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Analyzing the Process of Patent Submission with a Special Emphasis on the Phases of the Research Process – the Case of Slovenia

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This article presents some findings about the process of patenting of Slovenian and foreign researchers in scientific research. Based on the reviewed literature and with help of our conceptual model, we establish that the patenting process can be divided into three separate phases: knowledge detection phase, knowledge dissemination phase and knowledge transfer phase. During the process of researching and patenting, a variety of factors affect the results, which can be divided into two groups: internal and external factors. In Slovenia, patents are statistically significant for researchers working and exploring in the fields of natural science and engineering. Research results in the form of a patent largely depend on financial support and work experiences of individual researchers or research groups. The commercialization of a patent means a successful ending of the research process, as many positive benefits are expected.

Keywords: researchers' patenting activity and productivity, process of innovation – patenting process, patent driving forces and areas, academic entrepreneurship.

1 Introduction

The patenting activity of researchers is a relatively new topic in scientific research, with first publications of findings in the literature dating back to the late nineties. Most studies relate to American researchers and their research environment that substantially differs from the European environment in many respects (for instance, differences in software patenting (Ženko, 1999; Ženko, 2000); in Europe, conditions that determine inventiveness are set and dealt with more firmly than in USA (Bühler, 2009)). However, given the limited availability of theoretical frameworks, these findings will provide a basis for our model and hypotheses.

As the number of studies conducted in the European environment is surprisingly small, our theoretical model is in fact one of the pioneering studies of the field in Slovenia and the wider area of Europe. On the one hand, the literature that serves as our theoretical foundation and summarizes other experiences in the field is quite extensive, while on the other it is very limited. The subject of researchers' patenting activity is rather new and topical; it intertwines with studies in various subfields and thus causes discrepancies in theoretical bases. Reasons for such discrepancies lie in the wideness of the research area, which includes the following topics: forms of intellectual property rights (Davis, 2004), the patenting process (Erickson, 2003), innovation influence factors and patenting (Dai et al., 2005), relations between different actors participating in the production of new knowledge (Etzkowitz et al., 2000), the organization of institutions, transfer of knowledge to the economy (Etzkowitz, 2003; Dietz and Bozeman, 2005), forms and significance of knowledge transfer, relations between the public and private sectors and their cooperation (Geuna and Nesta, 2006; Giuri et al., 2007), and so on. Due to the newness of the subject, no research guidelines have so far been established. This explains considerable variation among starting points for examining, naming and defining individual variables, which results in confusion and brings additional issues to the research of the field.

It is a widely accepted fact that production capacities are increasingly based on the knowledge of natural science and technical knowledge. In order to obtain such knowledge, more and more companies approach faculties, universities and other public research institutes. Accordingly, the function and structure of higher education and research institutes has changed, and the latter now provide the foundation for facilitating knowledge transfer to new sources of industrial innovation and following the mentioned trends (Etzkowitz, 2003). With the purpose of gaining economic benefits that arise from patenting activities, faculties and other education institutes are focusing on the areas of intellectual property rights, the transfer of knowledge and technology to practice, licensing, incubators and academic spin-offs. In consequence, the number of academic innovations that have immediate commercial potential is on the rise. University knowledge has therefore become a new source of industrial innovation (Chang et al., 2006; Hockaday, 2009).

According to the Slovenian Intellectual Property Office, patents are "granted to natural or legal persons for any inventions which are new, involve an inventive step and are susceptible of industrial application". An invention or technical solution is considered new if it does not form part of the state of the art, that is, if it was not made available to the public by means of an oral or written description, by use, or in any other way, before the date of filing of the patent application. An invention is considered as involving an inventive step if it is not obvious to an expert skilled in the art. Finally, an invention is susceptible of industrial application if it can be produced or used in any kind of industry, including agriculture (http://www.uil-sipo.si/, 2009).

With regard to the number of scientific publications and citations per million inhabitants as measured in 2003, Slovenia ranks in the very top of developed countries with 827 publications[1] (even before USA). However, one of its major problems is the lack of applied orientation in research. The scarcity of cooperation between researchers and the lack of practice orientation are directly reflected in the number of patent applications, as the number of patent applications indicates researchers' applied orientation. With regard to the number of patents (or the ratio between the number of publications and patents), Slovenia lags far behind developed countries (MVZT[2], 2005). The 2006 European Innovation Scoreboard report provides a comparative assessment of the innovation performance of EU member states using an innovation index. It classifies Slovenia in the third category group as an average innovator, thus placing it behind two groups of countries that represent innovation leaders and innovation followers (Parvan, 2007). The key research problem and the basis for our conceptual model is discovering reasons for such classification and establishing factors that affect the number of patent applications and their commercialization.

The principal purpose of this paper is to clarify, in the broadest sense, the role of patents and the factors of influence on researchers' patenting activity, and hence provide views on and guidance for improving the situation in the field. In this way and in combination with other measures, Slovenia will reduce the gap between its own patenting activity and that of other developed countries. Solutions to this problem should be sought on a large scale. Given the complexity, interconnectedness and wide scope of potential influence factors, our approach to the analysis is of a holistic nature.

2 Developing the model and key hypotheses

Recent research has noted a change in the role of universities and institutes. In the spirit of marketing, the latter are moving towards "entrepreneurial organizations" (Dai et al., 2005). According to Etzkowitz (2003), these changes can be partially attributed to a new competitive way of funding and the adjustment (expansion) in orientations (e.g. from teaching to research universities). As a consequence, institutes are exposed to external impacts that are unrelated to the academic environment, not only in terms of decisions on publishing or patenting, but also in terms of the entire research process – from the initial idea and research to dissemination and consequent implementation of results.

2.1 Research process phases

The research process begins by generating the research idea and continues with the phase of choosing and ensuring funding. Generally, financing sources depend on the nature of the research idea. In some cases, researchers are required to adjust research ideas to the funding demands. After the provision of resources, researchers devote their time and energy to generating knowledge and obtaining final results. The last research phase is knowledge diffusion, which presents research findings to the professional public. Thus, research findings gain in reputation at universities and in the wider society.

The decision on diffusing research findings relates to the form the scientist chooses for the presentation of research findings. The diverse options include various publications, lectures, appearances, presentations at conferences, business secrets, reports, demonstration projects and, last but not least, patents. Moreover, researchers can use different combinations of these methods simultaneously. The objective of diffusion involves maintaining the freedom of future actions, enhancing academic reputation, transferring science to society or obtaining future funding (Owen-Smith and Powell, 2001).

In order to illustrate theoretical findings more easily, a theoretical framework, i.e. **a conceptual model**, was designed based on the reviewed literature to serve the purpose of analysis and interpretation of factors that affect the number of patent applications. The model of societal influences on the research process developed by Dai et al. (2005) was used as a starting point and partially adapted (Figure 1). Since the chain encompasses numerous factors that impede or motivate researchers, from knowledge detection and dissemination to the application of newly created knowledge, factors must be divided into individual phases and differentiated according to their origin. Therefore, three phases were identified: knowledge detection phase, knowledge dissemination phase and knowledge transfer or application phase.

[1] The data on 827 publications per million inhabitants pertains to original scientific articles published in local and international journals in 2003 and does not include papers presented at local or international conferences (MVZT, 2005).
[2] Ministry of Higher Education, Science and Technology (Ministrstvo za visoko šolstvo, znanost in tehnologijo).

Hypothesis 1: The patenting process can be divided into three phases: knowledge detection phase, dissemination phase and knowledge transfer/application phase.

2.2 Importance of the research area

Morgan et al. (2001) performed a study on the patenting activity of U.S. researchers in the education and industry sectors. A typical week of the examined group included working in one or more technological areas. The patenting activity of researchers employed in biotechnology in the education sector amounted to 41.8%, a considerably greater share than that of the next area, sensor and signal processing with 23.2%. A noticeably different order was noted in the industry sector: advance materials were on the top, followed by microelectronics and semiprocessors, and sensor and signal processing, whereas biotechnology was only fifth, hence indicating a significant difference between patenting activities in the education sector and industry.

Conducted in six European Union countries, the 2003 European Patent Value survey (PatVal-EU) covered the most typical areas for patenting activity, as follows: the fields of Electrical engineering, Instruments, Chemicals and Pharmaceuticals, Process engineering and Mechanical engineering (Giuri et al., 2007). Furthermore, the Dietz and Bozeman study (2005) highlighted the research area as a statistically significant influence factor on patent productivity of U.S. scientists. Especially high patent rates were observed in relation to researchers from the fields of physics, mathematics, and engineering (chemical and electrical engineers). Among engineers, civil engineers had the lowest patent rates,

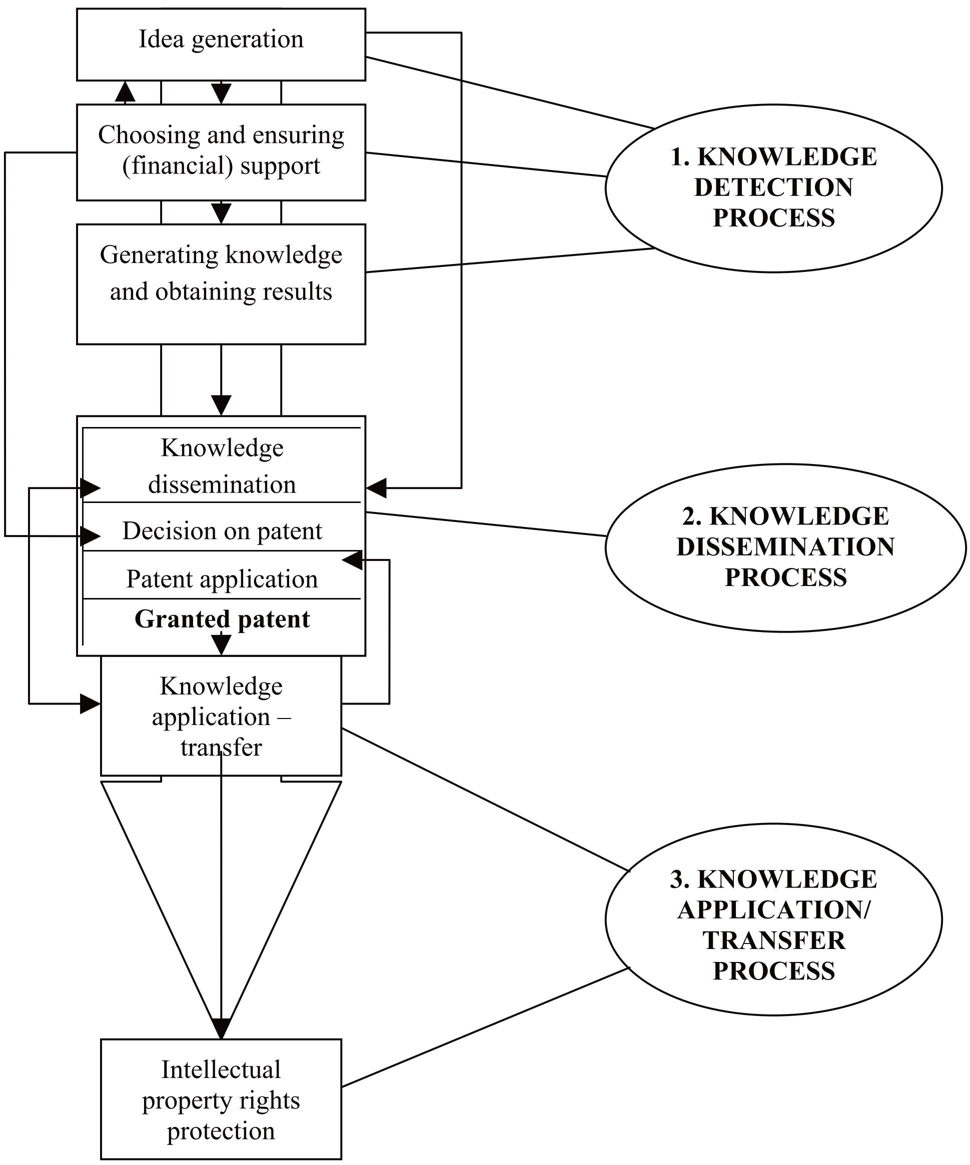

Figure 1:The conceptual theoretical model of researchers' patenting activity (by phases). Source: Own adaptation based on Dai et al. (2005).

while the lowest patent rates in researchers were attributed to biologists.

When comparing these findings to data on Slovenian researchers with at least one registered patent (Table 1), it can be established that the highest total number of patents is held by researchers in engineering (987), followed by natural and mathematical sciences (with 234 patents), biotechnical (69 patents) and medical sciences (34 patents), while other sciences add a total of 8 published patents (Cobiss, 2006). A similarly abnormal distribution is evident in terms of patenting productivity. Slovenian researchers are most productive in natural and mathematical sciences (each researcher has an average of 3.33 patents) and medical sciences (an average of 3.03 patents per researcher). Surprisingly, engineering does not follow until the third place, with researchers holding 2.32 patents on average. The SIPO (Slovenian Intellectual Property Office) runs a database of all applied for and granted patents in the Republic of Slovenia with many details about patents and data about inventors, applicants and owners of patent rights. When reviewing the database, it was also discovered that 54 cases over a period of 8 years (from 2000 to 2008) listed a university or its faculty member as a patent owner. Therefore, 54 patents that were entered in the database during the mentioned period are owned either by the University of Ljubljana or by the University of Maribor. Since most patent owners are the faculties of natural sciences and engineering, such as the faculty of mechanical engineering, the faculty of pharmacy, the faculty of electrical engineering, etc., it follows that in Slovenia, the research area is strongly linked with options for obtaining a patent.

There are many differences in how Slovenian universities regulate patent ownership and patent rights obtained during employment at the university. The only university with a related legal order is the University of Ljubljana, which has laid down the Rules on the Adoption of Innovations and Inventions. The University of Maribor refers to the rights specified in the Employment Related Industrial Property Rights Act, whereas the University of Primorska presently uses no regulation that would clearly define intellectual property or patent and invention rights obtained during employment.

Result interpretation should devote special attention to the productivity of researchers, as the latter varies considerably. The studies on the careers of researchers are founded on questions related to uneven (skewed) distribution of their productivity in the population of academic researchers (Dietz and Bozeman, 2005). As early as in 1928, Alfred Lotka noted that a minority of the population of researchers produces the majority of published scientific work. What is thus the reason why most authors produce only a few papers throughout their entire careers, while others manage to publish more than 600 articles? Based on the above, it can be presupposed that:

Hypothesis 2: The research area is a strong influence factor on researchers' patenting activity.

There is a number of factors that affect the knowledge diffusion decision in different ways throughout the entire research process. Firstly, the **choice of a research idea** itself **can prove to be crucial for future applied knowledge value**, as basic research generally leads to publication in scientific journals or conference demonstration papers, whereas the findings of application projects tend to be disseminated through patents, trademarks or other forms of commercial use. Secondly, **the manner of research funding** can have a great impact on knowledge value. The presentation of publicly funded research findings requires project reports or scientific articles as final products (Dai et al., 2005). In addition, the nature of research,

Table 1: Patenting activity of Slovenian researchers with at least one patent registered at the Slovenian Research Agency (ARRS) on 29/09/2006, by science. Source: Internal source COBISS, 2006.

SCIENCE	NUMBER OF RESEARCHERS	NUMBER OF PATENTS*	CURRENT APPLICATION NUMBER	RESEARCHER PRODUCTIVITY**
Natural and mathematical sciences	234	779	451	3.33
Engineering	426	987	443	2.32
Medical sciences	34	103	31	3.03
Biotechnical sciences	69	185	81	2.68
Social sciences	6	11	0	1.83
Humanities	0	0	0	0.00
Interdisciplinary research	0	0	0	0.00
Not allocated	2	3	0	1.5
TOTAL	**771**	**2068**	**1007**	**2.68**

Notes:
** patent classification and database run by the ARRS does not include information on European or Slovenian patents*
*** The productivity of researchers = number of patents / number of researchers*
**** The number of patents is larger than the number of applications, as the same patent is entered in the Cobiss database by more researchers who participated in patent creation. The applicant is usually only one, which explains the smaller number of applications.*

whether basic or applied, can affect the research outcome. In most cases, basic research derives from an interest of an individual researcher who is motivated by a “sacred spark” (Cole, Cole, 1973) and centres primarily on basic theoretical knowledge rather than on commercial applications. While basic research has always been typical of the academic sector, applied research has gained considerable importance in university research since 1970. The American National Research Foundation (1996) defines applied research as “research aimed at gaining knowledge or understanding to determine the means by which a specific, recognized need may be met”. Solutions can come in the form of patents, trademarks, industry reports or demonstration projects.

Decisions on how to disseminate scientific research findings are much more complex than it may appear. Normally, patenting decisions are not reached at scientific research institutes. Similarly as in basic research, many researchers engaged in applied research use scientific publications as the main research output due to academic inertia. Even if they decide in favour of patenting, it is highly unlikely that this decision will be made at the beginning of the research process. Nonetheless, many research institutes do decide to patent their researchers’ inventions in the final phase, and the fact remains that the number of patents is growing. In USA, the number of successful patent applications has increased from 517 in 1980 to 3289 in 1995 (Morgan et al., 2001). Furthermore, growth can also be observed in Slovenia (Table 2), where 53 patents were granted in 2001 and 69 in 2005. The total number of granted patents from 2001 to 2005 was 328. Although the number fluctuates, an upward trend is generally evident.

Regardless of the fact that the final decision on knowledge research and dissemination remains in the hands of researchers at universities and public research institutes (in terms of publications or patents), studies have shown (Dai et al., 2005) that researchers’ decisions are affected both by characteristics of the university environment and the wider society, as well as by policies. Therefore, it can be established that patenting activity is indirectly or directly influenced by two main groups of factors: **internal** at the level of the researcher and **external** at the level of universities and the level of the wider environment (country). These factor influences play a role in all phases of the research and application process. Moreover, patenting activity also depends on the research area itself.

Hypothesis 3a: The factors in the research and patenting process can be divided into internal and external factors.

Hypothesis 3b: Internal factors on the personal level of researchers do not remain the same throughout the entire patenting process, but differ according to individual research process phases.

2.3 Diverse work experience and knowledge spillover

The majority of existing literature addresses the activity and development of researchers in the academia and researchers (engineers) in the industry separately (Dietz and Bozeman, 2005). In truth, researchers change jobs (or their primarily employer) frequently, either moving between the academic sphere, government and industry as full-time employees or working in several sectors at the same time. From the marketing perspective, economists (Jaffe et al., 1993) have termed the transfer of knowledge from one company to another as knowledge spillover. In neoclassical economic theory, spillovers are regarded as inefficient market performance, since the carriers of knowledge are believed to have difficulties retaining the benefits and content of discoveries. Nevertheless, when considered through the perspective of knowledge transfer and progress, spillovers are often perceived as effective. The human and social capital that a researcher carries from one job to another, and perhaps even from one sector to another, can provide constant knowledge for progress in solving new problems. The transfer of people from one organization to another, for instance, from industry to academia and vice versa, represents a foundation for knowledge transfer across organizations (Rogers, 1995). In this way, different knowledge networks are created and maintained throughout individual careers. With diverse work experience, both scientists and engineers can develop a closer network of personal contacts, which results in increased human and social capital and consequently lead to improved skills. These social networks thus enhance their access to people with key knowledge.

In relation to that, a study conducted by Morgan et al. (2001) among U.S. scientists and engineers (S&Es) confirmed that in the education sector, the patenting activity rate is somewhat higher for those with second jobs in the economy (5.7%) than for those without second jobs (4.3%). In contrast, patenting activity in the industry sector was lower for those with second jobs (8.7%) than for those without (10.2%). While second jobs of academics, such as consulting or involvement in start-ups and academic spin-offs, are likely to indicate their involvement in patenting activity, the S&Es working in the industry sector generally patent as an integral part of their primary jobs.

A similar study (Dietz and Bozeman, 2005) was performed among 1200 U.S. scientists and engineers (S&Es)

Table 2: Patenting activity of Slovenian researchers registered at the ARRS by year. Source: COBISS, 2006.

PATENTING ACTIVITY	2001	2002	2003	2004	2005	TOTAL
Patent applications*	19	38	29	33	44	163
Granted patents	53	47	79	80	69	328

**The number of granted patents is incomparably larger than the number of patent applications, as the Cobiss database enables duplicated patent applications with several researchers being able to claim the same patent.*

employed at faculties, government institutions and in the industry. Examining influence factors on the number of registered patents and scientific publications, the study revealed a strong statistically significant relationship between patent productivity and the number of years spent by S&Es in the industry. Each added percent of employment period measured in years spent by S&Es in the industry increased their average number of patents by 0.83 per year (while other variables remained constant). Drawing on these findings, it is expected that the frequency of scientists' involvement in the economy and their work experience in the economy will prove as two of the more significant influence factors on patenting activity.

Hypothesis 4: Diverse work experience of a researcher has a positive effect on his productivity and consequently on patenting activity.

2.4 Funding and the financial perspective

A changed manner of research funding is another factor that has sometimes led to changes in researchers' legal status with regard to transitioning between the academia and practice. For instance, French researchers have the option of spending a part of their working time in industry (Llerena et al., 2003, cited in Geuna and Nesta, 2006). This promotes the transfer of technology into practice and brings them further rewards. Moreover, up until 2002 German university researchers enjoyed the so-called professor's privilege that gave them complete ownership of university inventions while all innovation development costs were transferred to government (Czarnitzki et al., 2009). However, since the 2002 legislation changes, universities hold innovation ownership rights and researchers themselves bear part of the costs for innovation patenting (Kilger and Bartenbach, 2002, cited in Czarnitzki et al., 2009). Therefore, it can be presupposed that:

Hypothesis 5: The larger the share of own funding of patent applications by researchers, the lower their patenting activity.

Stephan and Levin (1992) attempted to integrate the work of various research traditions in order to establish findings about the effects on researchers' productivity. Useful value was emphasized as a major factor in productivity. According to their opinion, scientific problem solving is motivated by external rewards of recognition and prestige among researchers' peers as well as by gaining internal satisfaction. Stephan and Levin (1992) thus propose three groups of research productivity motivators (in terms of publications and patents) that are intertwined with age of researchers throughout their careers: a researcher's intrinsic satisfaction derived from scientific discovery, peer recognition and financial reward. The authors argue that these three motivators represent internal incentives for researchers, as such reward system motivates them to behave in socially positive ways. Consequently, researchers invest in their productivity only up to the point where further investments still prove to be profitable.

Before disclosing their inventions, researchers take account of the perspective of minimizing transaction costs, considering the potential benefits and costs of invention disclosure in the patent office of their institution (Chang et al., 2006). Tangible benefits of potential patents are reflected in the share of licensing income from royalties, whereas intangible benefits of granted patents can affect a researcher's career and future project application success. On the other hand, tangible costs are caused by the patent application and its maintenance, whereas intangible costs are evident in the time researchers must invest in updating and improving patents, which distracts them from their primary research.

It then follows that researchers behave rationally and optimize their time and resources so as to obtain greater benefits. Undoubtedly, monetary reward is regarded as one of the more significant benefits, i.e. financial benefits that stem from their work on registered patents. In their study on U.S. institutions and researchers, Lach and Schankerman (2003) discovered a positive and significant relationship between academic research and monetary reward for achievement. This implies that designing intellectual property rights in academic institutions has real impacts on the economic growth and productivity. The authors also found that the response to financial incentives is much stronger in private than in public universities.

Similar findings were reported by other scientists (Morgan et al., 2001). American researchers who were active in patenting earned more money with primary jobs and from all other sources than those who were not active. The income gap between those with patenting activity and those without was larger in the education sector than in industry, indicating that, on average, the S&Es in the education sector received higher premiums outside their primary jobs. In education, financial rewards for patenting activities complemented primary salaries of S&Es more than they did in industry, where researchers are expected to patent as a part of their primary duties. Furthermore, in the education sector, a relatively large difference between the average number of weekly working hours was also found between those with patenting activity and those without. The S&Es who were active in patenting worked an average of 51 hours per week in their primary job, whereas those who were not active worked an average of 45 hours per week. Drawing on these findings, it is expected that:

Hypothesis 6a: The financial motive is one of the highly significant motivators of researchers' patenting activity.

Hypothesis 6b: A successful commercialization of patents by researchers has a positive influence on their further patenting activity.

2.5 Review of previously established hypotheses and own findings

Figure 2, which is presented below, uses a diagram to summarize the hypotheses put forward in the paper and illustrate the groups of factors and other influences that play an important role in researchers' patenting activity. The first influence group includes internal factors that derive from the inside and are an integral part of researchers' behavioural nature. This mainly

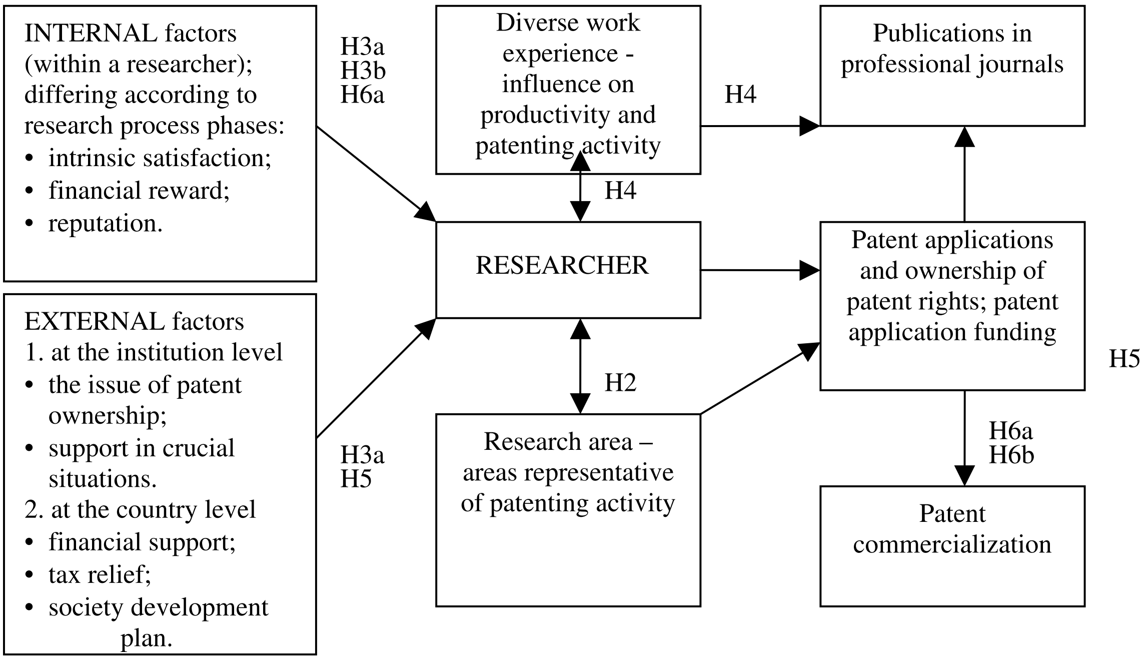

Figure 2: The influence of various factors on researchers' patenting activity. Source: Own conceptualization, 2009.

concerns the obstacles and motives facilitating or preventing increased patenting activity. The second significant group comprises external factors that arise from the environment, either in terms of institutions where researchers are employed or in terms of the country in which they operate. The research area is the next important factor of patenting activity, as some areas are statistically more patent productive than others. This indicates that there is a higher probability for patent creation in the areas that have already been characterized by greater patenting activity in the past, such as natural science and engineering. Furthermore, the researcher's work experience with different business and economic agents is essential for two important processes, namely knowledge diffusion and knowledge transfer. Such mode of operation enables researchers to gain more financial support and enhance work productivity. The entire research and discovery process ends with a patent application. In the final phase, the principal indicator of patenting activity is the number of patent applications by a researcher or research group. If the patent is not commercialized and no consequent transfer of knowledge into practice occurs, the entire research process either serves itself or its purpose hides somewhere else, for example, in the goal of publishing in research journals. To sum up, the path from idea to patent and its use in practice is long and exhaustive, and therefore inevitably requires the participation of different entities in the research process.

3 Discussion and conclusion

Understanding why some researchers are more active in patenting and applied research than others represents a foundation on which opportunities for growth and development of a society/country, in our case Slovenia, can be explored. The model (Figure 1) developed for the field of researchers' patenting activity serves as a basis for understanding the patenting process from the research idea to potential commercialization of generated and protected knowledge – in this case through a patent. Geuna and Nesta (2006) grouped positive consequences of academic patenting in a few common aspects that function as a set of expectations and assumptions, but are, unfortunately, presented without appropriate scientific and statistical support due to the newness of the field. Nevertheless, the expected positive effects of university patenting (and hence researchers' patenting activities) are: increased number of financial resources (as a result of increased licensing and royalties) available without limitations or control, possibly to develop new research areas or teaching opportunities; increased funding of contract research for further development of intellectual property rights into a final product; establishment of academic spin-off companies that are partially owned by universities; and faster commercialization of new inventions, which represents a benefit for the entire society and the institution that owns patented knowledge or intellectual property.

The schematic illustration of various influence factors (Figure 2) can be used to explain the past and current state of affairs in the field of patenting activity by analyzing and investigating certain issues in each phase of the patenting process (Figure 1) and providing solutions for further action. Moreover, we encourage all researchers to do additional research in the field of the patenting activity of Slovenian researchers by employing our conceptual model (Figure 1) or the influence factor diagram, and thus obtain findings and offer recommendations for regulating the policy of patenting and patenting promotion in Slovenia. It is vital that incentives are provided in the phase of research idea generation, as this can direct the society as a whole towards creating new knowledge.

In conclusion, Figure 2 serves as a basis for further theoretical development as well as for different empirical studies in the field of academic patenting activity. Similarly, the presented model of the patenting process and patenting activity by phases (Figure 1) can also provide a basis for further research. Being aware of limitations and options for upgrading the model, we are devoted to monitoring and studying the development of researchers' patenting activity abroad in order to create favourable conditions in Slovenia, foster a climate that will contribute to enhanced patenting activity of Slovenian researchers, and hence facilitate the development of the intellectual and economic sphere founded primarily on own knowledge and development. The knowledge society has never been as close as it is today.

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Analiza procesa patentiranja s poudarkom na fazah raziskovalnega procesa - primer Slovenije

Članek predstavlja ugotovitve glede procesa patentiranja slovenskih in tujih raziskovalcev v znanstveno-raziskovalni sferi. Na podlagi pregledane literature in s pomočjo modela ugotavljamo, da lahko proces patentiranja razdelimo v tri ločene faze, in sicer fazo odkrivanja znanja, fazo diseminacije znanja in fazo aplikacije/prenosa znanja. Na proces raziskovanja in posledično na patentiranje vplivajo različni dejavniki, ki smo jih razdelili na notranje in zunanje. V Sloveniji so patenti statistično značilni za tiste raziskovalce, ki izhajajo oziroma raziskujejo na naravoslovno-tehničnem področju. Rezultati raziskovanj v obliki patenta so v veliki meri odvisni od finančne podpore in delovnih izkušenj, tako posameznega raziskovalca, kot raziskovalne skupine. Komercializacija patenta je uspešen zaključek raziskovanj, od katere se pričakuje številne pozitivne koristi.

Ključne besede: patentna aktivnost raziskovalcev, proces inoviranja - faze patentiranja, produktivnost raziskovalcev, dejavniki in področja patentiranja, akademsko podjetništvo.