

PROFILING MACEDONIA'S INNOVATION PERFORMANCE

Prepared by:

Andrijana Bogdanovska, Knowledge Center

Wolfgang Schabereiter, Brain +

Julija P. Stojkovska, Knowledge Center

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PREAMBLE

This publication presents results from the Innovation Survey of firms operating in Macedonia, carried out by Knowledge Center from Macedonia and brainplus from Austria. The survey covers innovation activities within Macedonian companies in the period 2010-2013.

The survey is carried out in the frame of the project AIM@Innovations (www.i-lab.mk), which is co-financed by the Austrian Development Cooperation through an agreement between the CEI and the Austrian Development Agency (ADA) under the programm KEP AUSTRIA.

KEP AUSTRIA represents a specific component of the KEP, which are in general an instrument to provide capacity building, technical assistance and know-how transfer from EU-CEI countries to non-EU CEI countries. The Austrian Government has supported it since 2008 with resources made available by the Austrian Development Cooperation (ADC), based on a Grant Agreement between the CEI and the Austrian Development Agency (ADA). KEP AUSTRIA is managed by and based in the CEI Executive Secretariat in Trieste (Italy), which provides administrative and conceptual support to the CEI structures. KEP AUSTRIA offers grants to projects where know-how providers from EU-CEI Member States transfer specific experience, best practices and knowledge to know-how recipients from non-EU CEI Member States.

The Central European Initiative (CEI) is a regional forum for intergovernmental cooperation in Central-, Eastern- and South-Eastern Europe. It was established in 1989 and is currently composed of 18 Member States: Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Hungary, Italy, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine. The CEI aims to promote a cohesive and united Europe and in particular to assist its non-EU Member States in order to strengthen their capacities by promoting their socio-economic structures.

EXECUTIVE SUMMARY

The study on profiling Macedonian's Innovation Performance is a part of the project AIM@innovations, which is supported by the Austrian Development Cooperation, through the CEI, KEP Austria Call 2014. The main aim of the project is to enable transfer of knowledge and strengthen the national capacities for provision of thematic trainings and consultancies in the area of Innovation Management to SMEs, start-ups and spinoffs in Republic of Macedonia. Therefore, the study's goal is to enable an understanding of the context in the country for identifying the areas which require immediate attention, so the same could be covered through the services of the newly established Innovations Lab in the future.

It is a country case study, and as a research strategy its reliability and validity depend on the use of triangulation of data collection methods and data sources. We applied a multi-method approach for data collection made out of: (1) secondary research of data from reliable sources, and (2) a survey of Macedonian companies.

The secondary research covers a collection of data from published reliable sources, as are National Strategies, along with publications from the State Statistical Office, International Organisations, as the World Economic Forum, the World Bank and the IMF, along with Laws and Regulation of Republic of Macedonia. The survey, as a data collection method includes the opinion of a large group of SMEs.

The results from the study Profiling Macedonia's innovation performance, portray a country with significant ambition to change the structure of its economy (assessed as efficiency-driven) towards the higher value added industries and increase the in-country capacities for innovation (policies, strategies and active programs and measures).

Findings emphasise that 78% of the surveyed Macedonian companies in the period 2010-2013 were involved in some type of an innovation activity (product/service innovation, process innovation or organisational/marketing innovation), invested in innovations which are not yet complete, or innovation projects which have been abandoned, and/or had innovation-related expenditures. The main obstacle to introducing innovations comes from the fact that companies have difficulties with the commercialisation of their ideas. They are not aware of their innovation capacities, and how to commercialise their existing resources, platforms and knowledge. Another significant challenge arises from the lack of finances, or more probably the lack of information for the financial sources available to companies in Macedonia. More than half of the surveyed companies abandoned their innovation projects, mainly because of the uncertainty of the markets, the strong competition, the lack of suitable partners, and the lack of finances. Our research identifies and explores a multitude of relevant source of finances for companies in the country and the EU; thus, availability of finances should not be a significant challenge, especially for the established SMEs.

In general, and despite the fact that more than half of the surveyed companies tend to use closed innovation models, one may argue that there is a balance in the open and closed innovations

approach, where the dominant information source is a combination of internal and market sources (clients, suppliers and competitors – direct spillovers). Unfortunately, the cooperation with Universities and Research centres is assessed as low. In general the findings on the infrastructures of support for innovation in the country –infer challenges with the efficiency of the research centres in ownership of the government and the public sector, as the expenditure of both are lower compared to the revenues.

Despite numbers and initiatives, clusters have still not reached the required efficiency for improving the sophistication of the business processes, while numbers on the activity of FDIs in the country indicate a low spillover effect to the local companies and absence of a more serious technology transfer; nonetheless, having in mind the current stage of entry for majority of the MNEs, we can expect the spillover to intensify in the future.

TABLE OF CONTENTS

Chapter 1	Introduction	7
1.1	Importance of Innovation	7
1.2	Innovation and Competitiveness in Republic of Macedonia.....	7
1.3	Innovation Strategy of the Republic of Macedonia 2012-2020	9
Chapter 2	Innovation amongst Macedonian Enterprises	10
2.1	Research Aim and Objectives.....	10
2.2	Methodology.....	10
2.3	Profile of the Macedonian Enterprises	11
2.4	Overview of Innovation activities of Macedonian enterprises	12
2.4.1	Product/Service Innovation	13
2.4.2	Process Innovation	16
2.4.3	Organisational and marketing innovations.....	17
2.5	Sources of information and co-operation for innovation activities	18
2.6	Innovation activities and expenditures	20
2.7	Effects of Innovation	22
2.8	Factors hampering innovation activities.....	23
2.9	Intellectual property rights.....	24
2.10	Summary on the Survey of Innovation Activity.....	25
Chapter 3	Innovation landscape in Macedonia	26
3.1	Scientific Research – Areas and Expenditure.....	26
3.2	Cluster organizations in Macedonia	27
3.3	Foreign Direct Investments and Knowledge Transfer.....	30
Chapter 4	Funding of Innovation in Macedonia	33
4.1	National Funding Opportunities	33
4.2	Other Funding Opportunities.....	34
4.2.1	Macedonian Bank for Development Promotion.....	34
4.2.2	European Bank for Reconstruction and Development – EBRD in Macedonia .	34
4.2.3	Macedonian Business Angels Network.....	35
4.2.4	Commercial Banks	35
4.3	EU Funding Opportunities.....	36
Chapter 5	Conclusion.....	38
References and Bibliography		39
Appendix –Profile of Surveyed Companies		41

TABLE OF FIGURES

Figure 2-1. Geographic Coverage	11
Figure 2-2 Revenue Intensity (2010-2013)	11
Figure 2-3 Number of Employees (2010-2013).....	12
Figure 2-4 Product Innovation Activities (2010-2013).....	13
Figure 2-5. Company Size vs. Innovation Activity.....	13
Figure 2-6. Who Developed these product/service innovations?.....	14
Figure 2-7. Open vs. Closed Innovation Models	15
Figure 2-8Figure 2 8. Novelty of the Introduced Products/Services.....	15
Figure 2-9. The structure of the revenues (2010-2013).....	15
Figure 2-10. Process Innovations (2010-2013).	16
Figure 2-11. Company size vs. Process Innovation	16
Figure 2-12. Who developed these process innovations?	17
Figure 2-13. Type of Organisational/Marketing Innovation Introduced.....	17
Figure 2-14. Importance of the Impact of the Organisational Innovations	18
Figure 2-15. Innovation Information Sources (2010-2013).....	19
Figure 2-16. Cooperation with other Enterprises or Institutions.....	20
Figure 2-17. Type of Innovation Activities (2010-2013).....	20
Figure 2-18 Amount of Expenditure used for Innovation Activities	21
Figure 2-19. Public or other funding for Innovation Activities.	21
Figure 2-20. Impact of the Innovation Activities.	22
Figure 2-21. Abandoned Innovation Activities.....	23
Figure 2-22. Delay of the Innovation Activities.....	23
Figure 2-23. Factors which constraint Innovation Activities (2010-2013).....	24
Figure 2-24. Intellectual Property Protection (2010-2013).....	24
Figure 3-1. Scientific-Research Institutions – Breakdown.	26
Figure 3-2. Revenues and Expenditures of the R&D Institutions in 2013.....	27
Figure 3-3. FDI in the Balkan Region 2009-2013	31
Figure 4-1. EU Sources of Funding for SMEs	37
Figure A-1Changes of the revenue in the period 2010-2013	41
Figure A-2Total number of employees in 2013	41
Figure A-3Distribution of respondents	42

Chapter 1 Introduction

1.1 Importance of Innovation

From the first appurtenance of innovation in the economic theory of nations i.e. Schumpeter (1930s) till today, the definition of innovation has changed many times in order for the same to accurately reflect the growth in social understanding of the concept. As a result, innovation today is no longer just a novel product, or a technology developed in the R&D labs of companies, it as well is a broad range of activities which purpose is to develop new or significantly improved products, new processes, new marketing approaches, or new organisations of business practices.

The contemporary understanding on the term *Innovation* originates from the writings of Urabe et al., (1988, p.134), who based on an international comparison of innovation and management practices of companies, articulated its meaning “the generation of a new idea and its implementation into a new product, process, procedure, or service, leading to the dynamic growth of the national economy and the increase of employment, as well as to the creation of pure profit for the innovation business enterprise”. As innovation is an important driver of profitability, while the capability to be innovative on a continuing base is the most important factor for competitiveness of organisations and economies, innovation generates value, and as such it affects the economic growth of nations. Therefore, it is an important element of national policies of many nations, Republic of Macedonia included.

1.2 Innovation and Competitiveness in Republic of Macedonia

Republic of Macedonia is located in the South-eastern Europe, and has a population of more than 2 million. According to the latest information provided from the National State Statistical Office (2015) ending with 2014, there were 70 659 active business entities in the country, majority of which i.e. 95% are Small and Medium Enterprises (SMEs). The growth of the GDP rate in the final quarter of 2014 is 2.7%, while the unemployment rate for 2014 is 27.6% (State Statistical Office of RM 2015). In the shadows on the economic recovery of Europe, Macedonia has good economic growth; however, its high unemployment rate stubbornly persists despite the many measures to decline it.

According to the Global Competitiveness Report for 2014 (WEF 2015), which assesses the competitiveness landscape of 144 economies and provides insight into the drivers of their productivity and prosperity, **Republic of Macedonia is described as an efficiency driven economy** ranked at the 63rd position. In the pillar of innovation and sophistication factors, the country is at the 73rd position, with business sophistication being assessed at the 89th, and innovation at 68th. These numbers provide a base for developing a good understanding on the innovativeness of the Macedonian economy and companies relative to the others.

Business sophistication concerns two elements that are intricately linked: the quality of a country’s overall business networks and the quality of individual firms’ operations and

strategies. Sophisticated business processes are conducive to higher efficiency in the production of goods and services. The quality of country's business networks and supporting industries, as measured by the quantity and quality of local suppliers, and the extent of their interaction, is important for a variety of reasons.

First, when companies and suppliers from a particular sector are interconnected in geographically proximate groups, called clusters, efficiency is heightened, greater opportunities for innovation in processes and products are created, and barriers to entry for new firms are reduced. Individual firms' advanced operations and strategies (branding, marketing, distribution, advanced production processes, and the production of unique and sophisticated products) spill over into the economy and lead to sophisticated and modern business processes across the country's business sectors (GCR WEF 2014).

The fact that Macedonia ranks 89th in the Business sophistication out of 144 economies, implies that the country is still dependent on the basic sources of productivity improvements. Therefore, improving business sophistication is important, because as the definition of Innovation implies, Innovation can emerge from both, new technological and non-technological knowledge. Non-technological innovations are closely related to the know-how, skills, and working conditions embedded in organizations, and are therefore largely covered with the state of the business sophistication processes. If the sophistication of these processes is low, the emergence of Innovations from non-technological knowledge will lag behind.

Compared to non-technological innovations, technological innovation is the more important factor which can contribute for improving the standard of living on the long run. Technological breakthroughs have been at the basis of many of the productivity gains that our economies have historically experienced. Technological innovations are not only transforming the way things are being done, but also opening a wider range of new possibilities in terms of products and services. In this regard technological improvements are particularly important for developing economies as Macedonia, as they can improve their productivity through technology transfer, or make incremental improvements in other areas. This can be seen in the higher rankings of Macedonia in the areas of investment in new technologies by the public and private sector i.e. 68th position; however, the country lags behind the others when it comes to the capacity of companies to innovate along with the number of patents per population of a million, i.e. ranked at the 91st position by the GCR (WEF 2015).

From the analysis presented in the preceding paragraph it can be inferred that Macedonian economy is more agile when it comes to technological innovations than businesses sophistication; however, this conclusion predominantly reflects the public investments and initiatives in the new technology and infrastructure. Companies lag behind in technological innovation and technology transfer activities. Given the situation Macedonia understands that it cannot compete only on the base of low cost wages on the long run, and that it needs an entry into the higher value industries. As a result, the new National Innovations Strategy for 2012-2020 articulates a determination to grow and transform the country into a knowledge-based

economy able to compete at international markets through its skilled labour and innovative companies.

1.3 Innovation Strategy of the Republic of Macedonia 2012-2020

At national, regional and global level, innovation and creation of new technologies are supported by developing adequate eco-systems made out of human capital, access to finance, intellectual property protection, and a favourable business climate. With an aim of developing the innovation capabilities on national level and bringing the competitiveness of the economy closer to the EU, Republic of Macedonia developed and adopted a National Strategy for Innovation 2012-2020, which covers all of the above mentioned conditions and aims at creating a favourable national innovation eco-system.

According to the Global Competitiveness Report (WEF 2014), and the National Strategy for Innovation 2012-2020, the main limitations when it comes to developing the innovation capacity in Macedonia, come from the poor access to finance, followed by the lack of absorptive capacities for new technologies in SMEs. These weaknesses in the national financial sector have hindered the development of companies' capacities to invest and potentially innovate. To compensate for the lack of adequate funding, the Macedonian government launched a Fund for Innovation and Technology Development in November, 2013. The Fund is a part of the National Innovation Strategy and aims at supporting innovation and R&D activities in small and medium-sized enterprises. It is financed by a loan from the World Bank in a value of €8 million, an amount which is going to be spent over the next three years 2015- 2017. The Fund will finance activities and innovation projects in ICT, agriculture, tourism, and renewable energy, preferably with a local collaboration agenda. Similar activities are envisioned for the university spinoffs in order to support the collaboration between the Universities and SMEs, and thus foster the collaboration in this area as well.

The success of this initiative along with the initiatives for making more financial resources available to Macedonian companies, depends on the absorptive capacity of Macedonian SMEs, start-ups, and spinoffs and their capabilities for managing innovations. Therefore, it becomes an imperative to explore this capacity through a research of the internal context of companies, and identify the capacities for managing innovations.

Chapter 2 Innovation amongst Macedonian Enterprises

2.1 Research Aim and Objectives

Given the context described in the preceding section, the main aim of the research is to assess the current level and capacity for innovations of Macedonian enterprises, with a particular focus on the Small and Medium Enterprises (SMEs). The research objectives are: (1) to explore the context of Innovations in Macedonian companies; (2) to assess the level of their activities in the Product vs. Process vs. Organisational innovations and (3) to identify the most important limitations for their ideas and development plans.

2.2 Methodology

This is a country case study, and as a research strategy its reliability and validity depends on the use of a triangulation of data collection methods (Yin 2003). As a result of the chosen research strategy, brainplus and Knowledge Center used a multi-method approach for data collection made out of: (1) secondary research of data from reliable sources, and (2) a survey of Macedonian companies.

The secondary research covers a collection of data from published reliable sources, which have been produced for different purposes, but which can be used for analysis within the current research. National Strategies, along with publications from the State Statistical Office, International Organisations, as the World Economic Forum, the World Bank and the IMF, along with Laws and Regulation of Republic of Macedonia, have been used in the analysis to provide an insight into the situation, continuity, and explanation of the findings.

The survey, as a data collection method enables width of the analysis, as it aims to include the opinion of a large group of entities, in this case SMEs. As a shortcoming it provides few opportunities for collecting data which could describe their motives. In order to overcome the shortcomings of the data collection method and enable depth when researching the status with the innovations in the Macedonian SMEs, a comprehensive instrument for data collection has been developed (questionnaire). The questionnaire was adapted from the widely used questionnaire of the Community Innovation Survey, which is a survey of innovation activity in enterprises carried out by Eurostat. CIS in its original form is used by the state Statistical Office of Macedonia, which findings as part of the secondary data have been as well considered in the analysis as an important source for data triangulation.

The survey was tabulated in Survey Monkey and distributed as an online questionnaire to a pool of more than 2000 companies. The researchers undertook specific measures for ensuring the email notification reached the managers of these companies, by linking the survey link with the email of the participant. 153 companies participated in the survey; however, only 90 respondents answered all questions of the survey. The response rate of the survey was in the range of 8%, which is an expected online response rate. Due to the use of cross-tabulation, only full responses were used in the analysis of the findings.

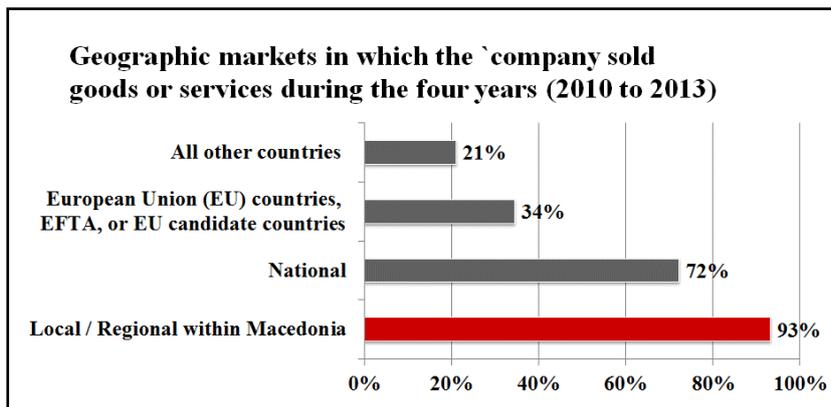
2.3 Profile of the Macedonian Enterprises

“Most Innovations fail. And companies that do not innovate die.”

Chesbrough (2006)

Demographic data collected from the respondents imply that the majority of respondents (companies), are Small and Medium Enterprises (SMEs), i.e. 86% of them have an annual revenue below 2 000 000 euros, and 84% have a number of employees below 250. More than half of the surveyed companies are headquartered in Skopje (54%), while the rest are located

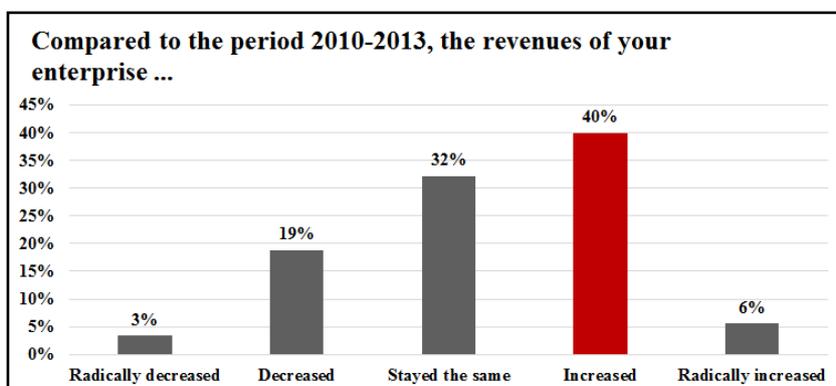
Figure 2-1. Geographic Coverage



in other parts of the country. Manufacturing, services and trade dominate the structure when it comes to the primary activities, with companies from the manufacturing area constituting 21%, services 29% and wholesale and retail trade 22% of the surveyed companies.

Around 10.8 % of the companies are part of an enterprise group, which is predominately headquartered in the Region, EU and USA (in order of appearance). The findings from the demographic data are provided in Appendix 1.

Figure 2-2 Revenue Intensity (2010-2013)

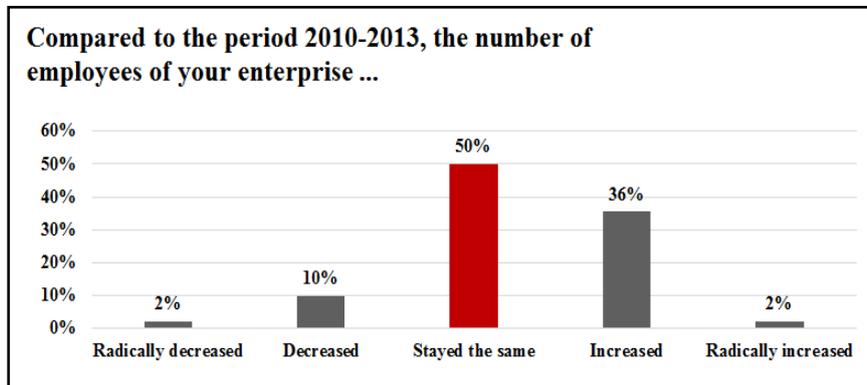


By looking closely at the activities of these companies in the period 2010-2013, one can conclude that Macedonian companies predominately targeted local/regional/national markets, with one third exporting to the EU, EFTA, or EU candidate

countries (34%), and one fifth (21%) exporting to other markets (Figure 2-1). These findings are supported by data coming from the Statistical Office of RM (2013) exploring the activities of Macedonian SMEs at different markets.

In the same period, almost half of the companies experienced increased, or radically increased revenues (46%) (Figure 2-2), which was followed by an increase in the number of employees in one third of the surveyed companies (38%) (Figure 2-3).

Figure 2-3 Number of Employees (2010-2013)



The findings from the demographic data and the activities of the surveyed companies in the period 2010-2013 (cross tabulation) emphasise that the Macedonian companies, which are predominantly SMEs, have experienced increased revenues and hired more workers in the area of manufacturing and services, while the manufacturing companies constituted 80% of the companies which targeted EU, EFTA, or EU candidate countries and other markets.

2.4 Overview of Innovation activities of Macedonian enterprises

In line with the adapted CIS questionnaire, the study explored a range of indicators for the innovation activities, outputs, inputs, and perceived constraints to innovation in Macedonian companies, in order to explore into more detail the innovation processes of the surveyed companies. A key construct, underpinning much of the proceeding analyses is the identification of ‘innovation active’ enterprises. There is considerable logic in setting aside the ‘in-active’ companies when exploring, for instance, perceived obstacles to innovation, or the level of innovation-related cooperation. This practice is followed here. In line with global standards of best practice promoted by CIS and Eurostat, enterprises can be defined as ‘innovation active’ if they satisfy at least one of the following criteria:

- They have introduced a new product, or significantly improved product (good or service), or a new or significantly improved process for producing and distributing products/services;
- They were involved in innovation projects, which are not yet complete, or innovation projects which have been abandoned;
- They have had innovation-related expenditures.

Having in mind these criteria and the survey findings, it can be concluded that 78% of the surveyed Macedonian companies in the period 2010-2013 were involved in some type of an innovation activity (product/service innovation, process innovation or

organisational/marketing innovation), invested in innovations which are not yet complete, or innovation projects which have been abandoned, and/or had innovation-related expenditures.

2.4.1 Product/Service Innovation

Product innovation is defined as the development of new products, changes in design of established products, or use of new materials or components in the manufacture of established products (Trott 2008) Numerous examples of product innovation include introducing new products, enhanced quality and improving its overall performance. Thus, product innovation can be divided into two categories of innovation: (1) radical innovation which aims at developing new products and usually is a result of the introduction of new technology at the market, and (2) incremental innovation which aim at improving existing products through small steps of improvement.

Findings indicate that in the period 2010-2013, more than two thirds of the surveyed Macedonian companies were innovation active when it comes to the introduction of either new products, services, or both (Figure 2-4). More than one third (35%) introduced new services; 13% introduced a new product, or an improved good, and 24% introduced both. Around 28% of the surveyed companies were not active in the product/service innovation area.

Figure 2-4 Product Innovation Activities (2010-2013)

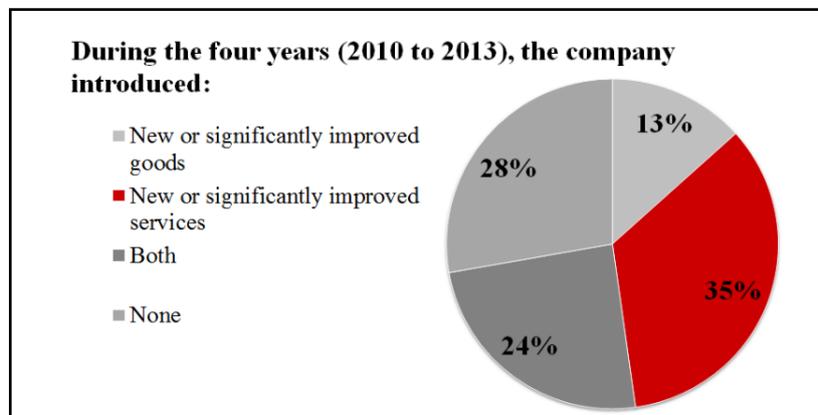
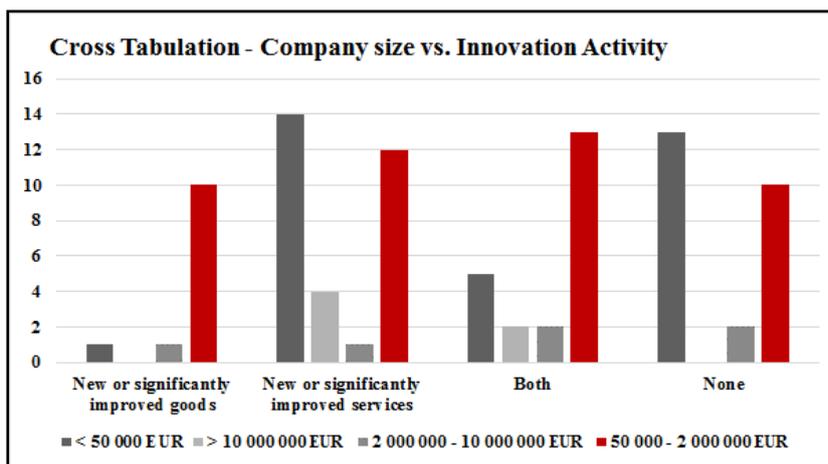


Figure 2-5. Company Size vs. Innovation Activity

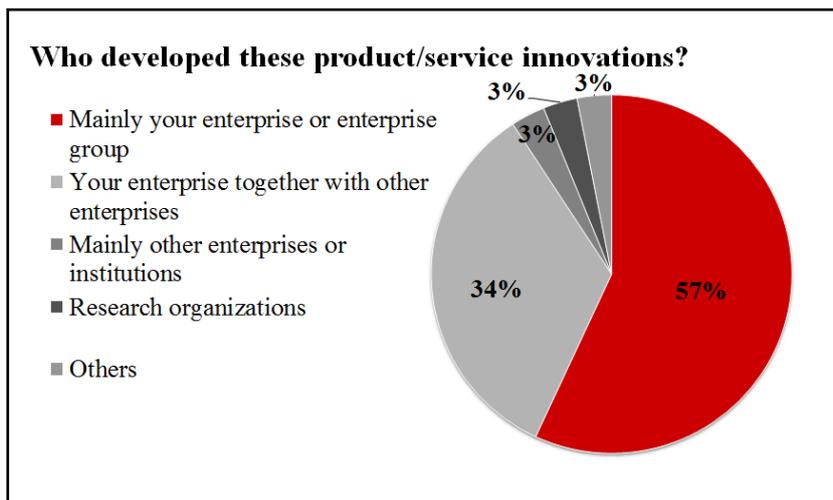


The cross tabulation reveals, that in terms of revenues, most innovation active companies for the period 2010-2013 were the ones, which had a revenue stream in the range of 50 000 and 2 000 000 euros (more than two thirds of these companies invested in innovation activities), while companies with annual turnover of less than

50 000 euros (micro) are least innovative, i.e. almost half of these companies do not invest in innovation activities – Figure 2-5.

More than half of the surveyed companies (57%) developed these product/service innovations internally and within their enterprise, or enterprise group. A third of the surveyed companies developed its innovations in cooperation with other enterprises (34%), while the innovation activities in cooperation with other enterprises and research institutes have been assessed as the lowest (9% in total) – Figure 2-6.

Figure 2-6. Who Developed these product/service innovations?

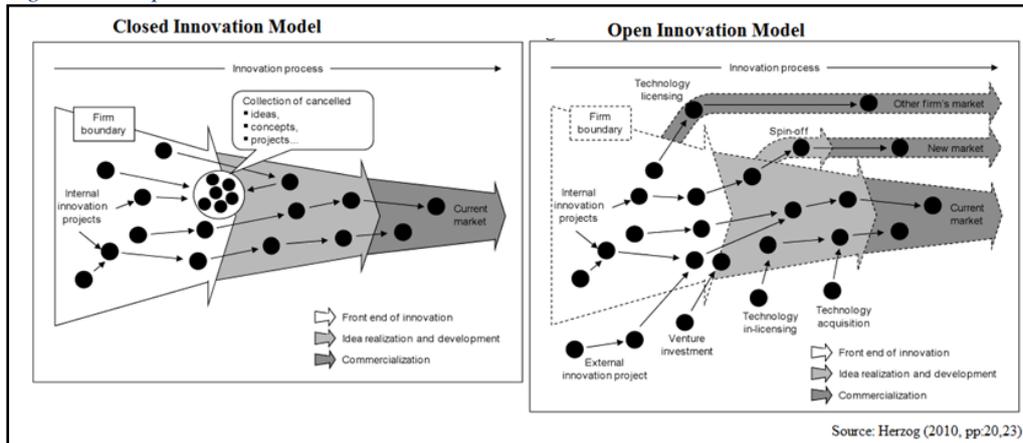


Therefore, one can conclude that **Macedonian companies tend to use closed innovation models** when it comes to product /service innovation. The underlying assumption behind the closed innovation processes argues that the “successful innovation requires control” (Herzberg 2010:20). It implies that the innovation projects can

enter the innovation process at the beginning, be developed using only internal resources and competencies, and exist by getting commercialised via company’s own distribution channels – Figure 2-7. (Herzberg 2010:20).

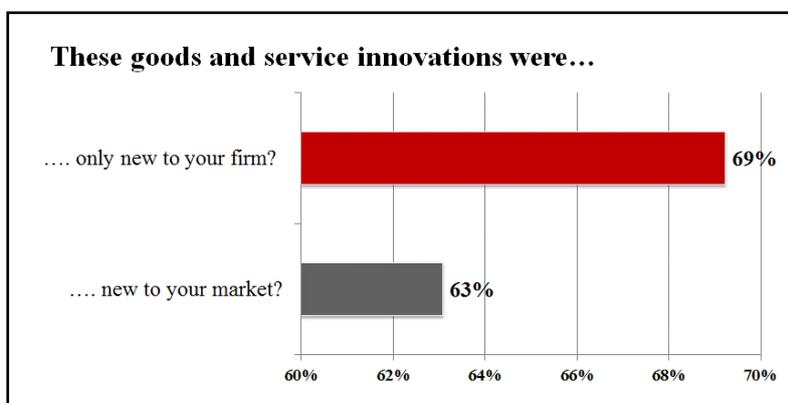
In this regard, however, one should not neglect the 43% of the surveyed companies, which reported that they engage in some type of a cooperation activity with other enterprises and institutions. Contrary to the closed, the open innovation models are practiced by companies which realise that valuable ideas do not need to come only within the company. Companies can and should use external ideas and technologies and external paths to market. In fact innovation initiatives should gain access and leverage into the insights, capabilities, and support of other companies without compromising legitimate corporate secrets (Wolpert 2002:7). From the findings it can be inferred that the approach to managing innovations among the Macedonian companies does not differ in large extent compared to the EU practices, where both models are equally practiced.

Figure 2-7. Open vs. Closed Innovation Models



In two thirds of the surveyed companies, these innovations were new to their company (69%) and the market (63%). It implies that in general the product and service innovations in the country are predominately new to the market (**Error! Reference source not found.**).

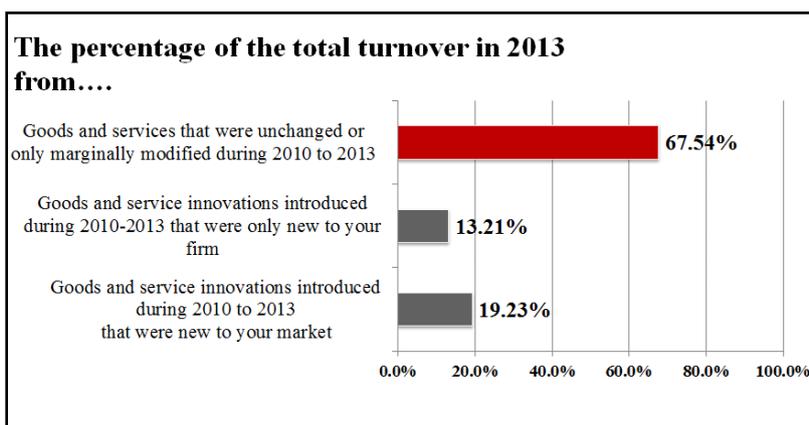
Figure 2-8 Figure 2 8. Novelty of the Introduced Products/Services



These product /service innovations however did not participate with a high percentage in the revenue structures of the surveyed companies in the concerned period (2010-2013). More than two thirds of the revenues of the surveyed companies (67.54 percent) came from goods and services that were unchanged, or only marginally modified

during 2010 and 2013 – **Error! Reference source not found.** Innovations that were new to the market generated 19 percent of the revenues, while the goods/services that were new to the company generated 13% of the revenues of the surveyed companies.

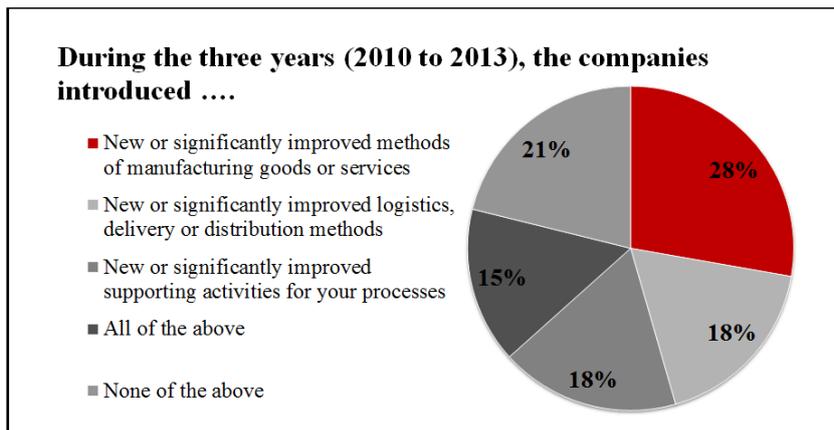
Figure 2-9. The structure of the revenues (2010-2013)



2.4.2 Process Innovation

Process Innovation describes measures in enterprises, which introduce a new or significantly improved production processes, distribution methods, or support activities for goods and services (Lager 2010). Around 80 percent of the surveyed Macedonian companies introduced process innovations in the period 2010-2013. Almost one third (28 percent) introduced new or significantly improved methods for manufacturing goods and services, while 18 percent introduced both, significantly improved logistics delivery and distribution processes and significantly improved supporting activities.

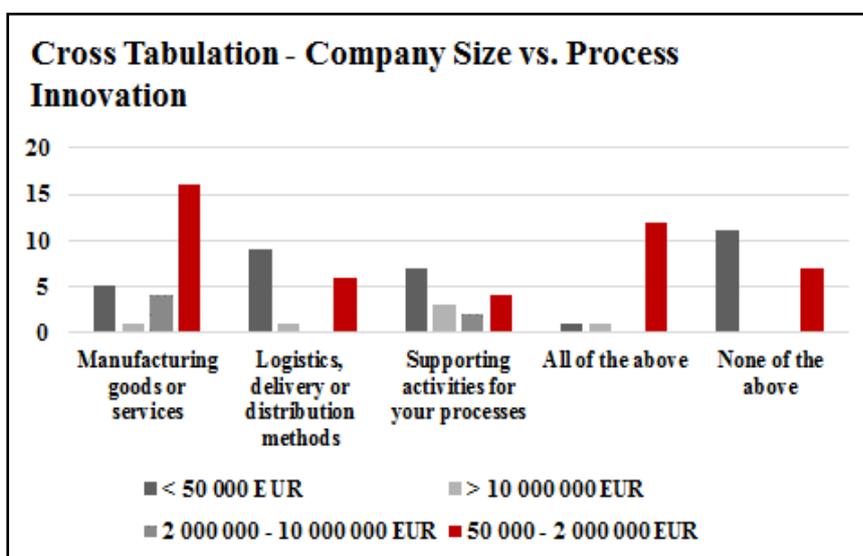
Figure 2-10. Process Innovations (2010-2013).



There were companies that introduced significantly improved processes across the organisation (15%). Similar to the findings in the section on the product / service innovation, one fifth of the surveyed companies did not introduce any improvement in their processes – Figure 2-10.

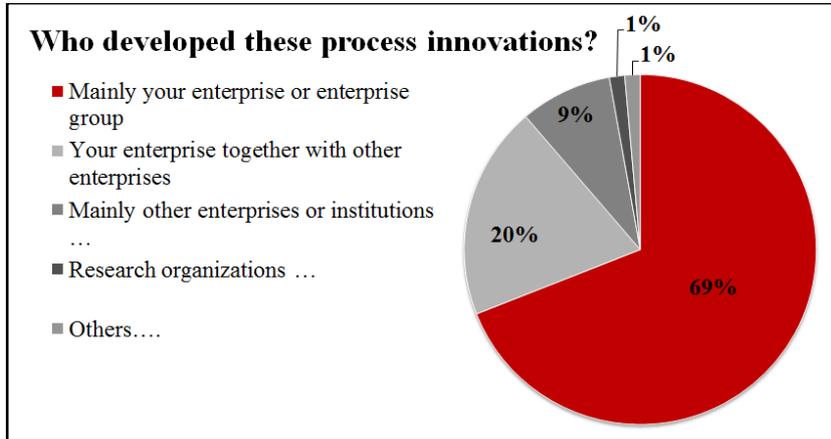
Similar to the product/service innovation, the cross tabulation with company size reveals that the largest innovators are the companies with annual revenues in the range of 50 000 – 2 000 000 EUR – Figure 2-11.

Figure 2-11. Company size vs. Process Innovation



The prevalence of the closed innovation models in managing of process innovations i.e. more than two thirds of the companies developed the process innovations in-house (69 percent),

Figure 2-12. Who developed these process innovations?

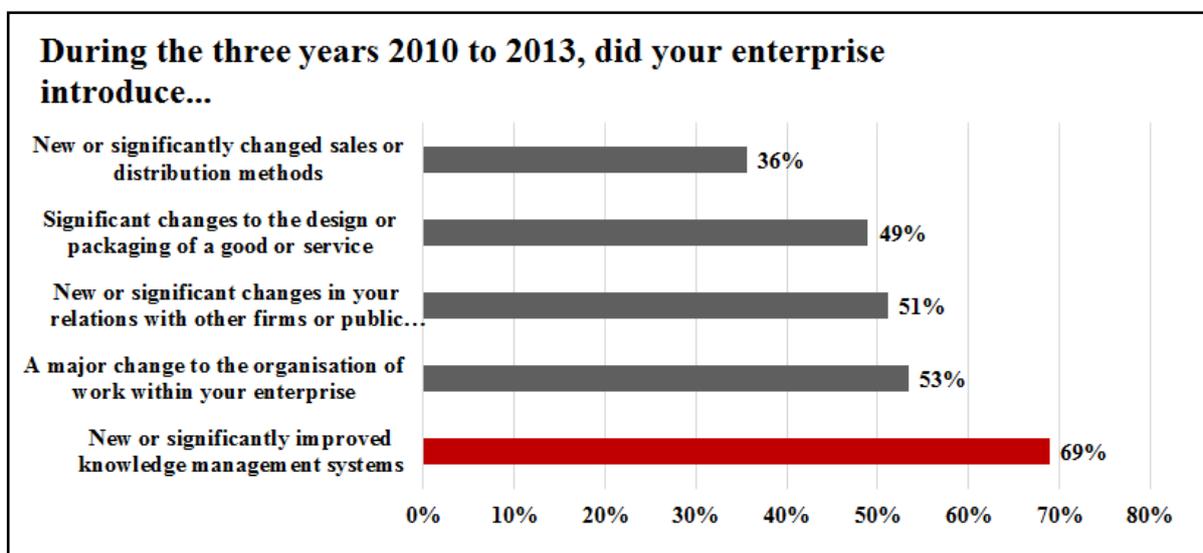


implies that Macedonian companies are mainly closed when it comes to sharing their internal development plans and searching for new sources of knowledge on process improvements from outside sources of their organizations – Figure 2-12.

2.4.3 Organisational and marketing innovations

An organisational innovation ‘is the implementation of a new organisational method in the enterprise’s business practices, workplace organisation, or external relations’ (OECD, 2005, p.51). A marketing innovation ‘is the implementation of new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing’ (OECD, 2005, p. 49). Thus, only in the third edition of the OSLO Manual were marketing and organisational innovations granted the status of innovation activities, (potentially) independent of technological innovations. As a result, they have been included in the survey of the Macedonian companies.

Figure 2-13. Type of Organisational/Marketing Innovation Introduced.

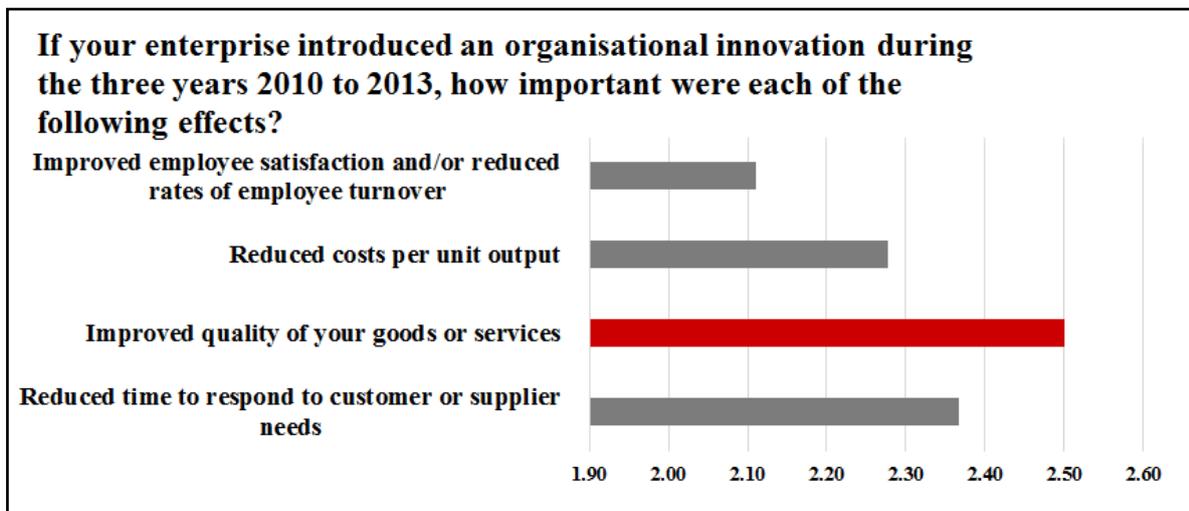


Findings imply that concerning organizational and marketing innovations, the surveyed companies in the period 2010-2013 predominately invested in organisational innovations, i.e. more than two thirds of the companies invested in new, or significantly improved knowledge

management systems, while more than half of the enterprises implemented new or significant changes in their relationship with other companies and public institutions. Investments in marketing innovations have been lower compared to the organisational investments, with one third of companies (36 percent) investing in significant improvements of the sales and distribution methods, and almost half (49 percent) investing in the design and packaging of their products and services – Figure 2-13.

Enterprises which invested in organisational innovation in the same period (2010-2013) did so because they worked on the improvement of quality of goods and services (medium (2) to high (3) importance on the graph = 2.5), and/or wanted to reduce the time to customer or supplier needs (value of 2.35) – Figure 2-14. The least important factor was the employee satisfaction, which holds the potential of growing in importance in the future as it can positively affect the other factors.

Figure 2-14. Importance of the Impact of the Organisational Innovations

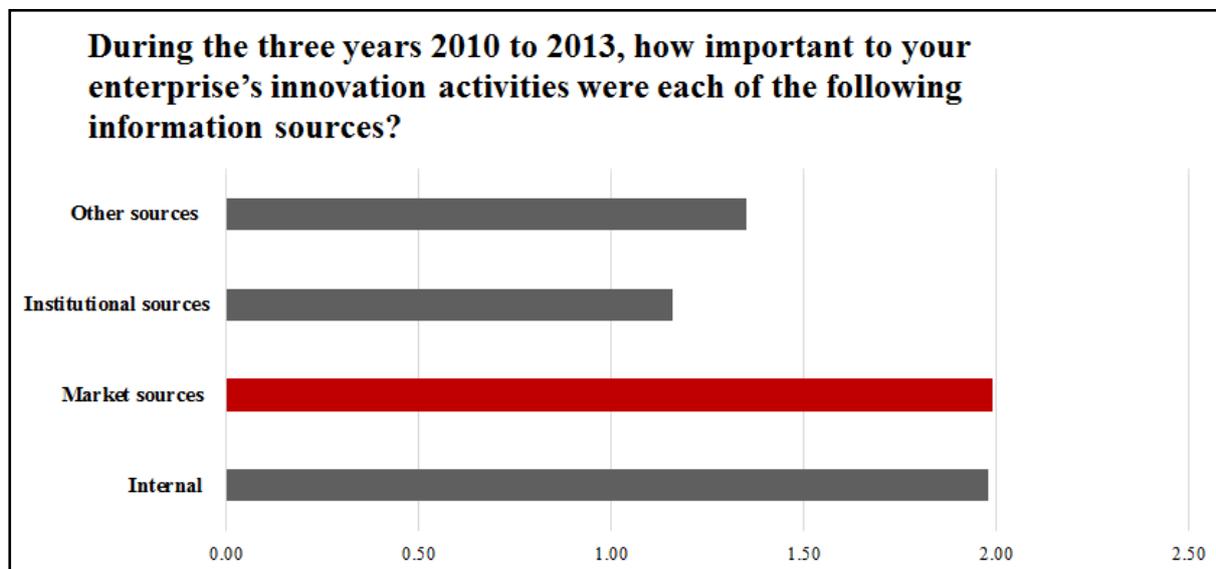


2.5 Sources of information and co-operation for innovation activities

There is considerable debate among scholars on innovation management about the generation of innovation ideas and their use, along with the relative importance of various sources of information. A particular concern has been placed on the balance between internal and external

sources of information, and, amongst external sources, the balance between public and private information sources.

Figure 2-15. Innovation Information Sources (2010-2013).



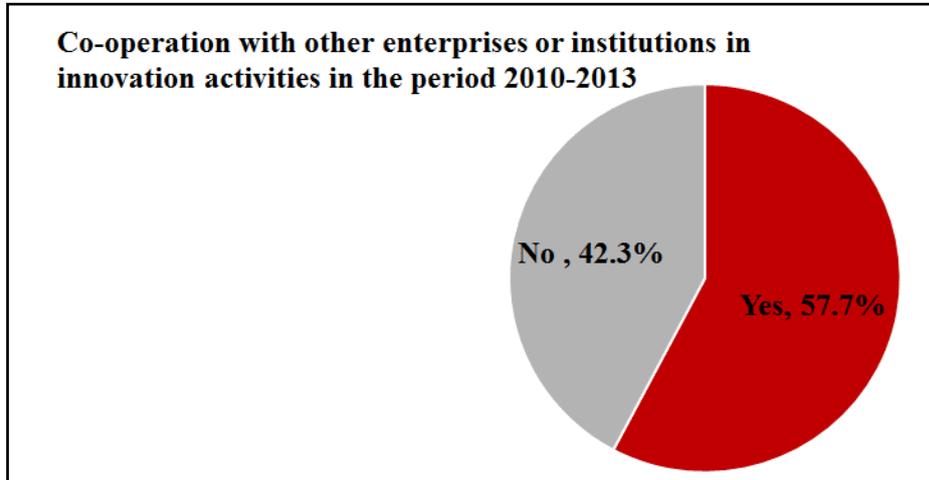
In terms of the importance of information sources for the surveyed Macedonian companies, Figure 2-15 shows the following:

- Internal and market sources are the most important information sources for innovations in the enterprises in Macedonia;
- Other sources (conferences, fairs, associations, etc.) along with institutional sources, covering universities and the public sector, are the least important sources of information. However, levels of use vary considerably across different sectors.

The open innovation approach explicitly identifies the integration of inward and outward knowledge transfer through emphasising the role of cooperation activities and networks (Chesbrough 2006, Lichtenthaler 2011). This integration is the essence of the open innovation approach (Lichtenthaler 2008, 2011). The topic has attracted a remarkable attention by researchers, and a growing number of empirical studies on the topic which have demonstrated that, subject to certain qualifications, cooperation typically affects innovation activities positively, both in terms of the propensity to innovate and the intensity of innovation (Grönlund 2010, Trott and Hartmann 2009). To date, much of the academic literature has been concerned with the importance of locality, with local innovation systems, clusters and similar cooperation entities. Findings presented on the Figure 2-16 support this statement and show that national cooperation is applied by more than half of the surveyed Macedonian enterprises. When it comes to the co-operation partner and location, the cooperation with government, public research institutes, clients, and other enterprises at a national level in Macedonia is well

established, while cooperation with the EU member, and non-EU member states are not well established.

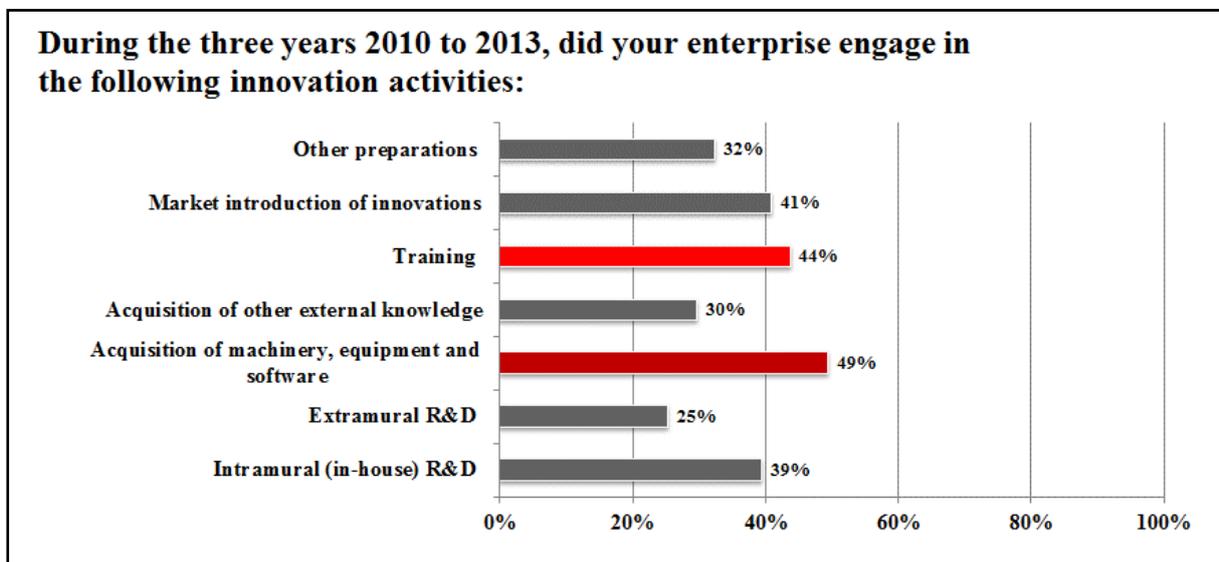
Figure 2-16. Cooperation with other Enterprises or Institutions



2.6 Innovation activities and expenditures

Although innovation outputs are not simply a function of innovation inputs, one would expect them to be highly correlated. More importantly, innovation related expenditures provide a broad indication of investments in business experimentation. That is, in making speculative investments aimed at qualitatively improving the value of an enterprise’s resources and activities – Figure 2-17.

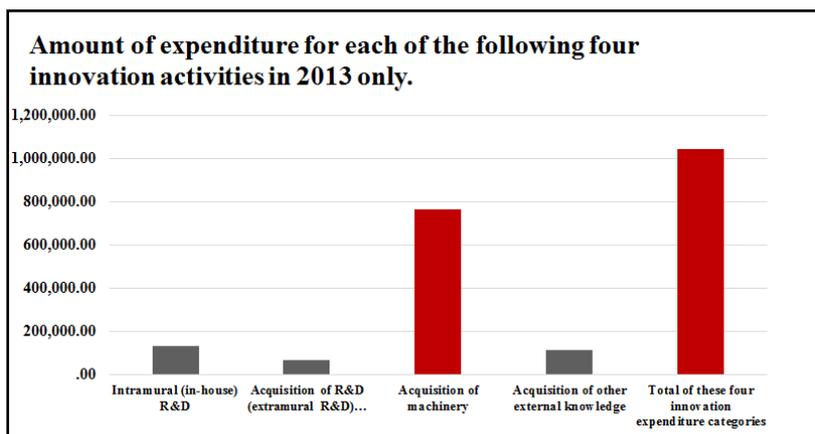
Figure 2-17. Type of Innovation Activities (2010-2013)



Survey findings imply that:

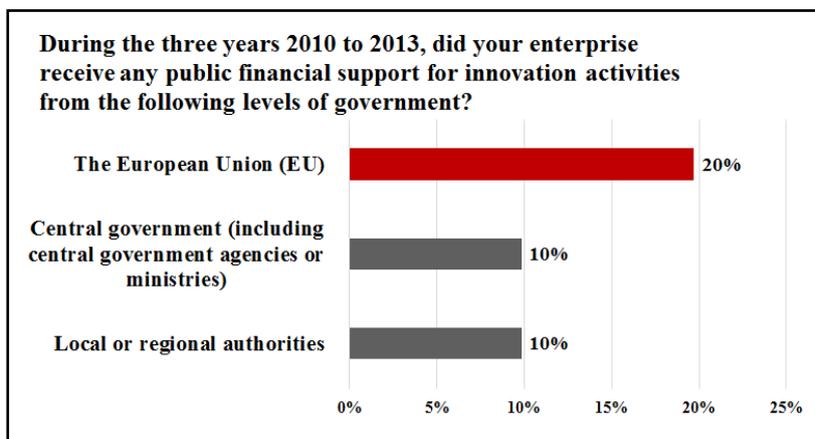
- Macedonian enterprises appear to spend proportionately more on training and acquisition of embodied technologies; and proportionately less on external (extramural) R&D and acquisition of external knowledge (know-how);
- The acquisition of machinery equipment and software (embodied technologies) is where enterprises most often invest (49 percent);
- Training is already playing the most important role amongst innovative Macedonian enterprises. Almost half of the surveyed companies engage in training activities.

Figure 2-18 Amount of Expenditure used for Innovation Activities



The actual amount of spending on these innovation activities is in the range of 70.000 MKD to 1.200.000 MKD in total, with the spending on acquisition of machinery and equipment leading the way at 760.000 MKD – **Error! Reference source not found.**

Figure 2-19. Public or other funding for Innovation Activities.



The majority of the surveyed companies used their own resources to finance their innovation activities in the period 2010-2013. A small percentage of the companies received funding from the central and the local government (10 percent) and around 20 percent said they have received some type of

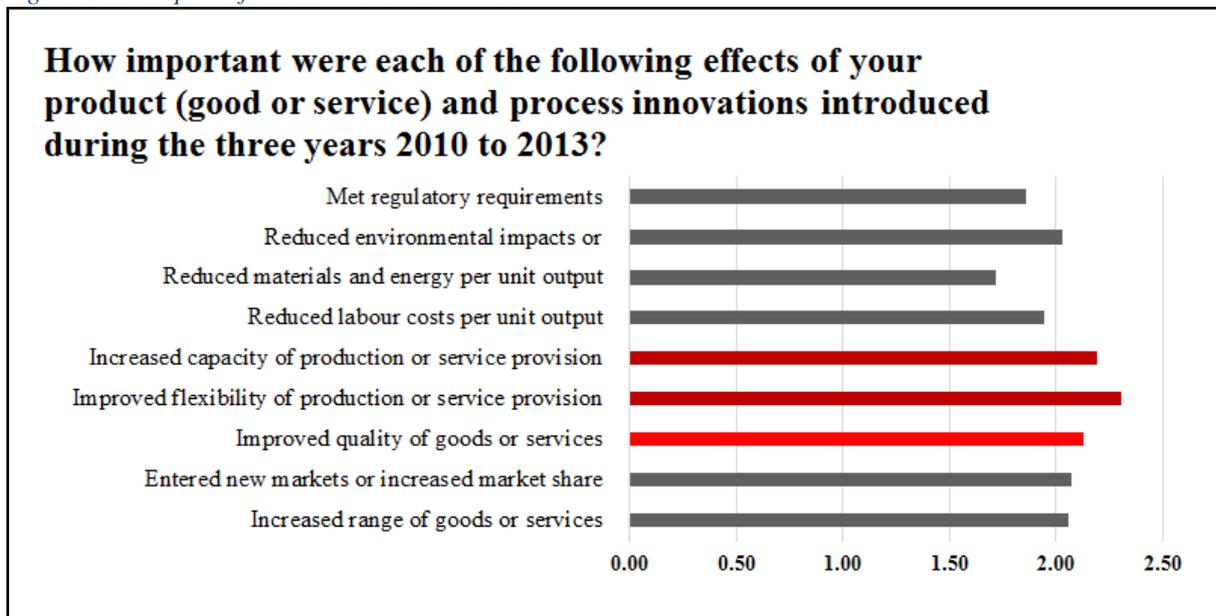
funding from the EU and EU member states – Figure 2-19.

The poor use of local, national and international funds along with the lack of internal funding remains a major obstacle for the implementation of innovations in the country.

2.7 Effects of Innovation

In assessing the level of innovation in Macedonia, it is important to look beyond the simple frequency of new product and process introductions in order to gauge the wider implications and impacts of the innovative activity.

Figure 2-20. Impact of the Innovation Activities.

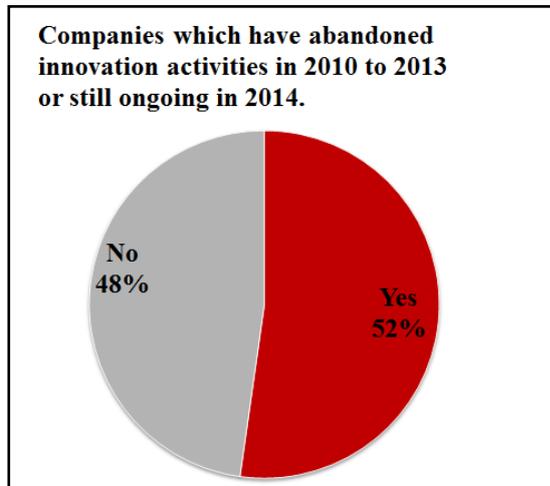


By introducing a scale from 1 (low) to 3 (high) in importance, from Figure 2-20 it was possible to learn that:

- Half of the enterprises placed high importance to the ‘improved flexibility of production or service distribution’ along with ‘the importance from the introduction of the product/service innovations’, followed by ‘improved quality of goods and services’, ‘entering new markets’, or ‘increasing market share’, and ‘increased capacity of production or service provision’.
- According to more than a half of the surveyed companies, the product/service innovations had medium influence over the ‘increased range of products and services’.
- Around half of the enterprises agree that ‘the product/service innovations had the lowest influence’ over the ‘reduced materials and energy per user output’.

2.8 Factors hampering innovation activities

Figure 2-21. Abandoned Innovation Activities.

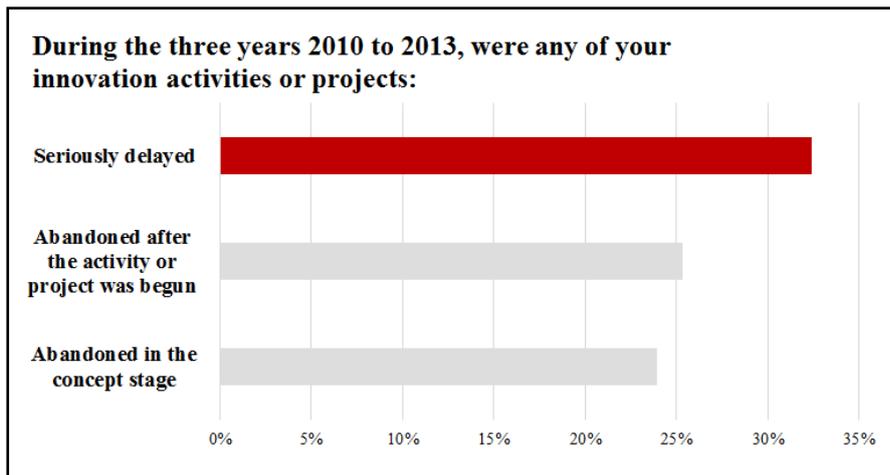


Almost half of the innovation activities and projects of the surveyed companies in the period 2010-2013 were seriously delayed (52 percent) – Figure 2-21. Around 30 percent were abandoned in the conception stage, while one fourth (25 percent) was abandoned after activity or project had begun – Figure 2-22.

Beyond resource considerations (as indicated by skills and expenditures), the academic literature is increasingly concerned with the extent to which perceived barriers to innovation hinder innovative activity. Here the perception is more important than any objective measurement of constraints. If

the enterprises perceive a difficulty, they are likely to react to it regardless of its objective basis. To date, much of the debate (often focused upon smaller enterprises) has been concerned with the existence of financial constraints to innovation; however, more recently there has been an

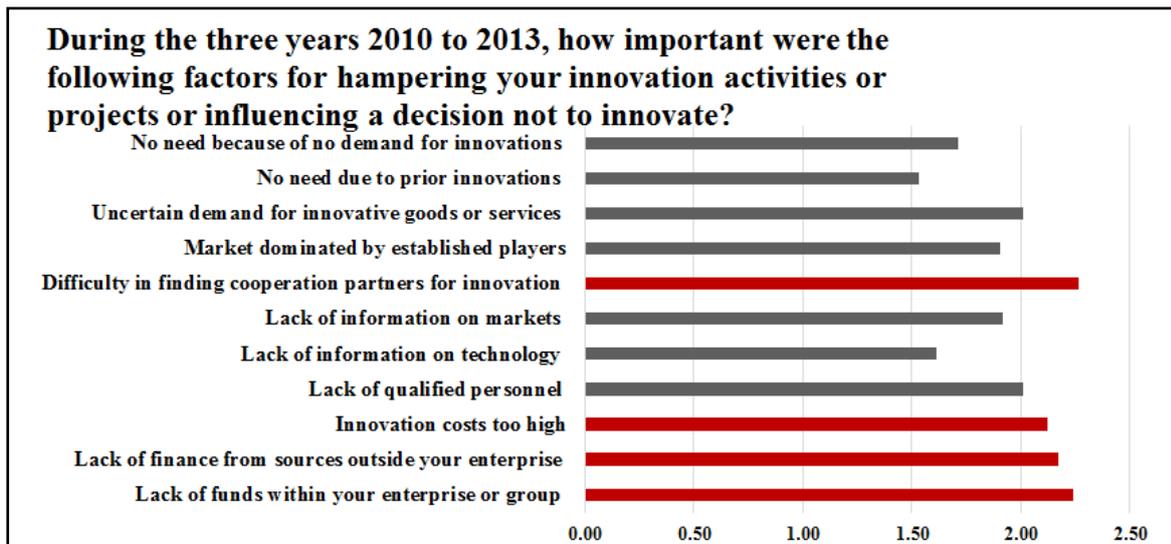
Figure 2-22. Delay of the Innovation Activities.



increasing tendency to argue that enterprises are, in fact, ‘know-how’ constrained, rather than financially constrained. That is, access to adequately qualified personnel may be the principal barrier to innovation for most companies.

By introducing a scale from 1 (low) to 3 (high) in importance, it was possible to learn that lack of finances, both, within the enterprise /group and from sources outside the enterprise are the most highly perceived barriers in innovation-active Macedonian companies, along with the difficulty for finding the right cooperation partner, followed by an uncertain in demand for the product or service, and the lack of qualified personnel –Figure 2-23.

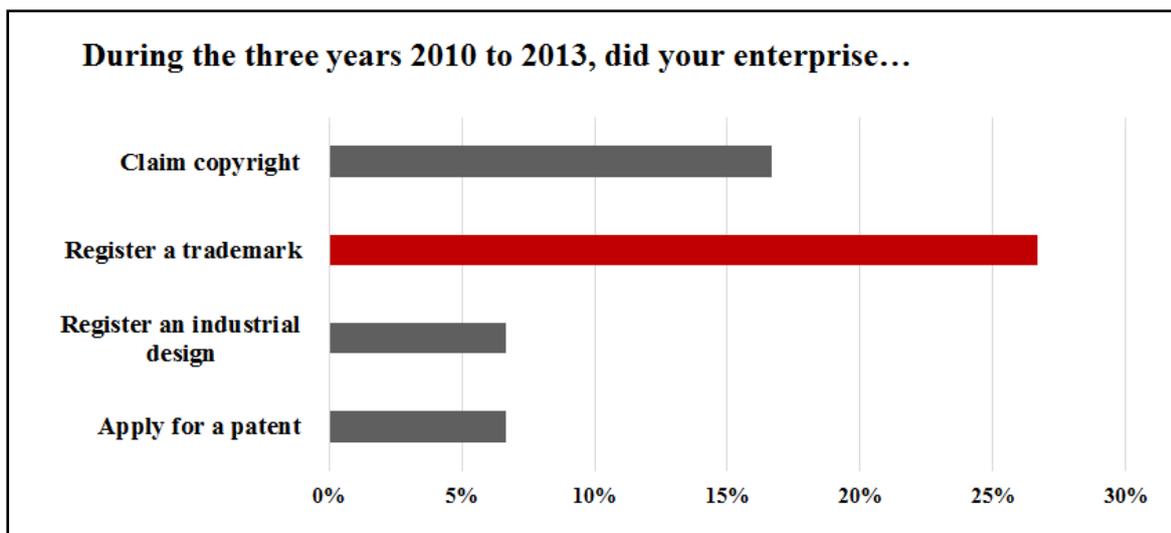
Figure 2-23. Factors which constraint Innovation Activities (2010-2013).



2.9 Intellectual property rights

Intellectual property rights include patents, copyright, industrial design rights, trademarks, trade dress, and in some jurisdictions trade secrets. Around one fourth of the surveyed companies in Macedonia registered for a trademark, only 6 percent registered for an industrial design and/or applied for a patent, while 14 percent of the surveyed companies claimed a copyright – Figure 2-24.

Figure 2-24. Intellectual Property Protection (2010-2013)



These findings are in line with data on registered IP in the country, which are collected by the Agency for Protection of the Intellectual Property, along with the findings of the GCR which ranks Macedonia at the 91st position by the number of patents per a population of a million. It implies that Macedonian companies lack awareness and knowledge for the importance of protecting innovations.

2.10 Summary on the Survey of Innovation Activity

The results from the study for Profiling Macedonia's innovation performance indicate that 78% of the surveyed Macedonian companies in the period 2010-2013 were involved in some type of an innovation activity (product/service innovation, process innovation or organisational/marketing innovation), invested in innovations which are not yet complete, or innovation projects which have been abandoned, and/or had innovation-related expenditures.

The main obstacle to introducing innovations in Macedonia comes from the fact that companies have difficulties with the commercialisation of their ideas. They are not aware of their innovation capacities, and how to commercialise their existing resources, platforms and knowledge. This is confirmed with the findings on the revenue structure. Almost two-thirds of their revenues come from their old products and services, around 13 percent from the products and services new to the company, while 20 percent from new products to the market.

Another significant challenge arises from the lack of finances, or the lack of information for the financial sources available to companies in Macedonia. More than half of the surveyed companies abandoned their innovation projects, mainly because of the uncertainty of the markets, the strong competition, the lack of suitable partners, and the finances. Furthermore, findings imply that Macedonian companies annually invest in equipment, in improving production processes, buying software, and other types of capital investments, as well as in trainings of their employees, and in intramural R&D activities.

In general, and despite the fact that more than half of the surveyed companies tend to use closed innovation models, one may argue that there is a balance in the open and closed innovations approach, where the dominant information source is a combination of internal and market sources (clients, suppliers and competitors – direct spillovers). Unfortunately, the cooperation with Universities and Research centres is assessed as low. These findings support the findings from the Global Competitiveness Report (GCR) on the nature of the innovation activity in the country.

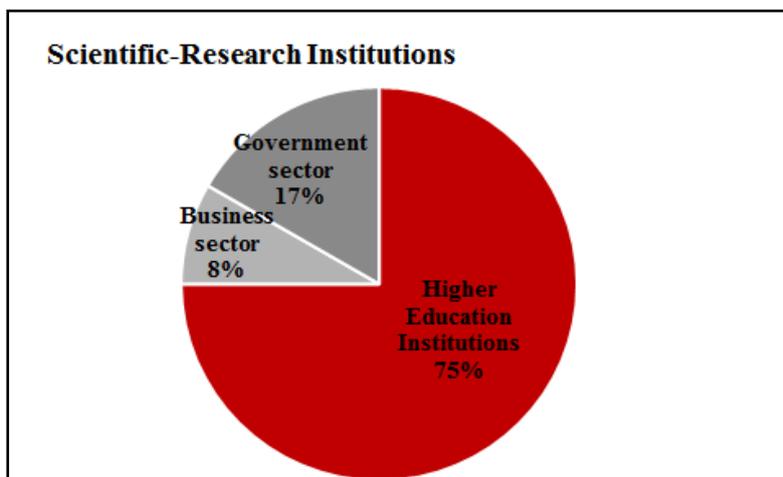
Chapter 3 Innovation landscape in Macedonia

Macedonian companies operate in an external context, which can either be conducive to their activities, act as a catalyst in opening up opportunities for growth of innovation activities, or it can be an obstacle to the growth of their ideas, if in the country there is no innovation- friendly environment. For assessing the external context for innovations in Macedonia, the study looks at the situation with the availability of scientific-research institutions, the number and scope of research projects in these institutions along with the R&D in the businesses sector, and the forms for cooperation with the business sector (clusters). The study as well looks at the role of the Foreign Direct Investors in the area of technology transfer.

3.1 Scientific Research – Areas and Expenditure

According to the State Statistical Office (2015), there are 77 research organisations in the country which employ in total 7842 researchers. The breakdown according to sector (business, government and higher education) is provided in Figure 3-1.

Figure 3-1. Scientific-Research Institutions – Breakdown.

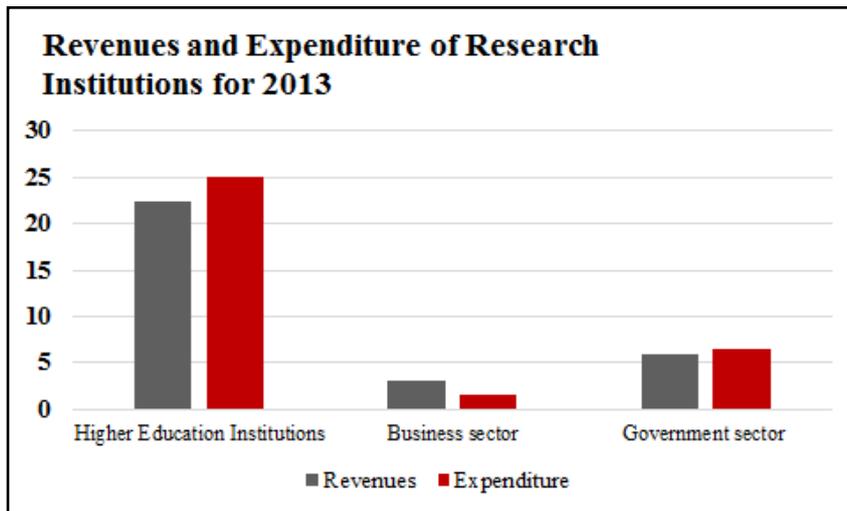


Scientific research and experimental development cover creative and systematic work, designed and intended to increase the knowledge of people, culture, and society; scientific research and development that can be conducted through basic /fundamental, applied, and experimental research. The latest statistical data on the scientific research in

Macedonia available from the State Statistical Office (2014) identifies a total of 413 research projects in 2011, out of which 169 were finished, and 244 in the implementation process. The majority of finished research projects were in the engineering disciplines (116), followed by the business sector (66), higher education sector (65), government sector (38), and others. Therefore, it can be concluded that technology related scientific research prevails with almost 50% of the total scientific activities in the country (State Statistical Office 2015).

The *total revenue* from the research and development organizations in 2013 in Macedonia was 31,3 million EUR. The higher education sector participated with the highest percentage in the total breakdown, i.e. with 22.3 million EUR; the government sector with 6 million EUR; while the business sector with less than 3 million EUR. Similar as with the provision of total income, the higher education sector had the highest expenditure from the research and development activities (25,8 million EUR), the government sector had 6.5 million EUR, and the business

Figure 3-2. Revenues and Expenditures of the R&D Institutions in 2013.



sector only 1.6 million EUR (State Statistical Office 2015). In general the figures infer inefficiency of the research centres in ownership of the government and the public sector, as the expenditure of both are lower compared to the revenues. The same is a product of the lack of commercialisation of the research results and confirm the findings from

the study for the existence of a poor connection of the HE and government research centres with the businesses – Figure 3-2.

As the lack of coordination in the technology-transfer area is not a novelty for the Macedonian government, a recent World Bank supported project implemented by the Austrian consortia WUS Austria and AUSTIN Pock + Partners, works on the establishment of a National Technology Transfer Office – NTTTO in Macedonia.

3.2 Cluster organizations in Macedonia

Although there are different definitions presented by different scholars, a wide agreed definition of clusters defines them as “ geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standard agencies, and trade associations) in particular fields that compete but also cooperate” (Porter 1998, p. 197-198). The clusters as a form of partnership allow the companies to develop unique knowledge and skills, which further enable them to be more innovative and productive.

A cluster is a product of different conditions. Member-companies must have a clear and shared mission and perception about the cluster, as well as a clear leadership and management. There should be a strong support by the relevant stakeholders, and finally, there must be a high level of trust among the member-companies in the cluster (National Cluster Atlas 2013).

Many studies worldwide indicate that the existence of industry clusters provide an access to skills and know-how, new technologies and R&D activities. For example, when it comes to clusters in the food production industry the main benefit is the possibility to perform R&D activities at a cluster level. The lack of finance can set back the companies in this sector; however, by sharing the research costs within the cluster, they are in a position to increase their know-how in food production and food technology (OECD 1999). Clusters create benefits for

both, the businesses and the communities where they operate. They provide higher effectiveness and efficiency through enabling the development of special skills and know-how, and foster the innovativeness of the companies in the cluster. This often results from the close interaction with customers, as well as from the share of knowledge, through creation of new ideas and possibilities.

When it comes to Macedonia, the Ministry of Economy supports the development of clusters at a national level, while the Ministry of Local Self Government at regional and local level. The Macedonian Competitiveness Activity Project for the first time initiated the creation of clusters in 2002, with the goal to help companies in Macedonia develop their skills and competitive advantage in order to become more competitive at the international market (National Cluster Atlas 2013). The fruits of this initiative were clusters as MASIT, Tikvesh Wine Route, and TTA-TC, which are nowadays among the most successful clusters in Macedonia.

The research and publications show that there are around 20 business clusters in Macedonia in 2013. The Ministry for Economy prepared the National Cluster Atlas (2013), publication where a detailed picture for these clusters is provided, covering short profiles of the clusters, their contact and general information, as well as the companies that are part of each specific cluster.

1. MASIT - Chamber of Commerce of the ICT Companies of Macedonia

One of the first clusters established in Macedonia is the Macedonian Chamber of Information and Communication Technologies –MASIT, a non-profit chamber of commerce, founded as an Association in 2000 at the initiative of the top 15 IT companies in Macedonia. MASIT functioned as an Association under the Economic Chamber of Commerce of Macedonia until April 2007 when they transformation into independent Chamber. Today their membership includes around 80 companies of software, IT services, hardware distributors, telecom companies, training centers, and ICT consultants, which covers almost 80% of the IT industry in Macedonia (MASIT 2014).

2. TTA-TC Textile Trade Association- Textile Cluster

Textile Trade Association was founded in October 2003 on the initiative of more than 120 companies that cover more than 70% of the domestic employment, while one year later they become Textile Cluster. Finally in 2006 they were established as “Textile Trade Association – Textile Cluster” - TTA-TC, a non-profit, non-government organization with the goal of improving the competitiveness of the companies, and creating conditions for improving the textile industry in the country. Nowadays, they have around 65 member companies and collaborate with organization and clusters from Brussels, Albania, Bosnia, Croatia etc. (TTA 2015).

3. MAP Macedonian Association of Food Processors

MAP is the Macedonian Association of Processors, founded as a non-profit organization in March 2002. The main activities covered within the operations of the Association include (1) organizing joint purchase of raw materials in order to produce more competitive final products,

(2) taking part in all meetings related to the processing industry in Macedonia, (3) creating an environment for joint export of MAP members' products, etc. MAP has a total of 26 member companies in the cluster working on the further development of the fruit and vegetables processing industry, and on increasing the overall economic growth in the country (MAP 2015).

4. CDI - Macedonian Wood Processing Industry Cluster

The Wood Processing Cluster was established in 2007 with the main idea to associate the manufacturers in the wood industry in order to achieve certain goals in the interest of the members of the cluster and the overall economy in the country. Today CDI have 56 member companies from all over Macedonia, it is connected with the Southeast European wood industry, and it is member of the UEA- Association of furniture companies in Europe (Klaster Woods 2013).

5. TWR - Tikvesh Wine Route Foundation

The Foundation Tikvesh Wine Route is cluster founded in July 2006 by the municipalities Kavadarci, Negotino, Rosoman and Demir Kapija. It is a cluster established with the goal to promote tourism, food and wine. TWR is composed from 36 members with the same vision to transform TWR in order to become leader in the wine sector in South East Europe (Tikves Wine Route 2015).

Apart these clusters, which have been assessed as the most important ones, there are more which show potential for future growth as a result of the investment and the direct investment in the area:

6. ACM - Automotive Cluster of Macedonia
7. Confectionery Industry Cluster
8. Agro-Helix
9. Dairy and Meat Cluster
10. Macedonian Fashion Formation
11. EDEN - Tourism Cluster of Southwest Macedonia
12. Tourism Cluster Osogovo
13. Tourism Cluster in Polog
14. Agricultural Machinery Cluster
15. Rice Cluster
16. Seeds Cluster
17. Agriculture Cluster
18. Milling and Baking Industry Cluster
19. MAC Bee.org
20. Association of Organic Growers Organica

Clusters development and implementation is supported within the Innovation Strategy of the Republic of Macedonia 2012-2020. There is a separate section of the strategy, focused strictly on increasing the flow of knowledge and interaction between actors in the innovation sector

under which is the project for 'Fostering business networks and clusters'. The Ministry of Economy, the Agency for Promotion of Entrepreneurship of the RM, and the Association of Clusters, are the responsible partners in this project, covering census of the total number of clusters, initiation and development of new clusters, and increasing the jobs within the clusters.

3.3 Foreign Direct Investments and Knowledge Transfer

Foreign Direct Investments have for long time been recognised in literature as being a valuable source of new technology and knowledge for the host economy. Within the FDIs, multinational enterprises play a key role, especially in developing countries like Macedonia, and for the process of transferring new technology stimulating economic development (growth) and industrialisation (Barro and Sala-i-Martin, 1995; and Romer, 1986). Technology can be incorporated in a new production process, a new product, in research and development capacities, and in upgrading the labour skills of the subsidiary (management skills, skilled labour force and entrepreneurship). Similarly, technology transfer may lead to an increase in efficiency of the economy (efficiency spill over). The knowledge about the technology could be transferred through employee and management training, which familiarizes workers with unknown technologies and upgrades their skills, and through them, these skills might be transferred to the rest of the industry (Batra and Tan, 2002).

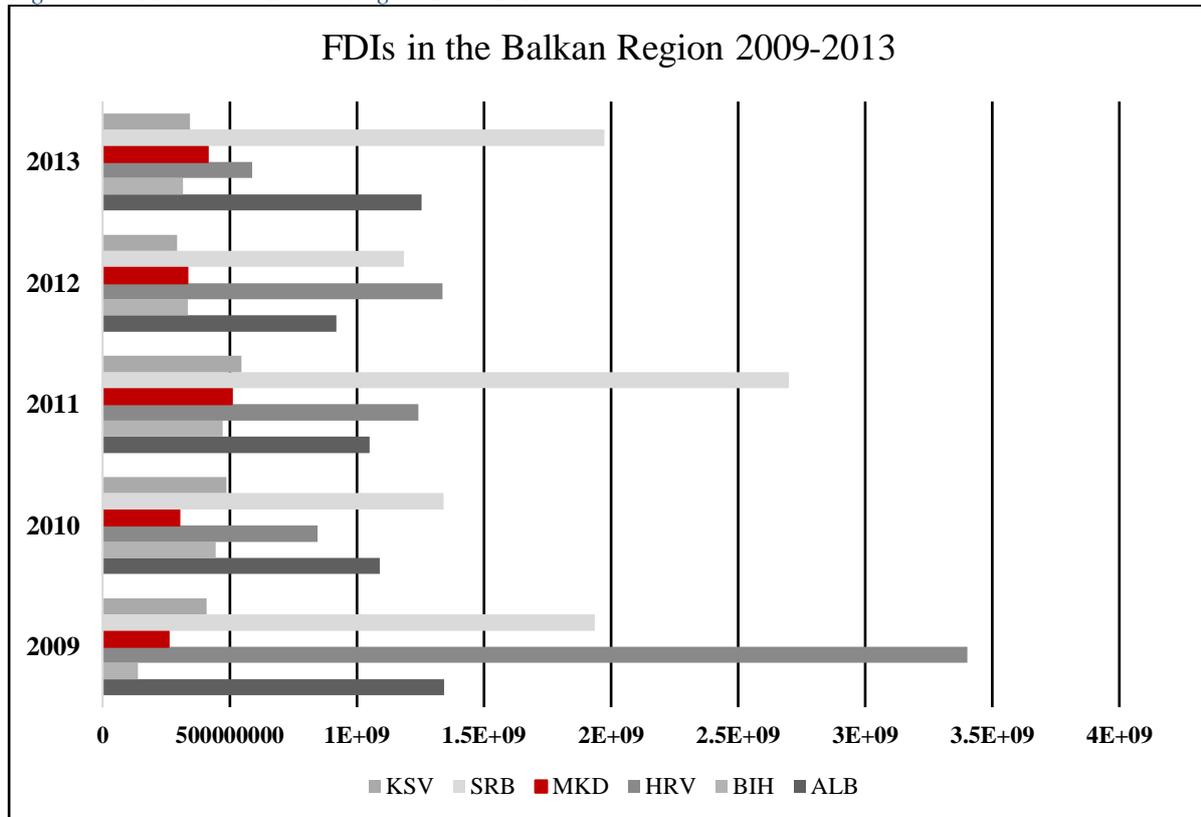
Technology spillover is more likely to be significant when the gap between MNEs technology level and that of the local industry is large. The entrance of foreign firms affects the structure of the host economy and the performance of the local firms (spillover effect for related industries). The entrance of MNEs triggers the development of related industries that recognize the opportunity and quickly develop new products and services required by the MNE. The services sector, in particular, gains a lot from the presence of MNEs, since their operations necessitate the existence of banks, insurance companies, financial consultants or financial intermediaries, thus providing incentives for those industries to seek improvements and development.

Understanding the significance of FDIs, especially the MNEs as a source of technology transfer, and thus a driver for increasing the innovation of local and national companies, Macedonia undertook a series of activities in the past decade, which goal was to attract Foreign Direct Investors in the country. The country has 5 Ministers for promotion of Foreign Direct Investments, a network of Economic Promoters in almost all diplomatic offices, an Agency for FDIs and Export Promotion, and a Directorate for Free Technological Zones. All these actors are focused on targeting Greenfield investors, as there are not many opportunities for acquisition in the country, and work in several technologically intensive industries as is the automotive.

The strategy is based on a large pool of incentives and privileges for the investors, which are not novelty in global terms; however, were unprecedented in the region. Since its inception the approach has been copied by the regional countries resulting into an intensive regional rivalry for FDIs.

In the period 2009-2013, Macedonia attracted 1.8 billion USD (World Bank 2015). Compared to its neighbours, the numbers have been below the expectations and planned projections; however, the quality of the attracted FDIs has been stronger compared to the countries in the region. Macedonia attracted mainly Greenfield investors who opened new jobs and brought sophisticated technology. These companies, among which are Dräxlmaier, Johnson Controls, Johnson Matthey, and Van Hool, can be an excellent source for technology and knowledge transfer, which can increase the innovation capacity of the Macedonian economy.

Figure 3-3. FDIs in the Balkan Region 2009-2013



The net trade balance between export and import activities of the companies in the technological zones is positive; however, the difference is very low (133 million EUR). The same suggests that these FDIs operate as enclaves with low spillover effect for the rest of the economy. Official sources from the Technological zones claim that in 2013 more than 500 Macedonian companies cooperated with the companies located in the zones, and received contracts in value of 50 million EUR.

In general, there are three reasons for the rather poor level of vertical spillovers from the present MNEs to the local suppliers. First, MNEs tend to use global supplier contracts because the same increases the efficiency of their value chain. Second, even in the area where these companies do not use global suppliers, majority of the Macedonian companies do not meet the technology requirements and the quality standards to be considered as suppliers. Third, the actual number of MNEs in Macedonia is low. Having 500 companies which cooperate with less than 20 companies operating in the zones, sounds too good to be true. Therefore, one should take these data with caution, as 500 Macedonian companies, which cooperated with the MNEs

subsidiaries in the zones in 2013, does not imply that all of these companies were suppliers. In simple words, many of the FDIs in 2013 were in the entry phase of their operations and used construction companies that are usually of local origin.

In general, figures on the activity of MNEs in the country in 2009-2013 indicate a low spillover effect to the local companies, absence of more serious technology transfer, and insignificant impact for the innovation capacity of the Macedonian economy. Having in mind the current stage of entry for majority of the MNEs, it is quite possible that the current situation is temporary, and that the spillover will intensify in the future. The more the Macedonian companies invest in improving their technology and quality of work, processes, and products, the better the prospects for solicitation of supplier contracts for the MNEs operating in the zones.

Chapter 4 Funding of Innovation in Macedonia

4.1 National Funding Opportunities

At national, regional and global level, innovation and creation of new technologies are supported by developing adequate eco-systems made out of human capital, access to finance, intellectual property protection, and a favourable business climate. With an aim of developing the innovation capabilities on national level and bringing the competitiveness of the economy closer to the EU, Republic of Macedonia developed and adopted a National Strategy for Innovation 2012-2020, which covers all of the above mentioned conditions, and aims at creating a favourable national innovation eco-system.

According to the National Strategy for Innovation 2012-2020, the main limitations when it comes to developing the innovation capacity of companies in Macedonia, are the poor access to finance and the lack of absorptive capacity in SMEs. These weaknesses in the national financial sector have hindered the development of companies' capacities to invest and potentially innovate. To compensate for the lack of adequate funding, the Macedonian government launched a Fund for Innovation and Technology Development – FITD, in November, 2013.

The Fund aims at supporting innovation and R&D activities in small and medium-sized enterprises. It is financed by a loan from the World Bank in a value of €8 million, an amount which is going to be spent over the next three years 2015- 2017. The Fund will finance activities and innovation projects in ICT, agriculture, tourism, and renewable energy, preferably with a local collaboration agenda. Similar activities are envisioned for the university spinoffs in order to support the collaboration between the Universities and SMEs, and thus foster the collaboration in this area as well. FITD aims at becoming the central institution for developing and implementing the national policy for innovation and technology development which will considerably contribute for the socio-economic progress and improvement of Republic of Macedonia (FITD 2015). FITD's mission is to boost the innovation processes within micro, small, medium and newly formed companies, as well as to support the technology development, in order to increase their competitiveness based on research, innovation and know-how transfer.

The Fund has two main priorities:

- Improved access to financial support for innovation and technology development; and
- Promotion and enhancement of innovation activities.

These priorities FITD aims to achieve through their four instruments for fostering development and innovation in Macedonia (FITD 2015):

1. Co-financing Grants for Start-up, Spin-off Companies and Innovations;
2. Co-financing Grants and Conditional Loans for Commercialization of Innovations;
3. Co-financing grants for Technology Transfer; and
4. Technical Assistance through Business-Technology Accelerators.

4.2 Other Funding Opportunities

4.2.1 Macedonian Bank for Development Promotion

The Macedonian bank for development promotion has the main objective to support small and medium enterprises' development through credits, as well as to promote export (MBDP 2015). MBDP is a state owned bank with an objective to perform specific financial activities according to the Law for establishing MBDP. MBDP's product array covers three different types of products (MBDP 2015):

1. **Lending** - available for small and medium enterprises, and export oriented companies, registered in Macedonia.

The types of loans cover export credit financing, SMEs financing, credit support to agriculture and agroindustry, micro financing, financing energy projects, loans for reducing unemployment, and loans for accommodation facilities.

2. **Credit Insurance** – “in order to help the Macedonian companies which sale on credit, the Macedonian Bank for Development Promotion provides short-term insurance of receivables against commercial and politic risks” (MBDP 2015).

The products covered within credit insurance are: 1) domestic accounts receivable (pre- and post-shipment), and 2) export accounts receivable (pre- and post-shipment). The main goal of the insurance credit is to deliver secure receivables collection, to improve the liquidity of Macedonian SMEs, to help in acquiring new markets, and to ease the access to funds.

3. **Factoring** as a product offering sale of products and services with different type of payment, while part of the invoice value is received in advance. This is MBDP's newest product, exclusive on the market in Macedonia.

The benefits of factoring are sorted out in several sections, mainly covering improved cash flow and liquidity, different options for investing, extension of the paying period, better management processes, and higher quality of financial information (MBDP 2015).

4.2.2 European Bank for Reconstruction and Development – EBRD in Macedonia

The European Bank for Reconstruction and Development was founded in 1991 with the goal of fostering the transition of market economies through promoting innovation, growth and transparency. They core values cover the development of sound investment climate and promotion of environmentally and socially stable development (EBRD 2015).

EBRD is active in Macedonia since 1993, with 97 projects financed to date, in the range of € 1.5 million (EBRD 2015). In Macedonia EBRD is mainly focused on supporting country's entry in the regional and global markets, particularly on strengthening the collaboration with some of its main partners as are the European Union and the European Investment Bank. The bank assists through supporting the development of transportation corridors, and through promotion

of the private sector development, and cross-border cooperation. EBRD's key challenges covered within the Macedonian Strategy are:

- Enhancing competitiveness and facilitating private investment in the corporate and municipal sectors;
- Promoting energy efficiency and sustainable energy; and
- Advancing regional integration;

EBRD Programme for enhancing the competitiveness and facilitating private investments in the Small Businesses Support (SBS), offers know-how to SMEs in different areas: strategy development, marketing, organisation, business processes, IT, quality management, energy efficiency, environment, and financial reporting. This grant is available for companies with less than 50 employees, and is within max of 10 000 EUR of financial support.

4.2.3 Macedonian Business Angels Network

Another source for financing innovations in Macedonia open to SMEs and start-ups are the Business Angles. Supported by USAID grant, the Business Angels Network, was founded in 2007 with the main goal to support entrepreneurs, start-ups, and early stage enterprises. It dedicated the first three years of its existence to development and training of MBAN team and managers. The network officially started working for BA investments on November 18th 2013.

4.2.4 Commercial Banks

The Bank system in Republic of Macedonia consists of 16 banks, 1 foreign branch office, 8 saving banks and the Macedonian Bank for development promotion (MBDP). 13 of Macedonian banks are in possession of foreign stockholders and 7 are in possession of foreign banks. The list is as follows:

1. Alfa Bank AD Skopje
2. Eurostandard Bank AD Skopje
3. Kapital Banka AD Skopje
4. Komercijalna Banka AD Skopje
5. NLB Tutunska banka AD Skopje
6. Ohridska banka AD Ohrid
7. ProCredit Bank AD Skopje
8. Stopanska Banka AD Bitola
9. Stopanska Banka AD Skopje
10. TTK Bank AD Skopje
11. Univerzalna Investiciona banka (UNI) AD Skopje
12. Halk banka AD Skopje
13. Central Cooperative Bank AD Skopje (Централна Кооперативна Банка)
14. Sparkase Bank Macedonia AD Skopje

None of the commercial banks provides credits for start-ups, and in general the conditions for receiving an investment credit are complex, mortgage or other type of collateral is a must, while the interest rates are in the range of 8-12% on annual base. These data support the findings from the survey – the access to finances for SMEs, especially finances for innovation activities, is challenging.

4.3 EU Funding Opportunities

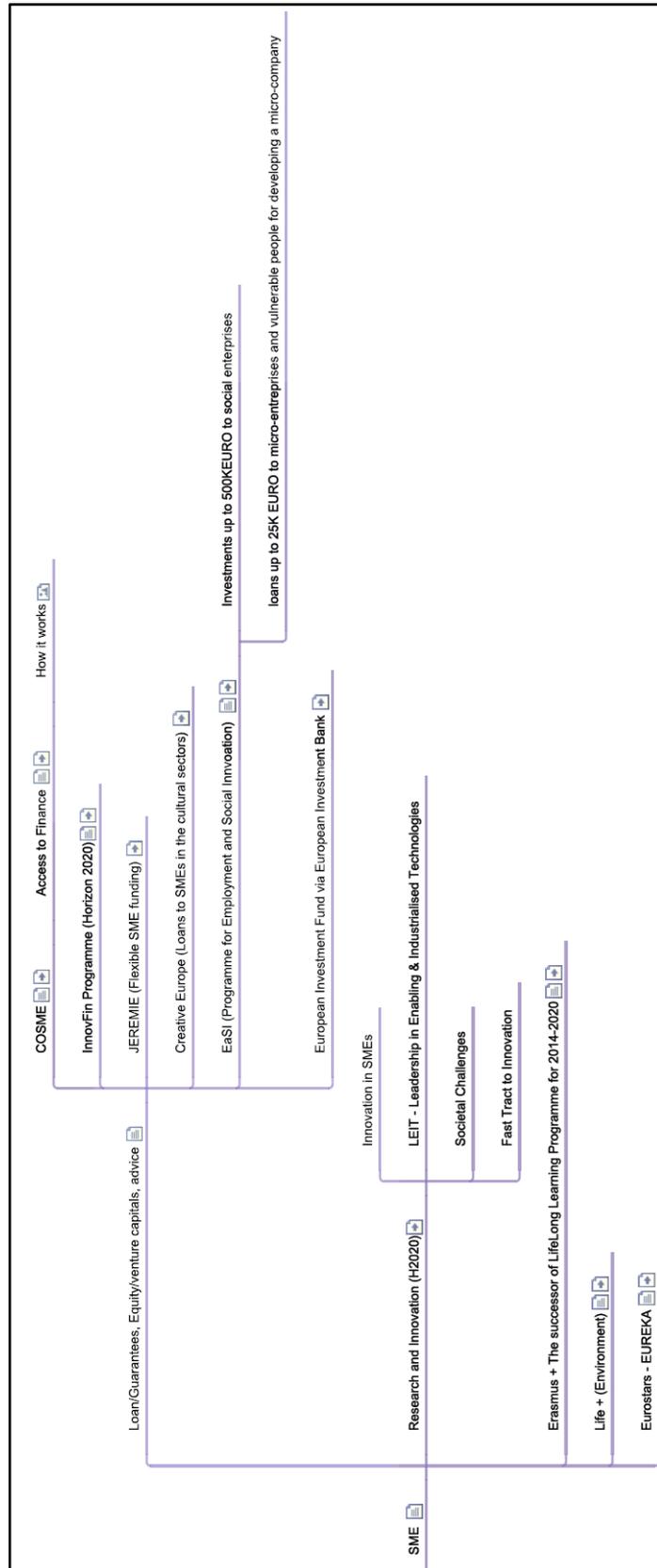
The EU offers financial opportunities for supporting Small and Medium Enterprises (SMEs) through a variety of different programmes and funds. The opportunities for which Macedonian SMEs are eligible for are provided on **Error! Reference source not found.**

The first available group of EU funds is the group of loans/guarantees, equity/venture capitals, and advices. This group of funding programmes include: COSME, InnoFit Programme (part of Horizon 2020), Creative Europe which also covers loans to SMEs in the cultural segment, EaSI – Programme for Employment and Social Innovation, and the European Investment Fund through the European Investment Bank.

Furthermore, Macedonian SMEs are eligible for funding from the Research and Innovation programmes i.e. Horizon 2020, a group of programmes supporting Innovation in SMEs, then LEIT – Leadership in Enabling and Industrialised Technologies, Societal Challenges, and Fast Tract to Innovations. Other programmes that as well fund innovation activities in SMEs through EU funds include the Erasmus+, Life + (covering Environment), and Eurostat –EUREKA.

Despite these EU funding opportunities, Macedonian SMEs interested in investing in innovative products and services, can receive funding from each of the EU member states through programs and funds for cooperation, on a bilateral level.

Figure 4-1. EU Sources of Funding for SMEs



Chapter 5 Conclusion

The results from the study Profiling Macedonia's innovation performance, portray a country with significant ambition to change the structure of its economy towards the higher value added industries and increase the in-country capacities for innovation (policies, strategies and active programs and measures).

Findings from the survey of the Macedonian companies, emphasise that 78% of the surveyed Macedonian companies in the period 2010-2013 were involved in some type of an innovation activity (product/service innovation, process innovation or organisational/marketing innovation), invested in innovations which are not yet complete, or innovation projects which have been abandoned, and/or had innovation-related expenditures. The main obstacle to introducing innovations comes from the fact that companies have difficulties with the commercialisation of their ideas. They are not aware of their innovation capacities, and how to commercialise their existing resources, platforms and knowledge. This is confirmed with the findings on the revenue structure. Almost two-thirds of their revenues come from their old products and services, around 13 percent from the products and services new to the company, while 20 percent from the products new to the market.

Another significant challenge arises from the lack of finances, or more probably the lack of information for the financial sources available to companies in Macedonia. Our research identifies and explores a multitude of relevant source of finances for companies in the country and the EU; thus, availability of finances should not be a significant challenge, especially for the established SMEs. More than half of the surveyed companies abandoned their innovation projects, mainly because of the uncertainty of the markets, the strong competition, the lack of suitable partners, and the finances.

In general, and despite the fact that more than half of the surveyed companies tend to use closed innovation models, one may argue that there is a balance in the open and closed innovations approach, where the dominant information source is a combination of internal and market sources (clients, suppliers and competitors – direct spillovers). Unfortunately, the cooperation with Universities and Research centres is assessed as low. In general the findings on the infrastructures of support for innovation in the country –infer challenges with the efficiency of the research centres in ownership of the government and the public sector, as the expenditure of both are lower compared to the revenues. The same is a product of the lack of commercialisation of the research results and confirm the findings from the study for the existence of a challenging cooperation of the HE and government research centres with the businesses.

Despite numbers and initiatives, clusters have still not reached the required efficiency for improving the sophistication of the business processes, while numbers on the activity of FDIs in the country indicate a low spillover effect to the local companies, absence of a more serious technology transfer, and insignificant impact on the innovation capacity of the Macedonian economy. Nonetheless, having in mind the current stage of entry for majority of the MNEs, it is quite possible that the current situation is temporary, and that the spillover will intensify in the future.

References and Bibliography

1. Bonabeau, E. et.al, (2008). A More Rational Approach to New-Product Development. *Harvard Business Review*, 86(3), 96-102.
2. Cassiman, B., and Veugelers, R. (2006). In search of complementarity in innovation strategy: Internal R&D and external knowledge acquisition. *Management Science*, 52(1), 68–82.
3. Chesbrough, H. (2006). *Open business models: How to thrive in the new innovation landscape*. Boston: Harvard Business School Press.
4. Cohen, W. M., and Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), pp: 128–152.
5. EBRD (2015). Official website. Available from: <http://www.ebrd.com/home> [Accessed on: 29.01.2015]
6. EMKICE (2015). Official website. Available from: <http://emkice.com/mban/> [Accessed on: 30.01.2015]
7. Grönlund, J. et.al. (2010). Open Innovation and the Stage-Gate Process: A Revised Model for New Product Development. *California Management Review*, 52(3), 106-131.
8. Herzog, P. (2010). *Open and Closed Innovation: Different Cultures for Different Strategies 2ed*. Heidelberg: Springer.
9. Herzog, P. (2010). *Open and Closed Innovation: Different Cultures for Different Strategies 2ed.*, Heidelberg: Gabler Verlag.
10. Kaafarani, B., and Stevenson, J. (2011). Breaking Away: an Innovation Model for Sustainable Growth. *Research Technology Management*, 54(3), 44-51.
11. Lichtenthaler, U. (2008). Open innovation in practice: An analysis of strategic approaches to technology transactions. *IEEE Transactions on Engineering Management*, 55(1), pp: 148–157.
12. Lichtenthaler, U. (2011). Open Innovation: Past Research, Current Debates, and Future Directions. *Academy of Management Perspectives*, 25(1), 75-93.
13. MBDP (2015). Official website. Available from: <http://www.mbdp.com.mk/index.php/en/> [Accessed on: 30.01.2015]
14. Rubera, G., and Kirca, A. (2012). Firm Innovativeness and Its Performance Outcomes: A Meta-Analytic Review and Theoretical Integration. *Journal Of Marketing*, 76(3), 130-147.
15. Seecel (2012-2020). Innovation Strategy of the Republic of Macedonia for 2012-2020 Official website. Available from: <http://www.seecel.hr/UserDocsImages/Documents/InnovationStrategy%20EN%20version.pdf> [Accessed on: 27.01.2015]
16. Shavinina, L.V. (2003). *The international handbook on innovation*. Elsevier.
17. Stamm, B.V. (2008). *Managing innovation, design and creativity*. John Wiley and Sons.

18. State Statistical Office (2014). Innovative business entities in the period 2010-2012. Official website. Available from: <http://www.stat.gov.mk/pdf/2014/2.1.14.25.pdf> [Accessed on: 27.01.2015]
19. State Statistical Office (2015). Statistical review: Population and Social Statistics. Official website. Available from: <http://www.stat.gov.mk/Publikacii/2.4.15.02.pdf> [Accessed on: 27.01.2015]
20. State Statistical Office Republic of Macedonia (2015). Official website. Available from: http://www.stat.gov.mk/Default_en.aspx [Accessed on: 27.01.2015]
21. The World Factbook (2015). Europe: Macedonia. Official website. Available from: <https://www.cia.gov/library/publications/the-world-factbook/geos/mk.html> [Accessed on: 27.01.2015].
22. Trott, P. (2008) *Innovation management and new product development*, FT: Prentice Hall.
23. Trott, P., and Hartmann, D. (2009). Why “open innovation” is old wine in new bottles. *International Journal of Innovation Management*, 13(4), 715–736.
24. Urabe, K. et.al.(1988) *Innovation and management: international comparisons*, New York: Walter de Gruyter.
25. World Economic Forum (2014). The Global Competitiveness Report 2014–2015. Official website. Available from: http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf [Accessed on: 27.01.2015].
26. Barro, R. J. and Sala-i-Martin, X. (1995) *Economic growth*. New York: McGraw-Hill.
27. Batra, G. and Tan, H. (2002) Building competitive firms: Incentives and capabilities. *In:*
28. NABI and M. LUTHRIA (eds.), World Bank, Washington, D.C.
29. Romer, P.M. (1986) Increasing returns and long-run growth. *Journal of Political Economy*,
30. 94 (10), p.1002–35.
31. WorldBank Database (2015). World Development Indicators. Available from: [Accessed on: 27.01.2015].

Appendix – Profile of Surveyed Companies

Figure 0-1 Changes of the revenue in the period 2010-2013

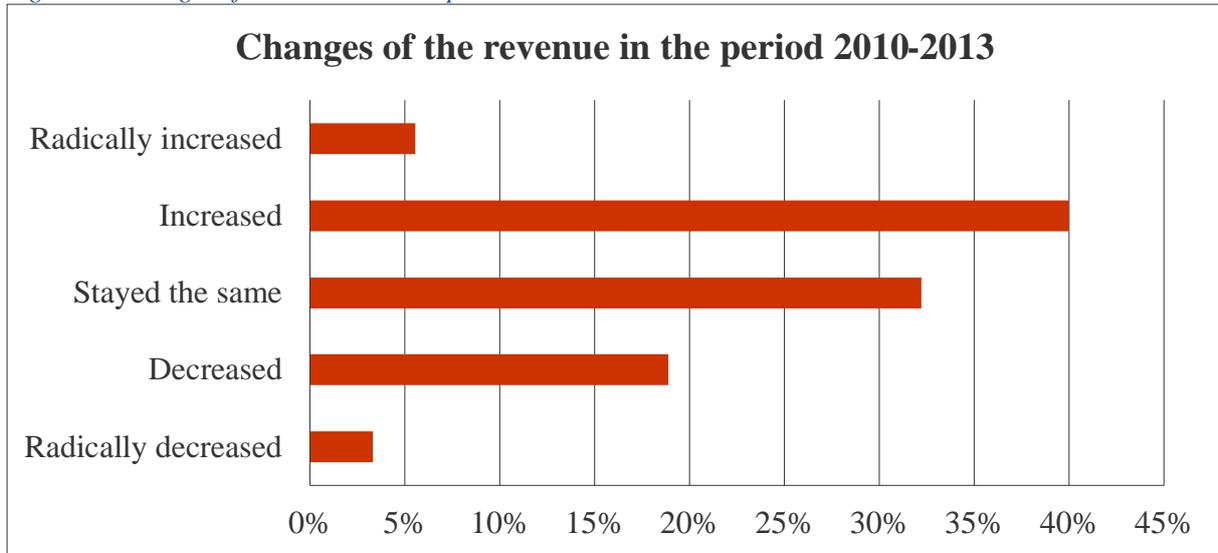


Figure 0-2 Total number of employees in 2013

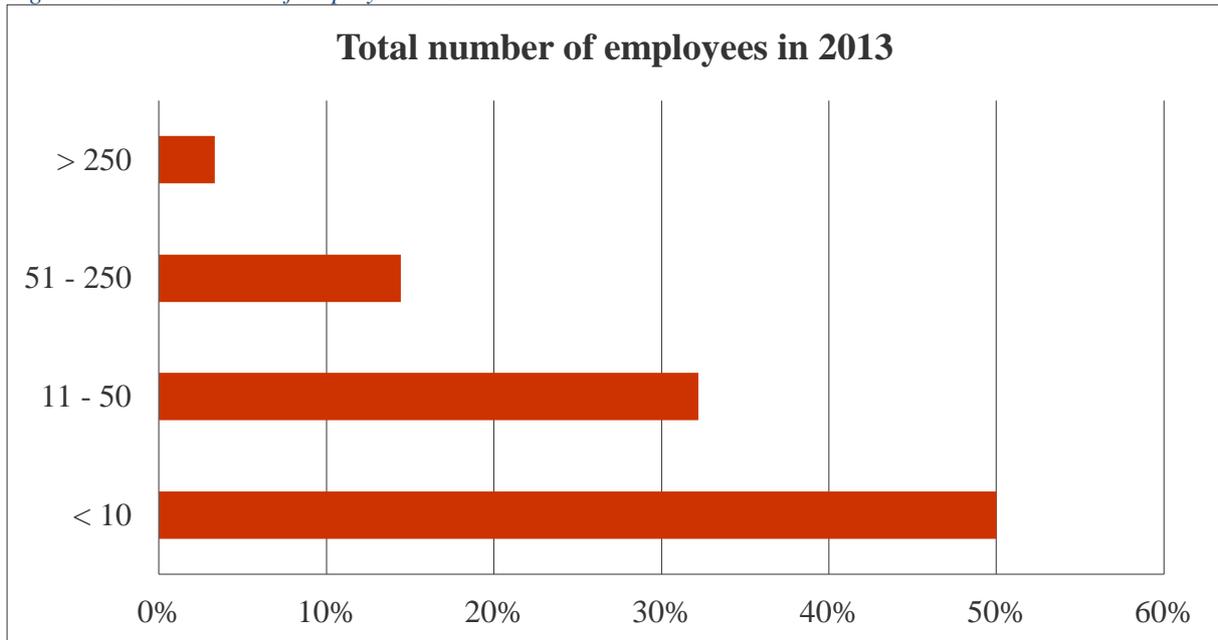
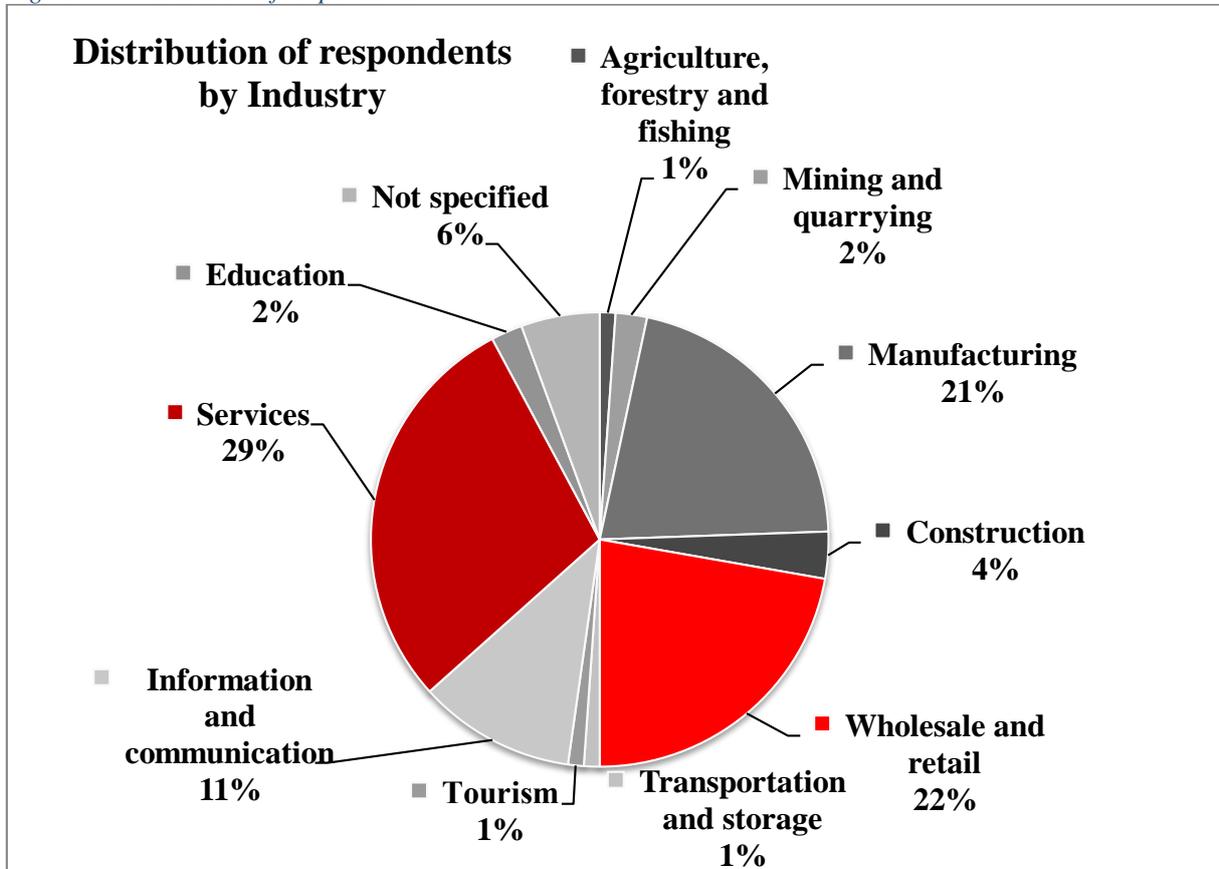


Figure 0-3 Distribution of respondents





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