THE CASE OF THE ROMANIAN AUTOMOTIVE INDUSTRY***

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Abstract: *Entrepreneurs' and regional stakeholder's capacity to turn knowledge, skills and competencies into sustainable competitive advantage is crucial to a region's economic performance. The article attempts to reveal their synergy by gathering evidence in the particular context of the Romanian automotive industry. Based on primary data collected through structured interviews and experiential visits, the research is organized around three investigative themes: (1) entrepreneurs' approach to and perception on innovation, (2) factors affecting innovation, and (3) networking and knowledge diffusion in the regional productive environment. The findings emphasize the convergent opinion of the regional stakeholders on the vital role innovation plays at the current stage of the industry and the key role entrepreneurs have in stimulating innovation in the regional context. A series of three factors underlay the innovative performance at regional and industry level, namely the presence of an innovation friendly business environment, entrepreneurs' personality, as well as the external competitive environment.*

Keywords: automotive, entrepreneurship, technology, innovation, Romania

JEL Classification: L62, O03

Introduction

Entrepreneurship and innovation are staples of any business schools' curricula. The pair concept has been studied for sufficiently long time to suggest that policy makers are left with the only option of considering their circular causation on their economic agenda. However, the researchers have yet to investigate the conditions under which the reciprocal influence is most likely to eventuate in a virtuous circle, or, alternatively, to escape a vicious one.

Attempts to place the two concepts in a territorial context – for example, at which level, national or regional, is it more appropriate to spur innovation and encourage entrepreneurship? – add more issues to the debate. The National Innovation Systems literature of the 1970s has been lately supplemented with increasing evidence pointing to the positive effect of the geographic and institutional proximity of stakeholders involved in generating innovation. Entrepreneurs' and regional decision makers' capacity to turn knowledge, skills and competencies into sustainable competitive advantage is crucial to a region's economic performance and thus new knowledge provides solid ground for facilitating their interaction and support agglomeration effects.

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This paper attempts to reveal their synergy with the help of a case study on the automotive industry in Romania in a regional context, in particular at the level of its southern region, Muntenia. The analysed region is of particular interest because most of the industry players are located here along an almost full-fledged value chain: from international and local suppliers, most of them as members of two out of the three national institutionalized sectoral clusters (i.e. Pol Auto Muntenia and Sprint Acarom) to a major assembler (Renault-Dacia plant in Mioveni), two technical universities and research institutes. The Muntenia region ranks second in terms of national RDI resources: it accounted for 9.3% of RDI average expenditure in 2007-2010 (Eurostat), 6.1% of RDI units (INS 2009), and 9.6% of the Romania's RDI employees (Eurostat).

The overall automotive industry accounts for a sizable part of the Romanian economy with a turnover of about €16.86 bn in 2013 (ca. 11% of GDP) and a share of 24% of country exports (ACAROM). Also, it ranks first in terms of competitiveness among other national sectors (Munteanu *et al.* 2012, pp. 53-54) due to a spectacular rise after 1989 in terms of export share, and as an innovative sector. The value of automotive exports has grown exponentially in the last decade (from 0.44 billion Euros in 2003 to 7.07 billion in 2013), significantly supporting the growth of the Romanian economy.

As for the innovative relevance of the industry, the setting up of the largest Renault's foreign research centres in Romania in 2006 has revitalized at high level RDI activities in the industry. Led largely by Romanian managers and employing 2.300 engineers, Renault Technologie Roumanie (RTR) is responsible with development and innovation for Dacia- Renault's Entry range and has design, testing and manufacturing platforms. At the same time, there is a complex research infrastructure supporting the sector: 11 technical universities and private research undertaken by international suppliers that have relocated part of their RDI activity here (e.g. Continental, Siemens and Ina Schaeffler). Briefly, Romania not only assembles around 1 million vehicles per year, but it also develops the ability to design them.

Romania is associated to the success story of building a new generation of low budget cars, the cheapest cars in Europe (i.e. Logan and Sandero). Furthermore, specialists (*e.g.* Govindarajan and Dubiel 2010, Haddock and Jullens 2009) point to Logan as a powerful example of *reverse innovation* (i.e. breakthrough innovations happen first in poor countries and those innovations subsequently are taken to rich countries) and part of the reasons rely on the gradual shift of product development responsibility to Renault's R&D centre in Romania.

The Romanian automotive industry seems to be in the convenient position of having the right product at the right timing and targeting two growing segments: the unsaturated emerging markets

and the growing WE demand for lower cost vehicles. Nevertheless, there are two major challenges threatening the current advantage: on one hand, the competition on the low cost segment coming from both Asian countries (China with Chery and Geely, India's Tata Motors with the \$ 2,500 Nano model) and from traditional OEMs (e.g. Volkswagen, Toyota, GM). On the other hand, innovation in the global automotive industry is intensifying and the automobile industry has entered an innovation race. The dynamics of the automotive industry have never been greater: automakers spend more than \$100 billion annually on research and development (R&D) and fourteen automakers are among the top 50 most innovative companies in the world according to BCG's 2013 survey, compared with only five in 2005. Three companies (Toyota, Ford, and BMW) rank in the top 10, and nine automakers are in the top 20. At the European level, the automotive sector is the largest investor in R&D with investments of over €32 billion (around 25% of total R&D spending) and 10,500 patent applications registered each year (ACEA, 2014).

Is the Romanian car industry ready to change and accelerate its adaptability and pace of innovation? Innovation scoreboards place Romania under the category of “modest performers” in terms of innovation with scores well below the EU average for almost all indicators. Still, Romania has registered a growth performance (1.9%) above the EU average (Innovation Union Scoreboard 2014, p.4) and remains the most innovative country in its performance group. Good scores are related to economic effects of innovation, innovators and human resources, while improvements are needed in aspects concerning R&D expenditures in the business sector, open, excellent and effective research systems, finance and support, linkages and entrepreneurship.

Against this background, the role of innovation and entrepreneurship serves as the organizing theme of this paper.

1. Literature review

Entrepreneurship and innovation are apparently creating an established conceptual pair, with causal effects running both ways. In light of Schumpeter's (1961, 1934) and Drucker's (1986) views of entrepreneurship, they are even perceived as overlapping concepts. In fact, little consensus has been reached among scholars concerning terms and definitions clearly distinguishing between innovative and entrepreneurial activities (Garcia and Calantone 2002; McFadzean *et al.* 2005). The inconclusive result is still an answer though and points to a considerable space of interaction between the two.

A common portrait depicts the innovative entrepreneur of possessing, “an active component comprising the entrepreneur’s propensity to drive innovation and an absorptive component comprising the entrepreneur’s capacity to recognise and welcome innovation delivered by external factors” (OECD, 2010).

On the “active” side, entrepreneurial discovery plays a variety of roles in innovation. Kirzner (1997) defines the role of the entrepreneur as the “opportunity identifier”, the one in charge with the discovery and early exploitation of previously unexploited opportunities. In Knight’s (1921) perspective, the entrepreneur is the “risk taker” that anticipates new profit opportunities, takes the risk of launching new solutions to the market and deals with the uncertainty whether they will be profitable or not. Drucker (1985) perceives the entrepreneur as the “resource shifter” and points to the way entrepreneurs relocate resources in their attempt to improve productivity level, endowing existing resources with new wealth-creating capacity.

On the “absorptive” side, innovation is directly related to performance and mediates in the entrepreneurship - performance link (e.g. Smith, 2006; Deakins and Freel, 2006; Fang Zhao 2005, Kohtamäki *et al.*, 2004). According to Brazeal and Herbert (1999, pp. pp. 29-34) innovation and entrepreneurship can be seen as both a process and its end-result. In other words: “the end of an innovation is the starting point for entrepreneurship” (Mets 2005, pp. 263–273).

Felicitous though the dual relationship may appear, it is still dependent on the actual organisational capability to make it a workable business strategy. Covin (1999, pp. 47–64) argues that the presence of innovation per se is not enough to rate a firm as entrepreneurial. Only firms that use innovation as a mechanism to redefine or rejuvenate themselves, their positions within markets and industries, or the competitive area in which they compete should be classified like entrepreneurial.

Translated into the context of the automotive industry, the analysis should focus on the role entrepreneurs play in generating innovation in a mature industry facing radical technological changes. The industry is shifting towards a new paradigm and the increasing pace of innovation determines entrepreneurs to deal with new unfamiliar sets of approaches and decisions related to the development and application of new technologies.

Uncertain and fast technological changes, long development cycles, highly research intensive product development, saturated markets and production overcapacities, environmental and safety regulations have lead to major transformations in the sector. The general belief among auto executives is that “stagnation means regression to innovation management in the automotive

industry” and that innovation is the answer to most of the global challenges the industry faces and the key factor for a strong competitive position (O. Wyman, 2007, p. 4).

Empirical and theoretical evidence emphasize a set of areas that companies in the industry need to address with a sense of urgency: cost reduction, the acceleration of innovation cycles, expansion of available products and technologies, creating collaborative networks and clusters, energy and environmental issues (Automotive Cluster – West Slovakia in Trnava, 2010, Mosquet *et al.*, 2014). Overall, there are two main types of immediate challenges concerning innovation entrepreneurs must find solution to: business development and technical issues.

First, the sector has changed lately from capital to research intensive. Several of its breakthroughs, for example in the fields of safety, new materials, hybrids and electric cars etc., represent the effort of inter- and intra-industry linkages. RDI activities are resource consuming and involve collective efforts and that is why building R&D networks that facilitate OEM-supplier and industry-academia collaboration, ease cooperation on common research projects and facilitate cost innovations in a way that takes better advantage of the local resources of regional economies is a prerequisite for innovation performance. There has been a change including within innovation networks: there is a shift towards an increased role of tier-one suppliers in matters of powertrains, interior design, chassis components, connectivity and active-safety features (Mosque *et al.*, 2014) and new actors are involved in producing the final product (e.g. Electronics and Software suppliers, Telecoms providers, Location-based service providers) (Juliussen and Robinson, 2010). The number and type of participants, the nature of interactions within and between these networks, along with the unstable business environment and a shorter product life cycle generate a high complexity of innovation tasks and decision-making.

Second, cost competition is not *passé*; it will continue to play a crucial role for the industry’s future growth as many new competitors from developing countries have developed the ability to compete globally and the segment of low cost cars is taking over. The competitive landscape has enriched with at least three fast growing players: China, India and Brazil attempt to compete with Western Europe, Japan, Korea, and the United States in designing and manufacturing vehicles. Car producers from these countries target not only emerging markets (e.g. Russia, the Middle East and Africa), but also European and American markets and their prices push traditional OEMs and suppliers to redesign strategies and re-evaluate resource allocation (e.g. Tata Motors has already introduced the \$ 2,500 Nano car) (Roland Berger, 2008). On the other hand, there is an increasing focus on the low-cost segment cars that are available at a price difference of up to 30 percent lower, forcing traditional car makers to rethink business models and adapt to market trends if they are to

remain relevant in this dynamic and evolving automotive industry. Renault's changes in the value chain represent a pattern for other companies by proving that is essential for the entire value chain to be adequately configured, and not only by choosing low wage production site. The cost advantage of a low-wage location can disappear fairly quickly since labour costs in the emerging markets have risen dramatically over the past few years. For instance, producing in Romania has helped Renault to reduce costs by 92 percent compared to France but in 2007 the increase in labour costs in Romania was of 30.2 percent relative to only 3.3 percent in France and 1 percent in Germany. In addition, labour costs in the automotive industry represent only 15 to 25 percent of all production costs so they can be easily offset by higher expenses deriving from lower productivity rate, poorer quality, higher transportation costs or greater difficulty in finding suitable suppliers (Schmid, and Grosche 2008, p 79). Therefore, locations endowed with labour force capable of delivering innovative solutions at a good cost balance between wages and skills represents part of the answer needed in the struggle for competitive advantage.

The major *technical trends* in innovation regard the shift from mechanical to software-driven vehicles involving a high development of software and electronics systems, new alternative types of engines and auxiliary systems (i.e. the electric car, green cars/ hybrids), and a quickening pace of product development (Mosquet *et al.*, 2014) To face these changes, OEMs will need either to enlarge their R&D capabilities in electronics and software or to decide on a set of selected layers developed in-house and assign the rest to be developed by Tier one suppliers. High consumers' expectations for a rapid pace of innovation will give automakers and their suppliers a hard time to maintain the current three-to five-year product design and development period. Under the circumstances, automakers will have to rely more on alternative design processes and development models, making use of advanced production techniques. In the main, the ability to anticipate consumers' tastes and projections will be crucial in selecting the most valuable innovations and creating a competitive advantage. All of these tasks assess highly qualified labour force, adding competition for talented and skilled professionals to the list of tasks automakers have to fulfil in the near future.

As for the *factors hindering innovation* in the industry, the most frequently invoked are financial factors (the high costs of innovation, supplier's financial power), market factors (the low request for innovative products, the lack of information on technical opportunities, brand competition, fuel prices etc.), and regulatory factors (design protection and intellectual property rights) (ACEA, 2004).

Summing up, major innovation challenges in the automotive sector can be translated into both opportunities and threats depending on the industry entrepreneurs' ability to make capital of the full

innovation potential along the value chain, capture growth in emerging markets and satisfy the increasing demand for alternative transportation ways. On the way automakers manage to build efficient collaboration networks and stimulate suppliers' R&D investment depends the gain of a long-term advantage and of a valuable way of cutting costs while increasing the quality of innovations.

2. Methodology

Primary data were collected from semi-structured interviews and experiential visits that took place between May and August 2014. The investigative design draws on the “subject approach that starts from the innovative behaviour and activities of the firm as a whole exploring the factors influencing the innovative behaviour of the firm and the scope of various innovation activities” (Oslo Manual 2005, p. 104). Identifying actors with particular significance for the automotive sector development provides a strong basis for the substantiation of findings.

The content of the research questions was directed to two major themes: (1) the context of factors promoting or stifling innovation; and (2) entrepreneurs' approach to and perception on innovation, in the particular context of the Romanian automotive industry. The interviewing guide was first piloted with a sector expert with an international career in senior managerial positions within large industrial groups, Mr. Jean-Jacques Le-Goff. It included a series of semi-structured, open-ended questions designed to elicit responses to those themes that would (i) describe the established value chain networks between academia, suppliers, competitors, and support institutions; (ii) shed light to the current technological development and business strategies; (iii) reveal the innovation culture and its relevance to business success and entrepreneurial dynamics.

Interviewees were selected with the intention to capture information from three perspectives: business sector, academia, and consultancy. A series of 16 interviews were conducted with: 11 managers representing the main segments of the production value chain – the car assembler and major local suppliers, 4 researchers from each of the three regional universities and one research institute, and 1 representative of the Association of Automotive Manufacturers from Romania (ACAROM). Companies were identified by following three routes: a preliminary selection based on their turnover and number of employees; suggestions from ACAROM, as a highly knowledgeable informant that views the innovation phenomena from diverse perspectives; and companies from the 'Auto Muntenia Competitiveness Pole' cluster.

After establishing contact with the stakeholders, we sent an interview guideline written both in English and Romanian to allow for increased familiarity with the topic. The interviews were held on

the site and were informal and conversational. The sessions were recorded and written notes were used to record any relevant non-verbal communication. Immediately following the interview, we met and reflected on our own perception of the session.

In the traditional paradigm the researcher is the only one that manages and draws conclusions from the research, while in the case of experiential research participants' interpretations are prioritized and focused on, rather than being used as a basis for analyzing something else (Clarke and Braun, 2013). Experiential research is used to probe the meanings of situations and to report to readers the complexity of the phenomenon (Stake, 2010). Presuming that how activities work is situational represents one of the epistemological strengths of the experiential research. In order to validate the meaning, views, perspectives, experiences and/or practices expressed in data, experiential visits took place at three emblematic sites of the indigenous automotive sector: *Technical Centre* in Titu; *Microelectronica S.A.* in Bucharest, and *the Automobile Engineering Research Centre* in Pitesti.

3. Results and discussion

3.1. Overlook

In Romania, FDI have been responsible for establishing production capacities and linking them to international supply chains. All of the major indigenous automate manufactures were taken over by foreign manufacturers, through privatisation, as the state owned enterprises were sold to foreign investors (Radošević and Rozic 2005, p. 4). Renault S.A. bought a 51% stake in September 1999, which it further increased to 99.3% in 2003. Uzina de Autoturisme Pitesti – Dacia now called Automobile Dacia SA. Romania became a strategic base for Renault's international expansion plans. The company has undergone an extensive modernization program: changes in the industrial plants, commercial network reconstruction and reorganization of the network of suppliers. Currently, the plant is fully modernized and uses Renault Production System, one of the most modern in the auto industry (Dacia group). In 2008 Ford acquired a majority stake in Automobile Craiova, the former Daewoo owned production unit and the production of the Ford Transit Connect started in September 2009 (Ernst & Young).

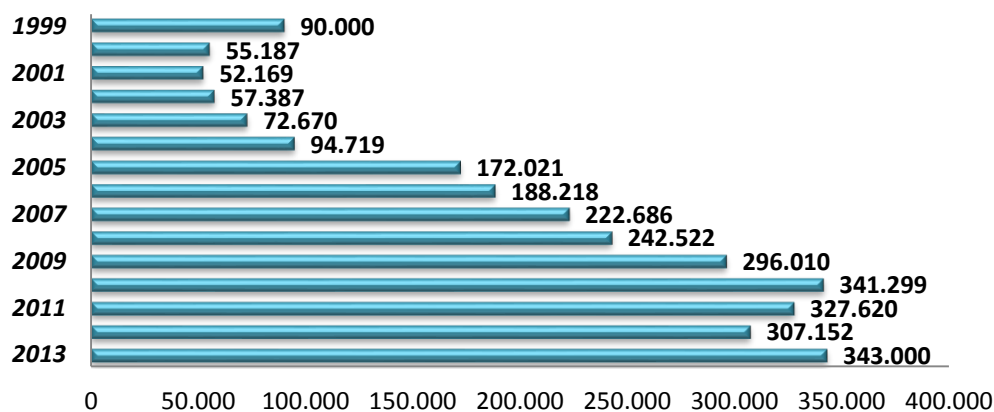
A sign of the industry maturity is the flow of RDI activities outsourced by major investors to local subsidiaries in Romania [although car producers tend to keep upstream activities in the home country]. Following Renault's decision to outsource some of its RDI activities, especially by establishing an independently operated technology centre, several foreign suppliers (e.g. Continental,

Draexlmaier, INA Schaeffler etc.) have also established RDI and production activities in Romania in order to meet Original Equipment Manufacturer's (OEM) demand. At the same time, companies with indigenous capital (e.g. Topoloveni Auto Parts, Componente Auto Pitesti, Ronera Rubber Pitesti etc.) have developed their own products that have penetrated global value chains in the automotive industry.

For the production of Dacia range Renault has developed a complete chain of activities specific to the automotive industry, from manufacturing (Mioveni) and engineering (Renault Technologie Roumanie) to innovation, market research, product design (Renault Design Central Europe), testing (Titu Tehnical Centre), marketing and after-sales (Renault Commercial Roumanie). Based on this approach, Dacia has had a spectacular evolution over the last 15 years, moving from the status of local brand with a single product to an international brand delivering a full range of models. For both international press and industry analysts, the evolution of the Dacia brand represents a worthy of note case study that highlights the unprecedented dynamism of a car manufacturer. The company's success is reflected today in the range of 8 models sold under a "smart buy" strategy (Sandero, Sandero Stepway, Logan, Logan MCV, Dokker, Dokker VAN, Lodgy and Duster). The key lies in Dacia's decided to be out of the race for facilities and focus on the essentials (Pescaru, 2013).

The evolution of the range can be best emphasized by production, sales and price figures. As emphasized in *Figure 1*, the annual output of the Pitesti plant has increased from 55,187 units in 2000 to 72,670 units in 2003 (daciagroup.com). The annual output has reached 100,000 units shortly after the launch of the Dacia Logan in 2004 and the launch of 1.5l dci Logan in 2005 brought a new production volume record, almost twice higher than in 2004 (<http://romaniancar.com/dacia/>). The ascending trend was continued with a production of 343,000 vehicles in 2013 and of 314.719 units in the first 11 months of 2014.

Figure 1- Dacia passenger cars production (units)



Source: Ziarul Financiar, 2013

The increase in production volume was accompanied by a growth in sales of almost 43% in the first four months of 2014 relative to the similar period of previous year, making Dacia the most dynamic car brand in Europe (main export markets of the brand are France, Germany, Spain and Italy) (Dacia group). Dacia has reached a market share of 2.9% in the EU in the first 11 months of 2014 with nearly 372,000 units registered, up with 27% over the same period in 2013. Following the growth of 0.5% percentage points of market share, Dacia exceeded Kia (2.8%), Seat (2.5%) and Volvo (1.8%) helping the French automaker to reinforce its position as the third largest producer, with 1.21 million cars sold (a quarter were Dacia) (Zamfir, 2014). The best-selling model in the European market assembled in Romania in the first half of 2014 was Sandero, with 77,400 units, followed by another product from Pitesti, Dacia Duster (Alec, 2014).

The price evolution of the range proves a shift of strategy from the low cost segment to the “value for money” one. For instance, for the top version (Laureate 1.5 dCi 90 hp) of the new generation of Sandero is currently around 11.500 Euros, while the first version launched in 2008 reached a maximum of 9.350 Euros (Nan, 2008). Dacia entered the market with the Logan for only 6.000 Euros and it has reached the top price of 20.000 Euros for Duster in the European market (Barza, 2014). The features mix available on Dacia cars sold is in line with the smart buy strategy applied in Europe: “only technology for which there is a extremely high demand like the new navigation system and the reversing camera” (Dacia group). The use of differentiated strategies according to costumers’ willingness and interest to pay for additional features proves the maturity reached by the brand and seems to be the key for a sustainable evolution of the range on both European and developing markets.

2.1. The context for innovation

Interviews data indicate that there are structural, financial, and institutional factors that generate an unfavourable environment for innovation in the region, which we gather in Table 1.

Table 1 - Major obstacles to innovation

<i>Structural</i>	Difficult access to qualified personnel
	Poor technological infrastructure
	Limited demand of R&D from industries and other users
	Low international visibility of the R&D activity from Romania
	Lack of funds

<i>Financial</i>	The high cost of licensing and / or acquisition of new technologies
<i>Institutional</i>	Embryonic business support services Unpredictable R&D policies Low institutional performance and bureaucracy Regulatory factors

Source: Interviews' data

Among structural factors, the main concern expressed by entrepreneurs is related to the regional labour supply. A key obstacle for innovation was identified with the lack of suitably qualified personnel, both scientific and managerial. It is hard to find specialists and this is mainly an effect of one of three situations: the educational system does not provide graduates with the needed skills in the production and research field; top students that could bring value added decide to emigrate or are “hunted” by foreign companies and, last but not least, young specialists choose better paid public positions.

The financial drawbacks refer to both national and European funds intended for innovation. In absolute terms, Romania's per capita spending on research and development are nearly 20 times less than the European average. On the other hand, the demand for RD is low, is not stimulated enough nor sufficiently stimulates other economic sectors. Although multinationals play a catalyst role for knowledge-based start-ups and technology clusters, large foreign companies stress the fact that despite their interest to invest in RDI activities, funding possibilities are scarce and small and medium enterprises are somehow privileged in accessing European funds. On the other hand, companies that have applied for European funds have been discouraged by bureaucracy and by delayed payments and are now quite prone to doubt about future collaboration with the public sector.

Business support services in the region are still at an incipient phase and there is a lack of communication channels through which innovation is transferred or assets involved in the regional innovation processes are connected.

Romania should solve several fiscal and legislative issues in order to attract large companies in the industry to develop RDI capacities here. Romania is perceived as having a hostile intellectual property environment on the grounds of some past episodes involving Dacia employees that have claimed and gained through the legal system the “paternity” of several innovative improvements. One of them is the Intellectual Property Rights law that is on hold, and the other one is the legislation concerning counterfeit products and visible parts of the car should tighten up as to lower the massive 33 percents of counterfeit Dacia car parts available on the market (ACAROM).

The fiscal system implemented in Romania is perceived as ambiguous and unpredictable by foreign companies that complain about the permanent uncertainty concerning the number and types of taxes that must be paid. At the same time, the fact that the tax deduction for RD investments is conditional on a share of 15% RD investment in total turnover and is related to the company profits, makes the instrument of little applicability.

When it comes to *factors driving innovation*, entrepreneurs state that competition represents the main engine that pushes companies to innovate and keep up with the latest trends, the presence of foreign competitors in the region proving a positive impact on domestic companies' preoccupation for innovative activities. A second factor highly related to competition is the OEMs strategy towards innovative solutions. The final producer is the one setting trends and in the struggle to offer the best solutions, companies seek for better materials, production methods or the latest technological equipments. Most of the automotive companies in the region have Renault as main customer and this can be seen as both a stimulating and a hindering factor: having an OEM in the region is a good stimulant for companies to invest in innovation, but it can also slow them down since there is the certainty of the demand for their products. Dacia range is known as a low-cost class of automobiles and perhaps at first sight innovation in the case of low-cost vehicles may seem somehow bizarre. Actually, it seems that this is quite the opposite: whereas in the case of premium class vehicles clients are willing to pay for the latest functionalities and improvements and spending money on innovation is not a problem, the real challenge in the low-cost segment is how to innovate and keep it cheap. The idea is also shared by the sector experts that stress the importance of employing local workforce in the upstream activities in the case of low-cost cars. Thus, a delocalization of RDI capacities is a key factor in the success of low-cost cars.

Among factors stimulating innovation were also mentioned the attendance to international fairs and conferences, the practice of disseminating "Best Ideas" to other factories in the group, continuous training, entrepreneurs' attitude and experience in the field. To our surprise, all of the mentioned factors are external ones, i.e. industry and market-driven reasons. None of the entrepreneurs mentioned intrinsically/inner reasons that would motivate them to design and develop new products or technologies. Still, entrepreneurship is somehow equivalent with the impulse to create and innovate, with a desire to implement innovation and with motivating others to participate actively in its implementation.

In line with the general approach in the industry, the type of innovation mainly developed by companies in the region regards *process innovation*. The acquisition of new equipments and machines

is often perceived as innovation and maintaining a top level of used technologies represents a key factor in preserving market competitiveness.

2.3. Innovation culture and its relevance to business success

The section depicts entrepreneurs' attitude and perception towards innovation, ways of promoting innovation culture in the company, and the capacity for innovation at firm level.

Opinions on the innovation issue were convergent towards emphasising the imperative need for innovative activities at the current stage of the region and of the industry. The general message is that innovation represents a mandatory investment and that companies that do not keep up with the major trends are out of the market in no time. Furthermore, entrepreneurs estimate that in less than four years there will be no company on the market without a clear RDI strategy, innovating either on its own or in partnerships. In other words, stakeholders in the industry are very much aware of the role innovation has gained in driving competitive advantages.

The *most relevant entrepreneurship skills* required for creating and running innovative projects in existing or in start-up firms in entrepreneurs' vision are risk assessment, self-confidence, and the capacity to motivate others to achieve a common goal. Several other qualities needed for an innovative entrepreneur are strategic thinking, the ability to make the best of personal networks and the capacity to deal with challenges and insecurity. The founder's attitude and experience in the assembling process also has a great influence in gaining technical advantages. For example, managers that have modified out of date equipment have significantly improve its performance by adding extra functions and thus transforming it into a unique resource for the company.

In the analysed companies innovation is perceived mostly as a collective effort rather than an attribute of the entrepreneur. The entrepreneur is perceived as an *initiator/ promoter*, in charge with finding the suitable way to key up the personnel. The manner of stimulating employees to be creative and innovative is quite similar among companies in the region: financial incentives are the most commonly used in the attempt to promote innovation culture among employees, followed by hierarchical accession possibilities, and the Kaizen methodology. A key factor in motivating workers seems to be the personal example of the entrepreneur and group's appreciation.

Entrepreneurs' perception on the cost/benefits ratio is decisive in the decision making process of investing in innovation. This is why they were asked to make a cost/benefits analysis of investing in innovation at the current stage of development of their organization and of the automotive market in Romania in general. Results show that despite the fact that costs are considered high and a positive

impact is expected on the long run, benefits weigh more for the entrepreneurs. They are aware of the economic benefits innovation provides to a company and point mainly to: cost reduction and efficiency improvement leading to an increase of competitiveness, gaining customers and suppliers' confidence, hence a portfolio diversification of both clients and markets.

The innovation concept seems to be familiar among entrepreneurs and regional structures representatives, but a clear picture of how innovation is really approached can be obtained by looking at the *resources organizations assign for RDI activities*. The critical question is to what extent firms are internally active in RD and innovative activities and a relevant indicator can be the percentage of the turnover/ total sales dedicated to RDI spending. Companies in the region are characterized by non-systematic patterns of engagement, have no clear strategy or budget concerning RDI spending [only two of the interviewed managers were able to mention a percentage of the turnover assigned to innovation (around 3%)]. The absence of committed resources speaks for itself about the maturity of Romanian companies in approaching innovation. On the other hand, industry stakeholders deem that human resources are the governing resource in RDI processes and technical qualifications are the ones that make the difference in the automotive industry. From their point of view, the know-how is the most durable investment that can lead to sustainable and continuous growth.

2.4. Interactions, networking, and the local productive environment

This section analyses relationships developed between firms in the automotive industry in Muntenia region and with the research and support base of the region.

Typically, to carry out RDI activities represents a strategic and long-term process; it takes time to undertake tests and to deliver production-ready products or technologies. In the case of the automotive industry, RDI activities rely on significant investment efforts and, more and more, on partnerships with stakeholders.

The analysis of entrepreneurial behaviour shows that in general the cooperation spirit among the firms in region is low. The majority of the sampled companies reported no type of cooperation with direct competitors or with up-stream and down-stream partners. Explaining this attitude, answers go from a certain mentality managers have towards cooperation to a lack of interest and vision on the benefits arising out of a partnership of this kind. The collaboration with other firms happens especially in the light of the affiliation to a number of professional organizations such as ACAROM, UGIR 1903 and the local Chambers of Industry.

There have been several attempts to gather industry representatives in common projects or at regional debates and most of them have had no success due to the resistance when it comes to cooperation. Nevertheless, companies willing to cooperate manifest a higher interest for common projects with local companies rather than with distant partners. They also tend to engage in cooperation with competitors rather than upstream or downstream related firms.

However, there are several examples of good practice implemented in the region at Renault Technologie Roumanie' initiative. A competitiveness pole was created in February 2014 that includes regional companies, universities, and public authorities with the aim of strengthening cooperation on RDI activities between involved actors. Overall, entrepreneurs manifest a positive and optimistic perspective regarding the effects on companies' activity as a result of this project and consider that cooperation at the regional level will generate external economies of scale and thus an increase in efficiency. Another attempt to intensify cooperation was Renault's initiative to develop the Alliance Suppliers Improvement Program (ASIP), "an intensive Logan supplier training plan program through which Renault sends some of its employees to supplier companies to assist in optimizing procurement and quality assurance and to transfer the necessary key technologies" (Schmid and Grosche 2008, p.84).

Ccooperation with the science base of the region, regional and local administration, and with business support organizations does not seem to be on the priority agenda for most of the firms. At the same time, business support services in the region are still at an incipient phase and there is a lack of instruments that may create communication channels between assets involved in the regional innovation processes and facilitate the transfer of academic researchers' ideas into new products or services.

As for joint research contracts with the academia, these are not frequent either. When concluded, they have a specific purpose and do not become permanent. Several reasons explain this situation: lack of modern laboratories in universities and research institutes, outdated research curricula, timing differences between the short cycle planning firms have and the longer timescales of academic research. Business representatives stress that it takes too much time for universities to deliver a research offer, it involves lots of people, results are provided in too long time and are sometimes out of date compared to the needs companies have. At the same time, academia points to the low demand for RDI projects coming from the business sector and to some slight differences in the way the two parts manage intellectual property rights. All these factors lead to meagre demand for public research and to a low rate of collaboration between research organizations and firms.

2.5. Perspectives on innovation

Interviewees were asked to offer suggestions for an effective improvement of the regional innovation framework from a list of available measures and to mention perspectives regarding RDI activities. The most widely held suggestions, mentioned by the majority of the interviewees, are related to a higher consistency in RDI policies along with a greater emphasis placed on industrial research. Overcoming financial drawbacks demands for an ease of access to European funds and a higher budgetary allocation for RDI, accompanied by subsidies for innovative activities, and provision of tax incentives for RDI activities and clusters development. An increased attention should also be paid to the endowment of universities and research institutes' laboratories and to supporting researchers to attend international conferences and fairs on RDI in the automobile industry. Other recommendations with significant support from the stakeholders include the provision of useful information, best practices transfer from abroad and better local support mechanisms and institutions.

Table 2 - Main recommendations for innovation improvements

<i>Structural</i>	Adequate wage policy in the public research sector Increase R&D demand from the private and public sector
<i>Financial</i>	Introduction and use of new financial and non financial instruments Stimulation of participation in international RDI fairs Endowment of universities and research institutes' laboratories
<i>Institutional</i>	Regulation and standardization of RDI policies Better local support mechanisms and institutions

Source: Interviews' data

The general state of mind concerning future RDI activities is positive and optimistic from both company and regional perspective. The RDI component is intended to be developed especially by accessing more structural funds and by expanding product and customer portfolio.

Nicolas Maure, Dacia Director, foresees new projects for Renault, Nissan, Daimler or Avtovaz to be developed in Pitesti especially since improvements of the overall quality of the production process have been made and the qualities of Romanian employees have increased significantly. Currently in the regional industrial base an integrated project can be completed: starting with the draw and design of new cars style, to testing and validating them. It's a unique situation in Eastern Europe that creates opportunities for the development of the low price cars competing on global markets, not just in Europe. It is up to Romania to continue to build on its attributes.

Conclusions

The Romanian automotive sector proved an adequate research platform to weigh the prerequisites of innovation against the need to transform its virtues in entrepreneurial success due to a mix of strengths and vulnerabilities specific to a relatively mature market. The findings of this paper suggest that there is a series of three factors underlying the innovative performance at regional and industry level and affect the pace and direction of entrepreneurial creativity.

The first one is the presence of an *innovation friendly business environment*. Unfortunately, most of the potential sources nurturing further innovative processes remain idle or at least insufficiently taken advantage of in order to overcome an ‘autarchic’ entrepreneurial culture. Targeted policies, adequate investment incentives, or public campaigns are needed to turn bright ideas into drivers of competitive advantages. Priorities should include improvement of regional business support services, consolidation of communication networks, increased openness towards new ideas and cooperation with entities within and outside the region.

Second, *entrepreneurs’ personality* is a key factor in stimulating innovation. The personal example of the entrepreneur, his attitude towards new ideas and experience in the field play a crucial role in developing innovative solutions. In other words, entrepreneurs themselves are among the drivers of innovation and their attitude towards innovation is crucial, a finding that brings us back to the conundrum of the decisive determinant between innovation and entrepreneurship.

Third, the market research revealed that the *external competitive environment* translated into demand for innovative products, latest industrial trends, shortening of production and lifecycle of products, environmental and legal issues, and fierce global competition are key forces driving entrepreneurship at the regional and industry level. All this pressure determines a preoccupation for an innovation adequate environment and for a higher openness towards cooperation.

Maintaining competitiveness relies mainly on two factors: wage level and industrial performance. On the wage side, Pitesti (Romania) has registered a wage rise of 170% from 2007 to 2013 at an inflation of 30%, meaning that real wages have increased by 140% (Schmid, and Grosche 2008, p.90) [30.2 % in 2007, 33% in 2008] and is currently under tough negotiations on a new wage increment of around 15%. In other words, in relative terms Romania is no longer a low cost location for Dacia and must face strong competitiveness competition from Morocco and Turkey plants. The danger of relocation will increase if the shortcomings in the innovation capacity that restrain future value chain development will not be improved. Pitesti is the group’s second largest platform (after

the Lada-AvtoVAZ) and to remain so it must be at the highest level of quality, production timing and rely on technical and management professionals that can successfully contribute in products renewal. The evolution of the global industry within the next 15-20 years (electric cars, hybrid and autonomous cars) demands for a strong commitment to quality, innovation and cost management.

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References

- ADR Centru, Study: *Industria auto, un domeniu economic cu o dezvoltare rapida in Regiunea Centru*, available at: http://www.adrcentru.ro/Document_Files/Analiza%20industria%20auto_6pwhfh.pdf, (accessed 22 January 2015).
- Alecu, B. (2013), Ziarul Financiar, “*Unde suntem cu industria auto dupa 15 ani*”, Ziarul Financiar, 19 Nov, available at: <http://www.zf.ro/zf-15-ani/unde-suntem-cu-industria-auto-dupa-15-ani-11706206> (accessed 9 November 2014).
- Alecu, B. (2014) “Topul marcilor auto romanesti in functie de vanzarile de pe piata europeana. Sandero conduce clasamentul”, Ziarul Financiar, 9 August, available at <http://www.zf.ro/zf-24/topul-marcilor-auto-romanesti-in-functie-de-vanzarile-de-pe-piata-europeana-sandero-conduce-clasamentul-13043215> (accessed on 8 nov 2014)
- Barza, V. (2014) „Interciu Nicolas Maure, director general Dacia: Avem probleme de competitivitate nu doar cu Marocul, ci mai nou si cu Turcia. Unele proiecte ar putea fi alocate in viitor uzinei din Turcia si nu celei din Romania ”, *HotNews.ro*, 29 September, available at <http://economie.hotnews.ro/stiri-auto-18203524-interviu-nicolas-maure-director-general-dacia-avem-probleme-competitivitate-nu-doar-marocul-mai-nou-turcia-unele-proiecte-putea-alocate-viitor-uzinei-din-turcia-nu-celei-din-romania.htm> (accessed on 15 Feb 2015)
- Berger, R. (2008), *The Next Wave: Emerging Market Innovation, Threats and Opportunities How low-cost vehicles impact the automotive industry*, available at:

- http://www.rolandberger.de/media/pdf/Roland_Berger_The_next_wave_emerging_market_20100518.pdf, (accessed 22 January 2015).
- Brazeal D., and Herbert, T. (1999), *The Genesis of Entrepreneurship, Entrepreneurship: Theory & Practice*, Vol. 23, No. 3.
- Covin J.G., and Miles, M.P. (1999), “Corporate entrepreneurship and the pursuit of competitive advantage”, *Entrepreneurship Theory and Practice*, Vol. 23, No. 3.
- Dacia Group Report (2013), available at: <http://www.daciagroup.com/printpdf/4924>, (accessed 12 November 2014).
- Deakins D., and Freel, M. (2006), *Entrepreneurship and small firms*, (4th edition), McGraw-Hill Companies, London.
- Drucker, P., *Innovation and Entrepreneurship: Practice and Principles*, New York, Harper Business.
- Erawatch Country Report, 2012, available at: <http://erawatch.jrc.ec.europa.eu/erawatch/opencms/system/modules/com.everis.erawatch.template/pages/exportTypesToHtml.jsp?contentid=1884bd0c-7d1d-11df-b939-53862385bcfa&country=Romania&option=PDF>, (accessed 10 December 2014).
- Ernst & Young, The Central and Eastern European automotive market: Romania, available at: <http://www.ey.com/GL/en/Industries/Automotive/The-Central-and-Eastern-European-automotive-market---Country-profile--Romania>, (accessed 12 January 2015).
- European Commission, *Innovation Union Scoreboard*, 2014, available at http://ec.europa.eu/enterprise/policies/innovation/files/ius/ius-2014_en.pdf (accessed 12 January 2015).
- Fang, Z. (2005), “Exploring the synergy between entrepreneurship and innovation”, *International Journal of Entrepreneurial Behaviour & Research*, Vol.11, No. 1, pp. 25 – 41.
- Garcia R. and Calantone, R. (2002), “A critical look at technological innovation typology and innovativeness terminology: a literature review”, *Journal of Product Innovation Management*, Vol. 19, pp. 110–132.
- Govindarajan V. and Dubiel, A. T. (2010), “Reverse Innovation in Action: Romanian Cars from a French Company on the German Autobahn”, *Harvard Business Review*, May 21
- Haddock R., and Jullens, J. (2009), “The Best Years of the Auto Industry Are Still to Come”, *Strategy and business*, issue 55.
- Juliussen E. and Robinson, R. (2010), *Is Europe in the Driver's Seat? The Competitiveness of the European Automotive Embedded Systems Industry*.

- Kirzner, I. (1997): Entrepreneurial Discovery and the Competitive Market Process, An Austrian Approach, in: *Journal of Economic Literature*, Vol. 35, No. 1, pp. 60-85.
- Knight, F. (1921), *Risk, Uncertainty and Profit*, Chicago, Chicago University Press.
- Kohtamäki M., Kekäle, T. and Viitala, R. (2004), "Trust and Innovation: from Spin-off Idea to Stock Exchange", *Creativity and Innovation Management*, Vol. 13, No.2, pp. 75-88.
- McFadzean E., O'Loughlin A. and Shaw, E. (2005) "Corporate entrepreneurship and innovation part 1: the missing link", *European Journal of Innovation Management*, Vol.8, No. 3, pp. 350-372
- Mets, T. (2005), "Innovation models and success factors of knowledge-based business" *Knowledge-Based Economy: Management of Creation & Development*, pp. 263–273.
- Mosquet X., Russo, M., Wagner, K., Zablit, H. and. Arora, A. (2014), *Accelerating Innovation: New Challenges for Automakers*, January 22
- Munteanu, C., Cojanu, V. and Neagu, F. (2012), *Noi directii de politica industrială si modificarile structurale necesare*. Bucuresti: Ed. Economica
- Nan, A. (2008), "Premiera Dacia Sandero - preturi si dotari", *ProMotor.ro*, 4 June, available at <http://www.promotor.ro/masini-noi/news/dacia-sandero-preturi-si-dotari-2685175> (accessed on 18 Jan 2015)
- OECD, European Commission, *Oslo Manual. Guidelines for collecting and interpreting innovation data*, 3rd Edition, 2005
- OECD, *SMEs, Entrepreneurship and Innovation*, 20 May 2010
- Peña García-Franco R., *El sector de componentes de automoción en Rumania*, Oficina Económica y Comercial, , Embajada de España en Bucarest, 2012
- Pescaru, C. (2013) "Directorul general Dacia si Renault Romania despre avantajul tarii noastre, piata auto si planurile de viitor – Interviu", *Ziare.com*, 30 October, available at <http://www.ziare.com/dacia/vanzari/directorul-general-dacia-si-renault-romania-despre-avantajul-tarii-noastre-piata-auto-si-planurile-de-viitor-interviu-1265193> (accessed on 21st of February 2015)
- Radosevic S. and Rozic, A. (2005), *Foreign direct investment and restructuring in the automotive industry in Central and East Europe*, University College London, School of Slavonic & East European Studies, Working paper 53.
- Schmid S. and Grosche, P. (2008), *Managing the International Value Chain in the Automotive Industry. Strategy, Structure, and Culture*, 2008
- Schumpeter, J.A. (1934&1961), *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, , Harvard University Press, Cambridge.

Smith, D. (2006), *Exploring Innovation*, McGraw-Hill, New York.

Stake R. E. (2010), *Qualitative research: Studying how things work*, The Guilford Press, New York.

Wagner K., Foo, E., Zablit, H. and Taylor, A. (2013), The Most Innovative Companies. Lessons from Leaders, Boston Consultin Group, September 26, available at: https://www.bcgperspectives.com/content/articles/innovation_growth_most_innovative_companies_2013_lessons_from_leaders/, (accessed 10 December 2014)

Wyman, O. (2007), *Car Innovation 2015*.

Zamfir, C. (2014) „Dacia a depasit Seat, Kia si Volvo la cota de piata in UE”, *Businesscover.ro*, 16 Dec, available at <http://www.businesscover.ro/dacia-depasit-seat-kia-si-volvo-la-cota-de-piata-ue/> (accessed on 12 Jan 2015)