
Review of the IPR System

Usage, framework conditions and support available for key actor groups of the Czech innovation system

Annex 4 to the Second Interim Report

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Table of Contents

Introduction	3
1. IPR briefs	4
1.1 Instruments of the IPR system	4
1.2 To patent or not to patent? – The case for IP management	6
2. Take-up and usage of IPR by Czech actors of the innovation system	7
2.1 IPR usage in the Czech Republic – statistical data	7
2.2 IPR usage specifics – relevance and barriers for industry	17
2.3 IPR usage specifics – relevance and barriers for academia, with a focus on patenting	26
3. The institutional set-up in the field of IPR	37
3.1 Legislative framework	37
3.2 Institutions and IPR service providers in place	39
3.3 IPR support services in other countries	42
3.4 Assessment of the level of support provided to key actors of the Czech innovation system	47
4. Overall conclusions and recommendations	52
References	55

Table of Figures

Figure 1 Patent applications of domestic applicants to the IP office of the Czech Republic, by type of applicant, 1997 to 2009	8
Figure 2 Patent applications at the EPO where the country of residence for the first named applicant is the Czech Republic, 2000 to 2009	9
Figure 3 Patent applications at the EPO by country of residence of the first named applicant, per mio inhabitants of nine selected countries	11
Figure 4 Patent applications at the EPO by country of residence of the inventor, per mio inhabitants of nine selected countries	14
Figure 5 Patent applications to the EPO by applicants from the Czech Republic, by type of applicant, 2006	14
Figure 6 Utility models of domestic applicants valid on the Czech territory according to year of registration, by type of applicant, absolute numbers.....	15
Figure 7 Number of registered designs registered nationally with the Czech IPO, by origin of applicants.....	16

Figure 8 Number of registrations of Community Designs (CDs) of Czech origin, 2004 to 2010	16
Figure 9 Relevance of different IP protection/appropriation instruments for sampled Czech firms *)	18
Figure 10 Relevance of different IP protection/appropriation instruments for sampled Czech firms by patent and non-patenting firms *)	19
Figure 11 Barriers to higher usage of IPR, as seen by respondents in the industry survey *)	21
Figure 12 Barriers to higher usage of IPR, as seen by respondents in the industry survey by patenting and non-patenting firms*)	22
Figure 13 Investigation of the market potential of new incoming project proposals at Imperial Innovations	29
Figure 14 Share of researchers in % for which patenting is a relevant activity in their research group, by research discipline	33
Figure 15 Level of agreement with statements referring to technology transfer, deans and researchers for whom patenting is a relevant activity *)	35
Figure 16 Barriers for higher usage of patents as seen by researchers, by relevance of patenting activity	36
Figure 17 Major pieces of national IPR legislation in force in the Czech Republic, as of January 2011	38
Figure 18 Search services offered by the Czech Industrial Property Office	40
Figure 19 Patent libraries in the Czech Republic	41
Figure 20 Generic elements of good practice in IPR service provision to SMEs, non-exhaustive, as identified in past studies	45
Figure 21 Frequency of usage of different types of service providers for IPR problems by industry *)	47
Figure 22 Frequency of usage of different types of service providers for IPR problems by patenting and non-patenting firms *)	48

Introduction

As part of the Audit, this report addresses the topic of Intellectual Property Rights (IPR) in the Czech Republic. In the ‘technical’ terms of our study proposal, the report presents the results of the work package on ‘protection of intellectual property and other intellectual rights’ (WP d, iii). Accordingly, this chapter provides an overview and an assessment of key elements of what can be considered to constitute main elements of an IPR system: Legislation adopted on the topic of IPR, usage and up-take of IPR by Czech industry and the scientific system and key policies, institutions and programmes/services in place to secure and foster qualified usage of IPR.

In our analysis we combined several methodological approaches:

- ‘Analytical reasoning’, mainly based on the experience of the experts involved in the project team as well as a thorough document analysis of both the relevant Czech policy documents and the international literature about usage of IPR and IPR support policies.
- Secondary statistics on IPR up-take (from the Czech Industrial Property Office, Eurostat, the European Patent Office and other sources)
- Interviews with IP professionals and users of the IPR system (firms, universities). IP professionals in this context are mainly intermediaries or representatives of institutions specialised in IPR. Most interviewees were from the Czech Republic, but we also interviewed representatives of the World Intellectual Property Organisation (WIPO) and the European Patent Office (EPO) which liaise professionally to the Czech system.
- International comparisons were used to place the Czech Republic into an international context. The countries/international institutions chosen varied according to the IPR topic discussed.

IPR issues are in many ways horizontal in nature. They can manifest themselves in various parts and mechanics of an innovation system. Against this backdrop, IPR issues are also dealt with in other reports in the course of this Audit, too – most notably, the reports on ‘Institutional Funding and Research Evaluation’ and ‘science industry linkages’. In order to avoid overlaps and achieve complementarity, we will treat the respective topics of these reports solely from an IPR perspective.

One other peculiarity of this review is its focus on some instruments of the IPR system: While our approach is to stay as broad as possible, the context of the Audit nonetheless has led us to spotlight IPR instruments and issues which are more closely related to the output of R&D: patents, utility models, industrial designs, to a degree also copyrights and strategies related to these instruments. By contrast, the instrument of trademarks and issues such as IPR enforcement, counterfeiting or piracy receive very little attention.

1. IPR briefs

1.1 Instruments of the IPR system

1.1.1 Formal IPR instruments

We start our analysis with a brief introduction of the main instruments of the IPR system in order to set a pretext for the investigation.

The system of Intellectual Property Rights distinguishes between a number of IP rights. Four can be considered the most important:¹

- **Patents**, the probably best known IPR instrument, cover technical inventions. Against the disclosure of the technical details, the patent holder receives the right for a maximum amount of time (usually 20 years) to stop other from making, selling or using an invention for commercial purposes without permission. Patents are examined by the patent office against four patentability criteria: novelty of the inventions (the specifications must have never been made public in any way anywhere in the world before), inventive step (if compared to what is already known the invention would not be something. obvious to a skilled person in the field), it has to be capable of commercial application and, eventually, it should not fall under a list of items which are by definition not patentable. Because of the examination and registration requirements, patents are the IPR instrument with the greatest legal formality.
- **Trademarks** are badges of origin for goods or services, comprising words, names, logos, colours, sounds and/or shapes. Once registered and granted, trademarks prevent others from using the same or similar badges on the same or similar products. The aim of this IP instrument is to allow consumers for easier identification and lower search costs and secures the value (reputation) of brands. Examples of trademarks are, for example, the word and the specific logo of 'Coca Cola' or 'Skoda'. The term of protection is usually 10 years, but can be extended.
- **Registered designs** protect the appearance of the whole or part of products, including shapes, configurations and ornamentations. In order to qualify for registration, a design must be new and show individual character. An example of a design would be, for example, the specific shape of the classic Coca-Cola bottle. The term of protection is set at 25 years.
- **Copyrights** protect the way ideas are expressed in so-called 'works'. Works can be, for example, literary works, music, software or video. A distinction is given to the other three instruments in that a copyright does not need to be registered. It arises automatically once it is 'fixed' in some form (e.g., on paper, in electronic files, etc.). It is thus also the least formal IP right among the formal rights. It is also important to understand that not the idea itself, but the way it is expressed is protected.²

Besides these four instruments, it seems necessary to introduce two other IP instruments: **Utility models** are something akin to patents 'light'. Also applicable to inventions, they have less stringent patentability criteria. Moreover, the patentability criteria are not examined when the models are registered.

¹ Gowers, A., *Gowers Review of Intellectual Property*, HM Treasury, London, 2006

² For example, there was a court case concerning Dan Brown's book 'The Da Vinci Code'. Dan Brown was sued for copyright infringement, but eventually cleared of the charges. While he was indeed using the same ideas and theories postulated in an earlier work by another author, he used his own specific wording and texting.

The utility model's advantage is that it is cheaper than a patent and faster to obtain. The degree of protection provided is, however, less than that of patents: It leaves it entirely up to the courts in cases of disputes to decide whether the utility model is really a new invention. Utility models are only available in selected countries, including the Czech Republic.

Last but not least, **geographic indications** protect products (mostly agricultural) which are produced in a certain region. An example is Budweiser for beer produced in the region of Budweis.

One important feature of Intellectual Property Rights is their territorial nature. While the different IPR instruments have been implemented in similar manners in countries across the world, they are usually applied for and granted by the respective national authorities. Especially when it comes to patents, there is no such thing as an 'international patent'. It is only the application procedure that is harmonised, but once granted 'international patents' are still a bundle of national patents which have to be enforced individually in each country.

An exception to the territoriality principle is the Community Trademark (CTM) and also the Community Design (CD) which provide one right valid for the whole of the EU. A Community Patent does, however, not (yet) exist.

1.1.2 Informal IP protection mechanisms

It has become common practice in a discussion on usage of IPR to also consider informal protection mechanisms and strategies, in a wider sense, as part of the IPR system and instrument portfolio.³ Though not IP rights in a classic understanding, they constitute important means of handling Intellectual Property.

There are many such informal strategies, all of which deal with the protection of information against unauthorised use. Some of these instruments merit mentioning because of the substantive role they play in practice for firms:

- **Trade secrets:** Trade secrets denote secrets or proprietary information of commercial value. Unbeknown to many, there is a small degree of legal protection present in many jurisdictions if the handling of these secrets meets certain criteria (for example, if there are adequate organisational and technical measures taken to protect the secret). The legal protection provided can be seen, for example, by the fact that industrial espionage is considered an unlawful means to unveil a trade secret. However, reverse engineering would be legal.
- **Lead-time strategies:** Lead-time strategies denote behaviour of firms which try to outpace the competition by always staying in the lead with (new) innovations.
- **Relying on the complexity of design:** This strategy is used by firms which believe that IPR protection is not necessary as it would be (too) difficult to reverse engineer the invention.
- **Defensive Publishing:** Defensive publishing denotes a strategy by which a firm decides to publish its invention and place it in the public domain instead of patenting it. That way the firm makes it impossible for competitors to reverse engineer the invention, then patent it and subsequently drive the original inventor out of the market (hence the 'defensive' character). This strategy is useful if it suffices for a company to maintain its 'freedom to operate', e.g. when applying for a patent would be too costly or its enforcement difficult.

³ Radauer, A., Ohler, F. & Streicher, J., *Benchmarking national and regional support services for SMEs in the field of intellectual and industrial property*, European Commission, 2007

1.2 To patent or not to patent? – The case for IP management

We have introduced the different formal IPR instruments and informal IP instruments also in order to address also a question that many businesses have to ask themselves: Why (or why not) should I patent my invention? There is a common belief, especially at policy level, that patenting is always good as it ‘provides protection’. Moreover, and despite of some shortcomings for usage in statistics, patents can be counted and are used as proxy for innovation performance. There is hence a belief of ‘the more, the better’.

In practice the situation is, however, subtle. A firm must contrast the benefits of patenting against the disadvantages. Both sides, advantages and disadvantages, have multiple dimensions:⁴

- The advantage side shows that patents are increasingly used not only for protective purposes (as ‘insurance premium’ so to speak), but also for other purposes such as marketing, providing a track record for investors (venture capitalists), for direct income generation through licensing or for strategic purposes (such as scaring potential competitors of).
- The disadvantages are not only costs (such as costs for application/maintenance, but also for enforcement). They are also given through the generic characteristics of patents, namely, the fact that patents are only valid for a maximum of 20 years (after which they enter the public domain) and that the particulars of the invention are disclosed in the patent, also to unlawful copiers.

In some instances, it might prove even detrimental for a company to apply for a patent: This is especially true for many inventions related to processes which are hard to reverse engineer (this would often necessitate a visit to production facilities by competitors). The ‘relying on complexity of design’ strategy is here often the better choice. Other patents constitute only sunk costs: It is a well established fact that the commercial value of patents is skewed, with a small share of patents accounting for the vast majority of monetary value.

Perhaps one of the best illustrative examples is Coca Cola. Provided that the recipe for its main beverage was patentable, it was (and is) better for the company to use a trade secret instead of a patent, and in addition draw on strong trademark protection. Having applied for a patent would have meant that all competitors would have been allowed to rightfully copy the beverage after 20 years, and they would have obtained the recipe free of charge in the patent specifications.

The Coca-Cola example shows also that is the interaction of different IPR instruments (both formal and informal tools) that has become increasingly key for successful commercialisation of R&D results. Other cases in point are, for example, Apple’s iPod/iPhone products, where copyright, patent, trademark and design protection interact with each other uniquely; or Nespresso’s coffee capsule system with its combination of patent capsule technology, design and marketing activities. All these examples show that the various formal and informal instruments can be used as building blocks for defining new business models.

In this context, it is clear that the management of these instruments (IP management) is coming more and more into the focus of activities at the executive level. IP management is not a subject for an isolated specialist department trained only on protective uses alone.

Of course, there are differences across technology fields or industries. Some industries are more prone to patenting (such as pharmaceuticals), while for other IPR does not

⁴ Radauer, A., Ohler, F. & Streicher, J., *Benchmarking national and regional support services for SMEs in the field of intellectual and industrial property*, European Commission, 2007

play an important role at all. The bottom-line is, however, to illustrate first that counting of IPR filings is not sufficient to assess innovative performance, especially in the sense of commercialisation success. It is the specific usage of the IPR, its commercial value, which counts. And, secondly, that IPR is a topic to be treated at management level with full consideration of the whole portfolio of formal and informal protection mechanisms.

We will revert to these conclusions in various parts of the report when analysing the results of our investigations.

2. Take-up and usage of IPR by Czech actors of the innovation system

2.1 IPR usage in the Czech Republic – statistical data

2.1.1 Overview

In the following chapter, we present statistics on the usage of formal IPR (patents, utility models and industrial designs) in the Czech Republic. As data sources, we used i) data from the Industrial Property Office (IPO) of the Czech Republic. This data is (also) published by the Statistical Office of the Czech Republic. Furthermore, we enquired ii) into international filing activities (EPO) for which drew on data published by the EUROSTAT and the OECD. In selecting our sources, we made sure to gain access to most recent data for the underlying indicator.

We did not use R&D output data from the information system of the MEYS due to reliability issues. Moreover, data from the official statistical sources has proven sufficient for the purpose of the objectives of this study so there was also no real need to draw on the data from the MEYS in greater detail.

2.1.2 Data on patents

National (Czech) patents

Figure 1 shows that number of patent applications of Czech inventors received by the Czech IPO in the time frame from 1997 to 2009 and broken down by type of applicants. As can be seen, the majority of applicants are firms. In 2009, industry applicants accounted, with 440 applications, for around 56% of all Czech patent application to the IPO. The second largest group are private persons who applied 140 times for patent protection in 2009. This corresponds to a share of around 18%. Universities accounted for 136 patent applications (approximately 17%). Patents stemming from public R&D organisations other than universities form the smallest group (72 patents or 9%).

Between 1997 and 2009, the number of applications has increased from 579 to 788 overall. This corresponds to a growth of around 36%. Upon closer examination it turns out that growth occurred primarily between 2004 and 2009 and is primarily attributable to higher patenting activities by universities and governmental R&D organisations. Patent applications by universities increased eight-fold, from 17 applications in 2004 to 136 applications in 2009.

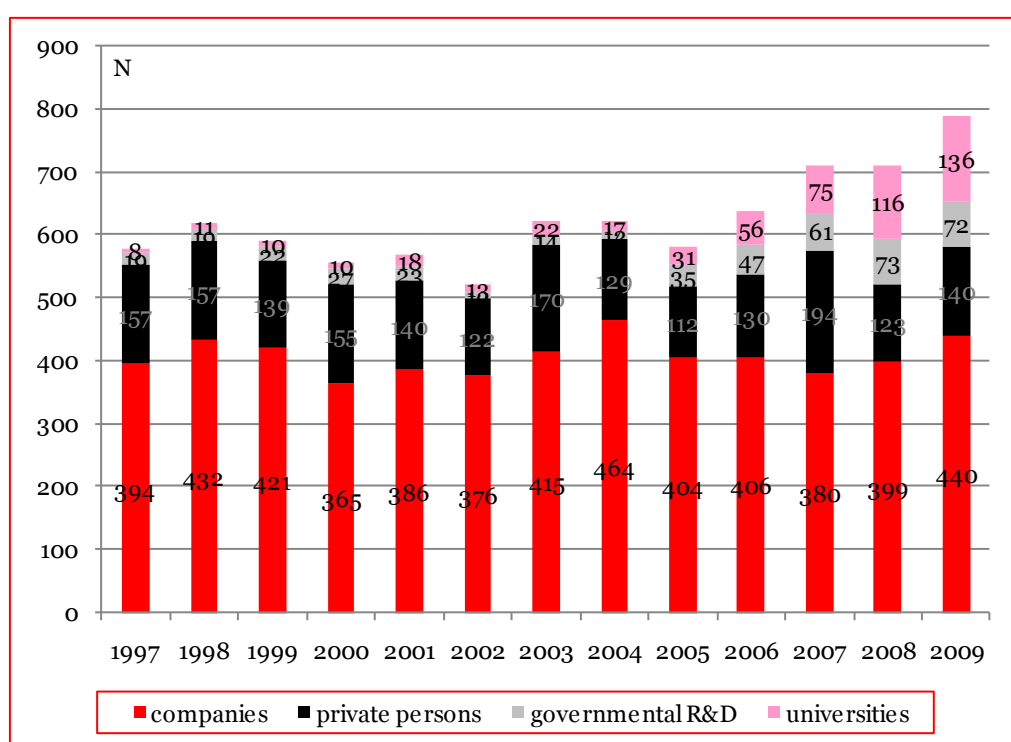
The higher patenting activities stemming from universities and governmental R&D may be at least partly explained by policy drives and by anticipating the effects of the introduction of the evaluation methodology for publicly funded R&D – we have had some indications to this end in our interviews. This methodology grades patents with points which in turn influence institutional funding (see also section 2.2). Differences between governmental R&D and universities in patenting activities (in absolute terms) should not be overrated. There are considerably more researchers in the university sector than in other governmental R&D institutions which means that if patenting

data is normalised with research staff numbers, differences are less pronounced and/or disappear.

Furthermore, from our qualitative interviews, we gained the impression that the CAS seem to apply IP management rules more consciously and may not follow an output-maximising approach to the same extent than the university sector – but, again, this statement is based only a very small number of observations. A light-tower example within the CAS is in this context the Institute of Organic Chemistry and Biochemistry (see also chapter 2.3.2)

Compared to university and governmental R&D, patenting activity by industry and by private persons stayed almost constant between 1997 and 2009. Applications varied in a bandwidth between 365 and 440 patents for industry, and between 112 and 170 patents for private persons.

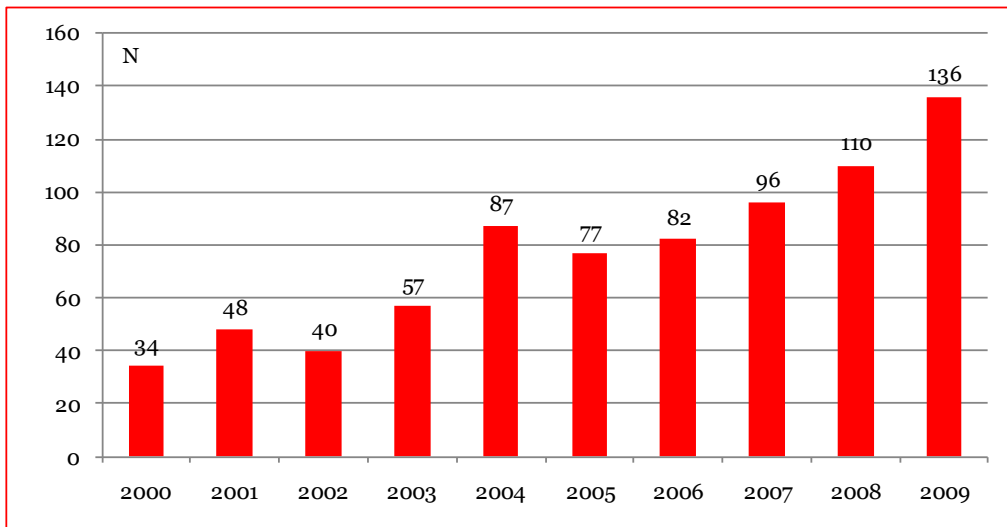
Figure 1 Patent applications of domestic applicants to the IP office of the Czech Republic, by type of applicant, 1997 to 2009



Source: Czech IP office and Statistical Office of the Czech Republic

Figure 2 shows that patent applications of Czech origin at the European patent office between the years 2000 and 2009. A steady increase is visible: Starting with 34 patent applications in the year 2000, the first significant increase (to a maximum of 87 patents in 2004) was between 2002 and 2004, in the time period immediately following the Czech Republic's adoption of the European Patent Cooperation(EPC) treaty in July, 2002. In 2005 and 2006, the number of applications was then lower than in the preceding years.

Figure 2 Patent applications at the EPO where the country of residence for the first named applicant is the Czech Republic, 2000 to 2009



Source: European Patent Office, Annul Patent Statistics 2009

The absolute number of applications by Czech inventors at the EPO can be considered, despite of the increases, low. For international comparisons, however, it is common practice not to examine the absolute number of applications but to normalise such data with variables such as the size of the population.

Figure 3 shows this analysis for the Czech Republic and eight other benchmark countries.⁵

The selected countries are the same as in Vanecek, 2008 who analysed patent data up to the year 2003.⁶ As can be seen, there were 13.2 applications of Czech origin at the EPO per 1 million inhabitants in 2009. This figure place the Czech Republic 6th in the list of benchmarked countries. In 2008 and 2009, Czech applications surpassed those of Hungary which was up until that point leading. In particular, the Czech Republic is placed in front of Greece and Poland. Compared to the other five (Western European) countries, the Czech Republic seriously lags considerably behind. The country placed fifth in the list, Ireland, has more than 10 times as many patent applications at the EPO per 1 million citizens than the Czech Republic.

⁵ It is also considered good practice NOT to compare national patents granted. For once, national patents will always be biased towards incumbent applicants. Secondly, examination procedures and practices can vary across national patent offices. By using data from EPO, both effects can be catered for.

⁶ J. Vanecek, *Patenting propensity in the Czech Republic*, in: *Scientometrics*, Vol. 75, No. 2., pp. 381–394, 2008

Figure 3 Patent applications at the EPO by country of residence of the first named applicant, per mio inhabitants of nine selected countries

Rank	Country	2003	2004	2005	2006	2007	2008	2009
1	DE	275.6	279.3	287.9	302.3	306.9	324.9	305.9
2	FI	281.7	308.0	292.0	328.2	398.8	350.6	281.5
3	AT	124.0	123.9	132.8	142.0	171.7	186.2	186.3
4	BE	132.8	146.8	166.0	179.5	184.9	186.4	160.0
5	IE	79.6	93.9	89.5	100.2	119.1	132.8	134.5
6	CZ	5.5	8.4	7.5	8.0	9.3	10.7	13.2
7	HU	5.5	8.8	7.9	9.5	10.0	10.6	11.2
8	GR	6.5	6.7	6.3	6.6	7.8	8.5	9.8
9	PL	1.0	2.3	2.7	3.3	2.7	4.4	4.5

Source: European Patent Office, Annual Statistics 2009 and Eurostat

Whereas

Figure 3 shows the number of patent applications per 1 mio inhabitants by country of residence of the first named applicant (applicant addresses), it is perhaps even more interesting to examine normalised patent applications by inventor addresses. The reason is that, according to interviewed experts, while a considerable number of inventions are created in the Czech Republic by subsidiaries or R&D departments of foreign firms, the patents are applied for by the headquarters of the firms. An invention created by the Czech branch of Siemens will be for example patented by Siemens headquarters in Munich and would hence count as a German patent. By using the addresses of the actual inventors instead of the applying entities, this effect can be catered for.

The respective analysis for the available data up to 2006 is presented in

Figure 4. As can be expected, larger countries, respectively countries with headquarters of large multinational firms 'lose' patent applications by comparison to the preceding analysis, while smaller countries, on average, gain applications. This is also true for the Czech Republic which had 14.7 EPO applications per per 1 million inhabitants in 2006 if the 'inventor address' metric is used compared to 8.0 if the applicant addresses form the basis. However, the same trend is also visible in other countries. Using the 'inventor address' metric, Hungary gains one place and is now ranked 6th in front of the Czech Republic. Given the low differences and absolute levels of filings, the ranking differences between the Czech Republic and Hungary should not be overrated. The Czech Republic stays still in the lead compared to Greece and Poland, but it is still considerably behind the other Western European countries (though with a narrower gap).

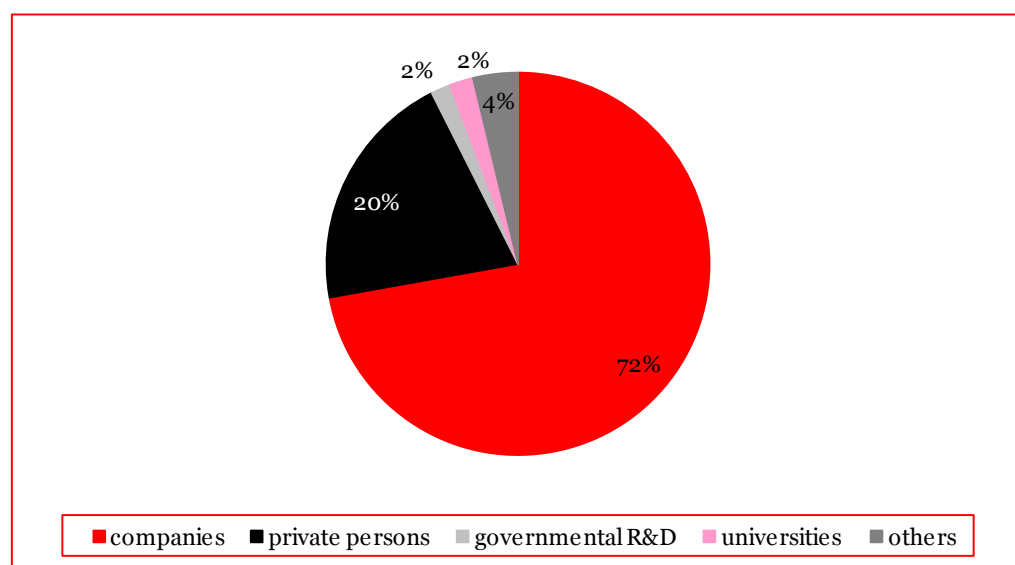
Figure 4 Patent applications at the EPO by country of residence of the inventor, per mio inhabitants of nine selected countries

Rank	Country	2000	2001	2002	2003	2004	2005	2006
1	Germany	267.8	264.4	260.8	263.3	276.2	283.7	283.6
2	Finland	274.6	266.3	241.9	241.3	264.0	247.1	248.6
3	Austria	147.1	149.4	157.4	164.1	175.5	180.0	203.5
4	Belgium	126.6	116.8	124.8	127.5	141.8	135.6	136.4
5	Ireland	54.3	63.6	57.5	55.4	64.6	63.7	64.4
6	Hungary	11.8	9.7	11.8	12.6	15.4	13.4	16.0
7	Czech Republic	6.5	7.0	8.6	11.2	11.1	10.4	14.7
8	Greece	5.1	6.5	6.8	7.9	6.1	9.9	9.3
9	Poland	1.1	1.5	2.1	3.0	3.2	3.2	3.6

Source: Eurostat

A break-down of applicant data by type of applicant for Czech inventors reveals a similar picture as in the case of national patents (see Figure 5). The majority of patent applications is submitted by firms. Firms are also responsible for the increase in patenting activity with the EPO. By contrast, patents applied for by universities or other publicly funded R&D organisations are in a vast minority. These organisations apply each year for a rather constant low two-digit number of patents.

Figure 5 Patent applications to the EPO by applicants from the Czech Republic, by type of applicant, 2006



Source: Eurostat

Further analyses and normalisations are possible (for example, according to the number of researchers, BERD or GERD expenditures or also break-downs by technology fields) but as the analysis of Vanecek has pointed out, the respective results do not change the general picture considerably.

Some first thoughts on the level of patenting activity

The overall statistics has shown the overall level of patenting activity in the Czech Republic is low. In the following sections we will explore barriers and reasons for the

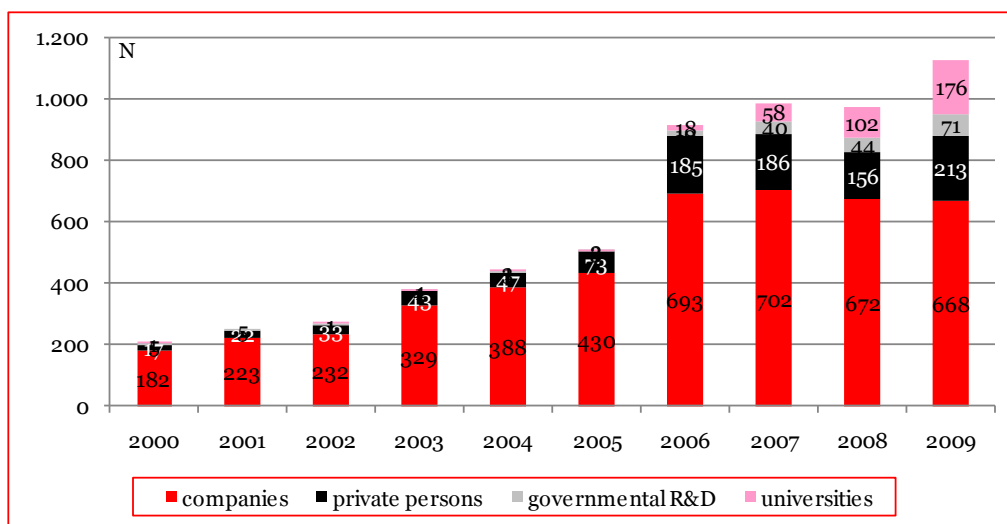
low uptake in greater detail. However, it seems important already at this point to clearly state that filing statistics are only part of the picture. We got the impression that in the Czech Republic there seems to be a dispute whether industry is not patenting enough or whether the research sector is to blame. First, there are sets of specific reasons why industry is patenting at the level it does. The same applies also for the research sector. Secondly, and re-iterating the statements in chapter 1.2, the business/monetary value of patents should be the main determinant of decisions to patent. In an ideal case, one small set of patents can weigh more in terms of commercialisation value than hundreds of other patents (see, as already announced, the example of the Institute of Organic Chemistry and Biochemistry in Chapter 2.3.2). Against this backdrop, we believe that the question of who is to blame makes no sense – industry and research have to address each issues of their own.

2.1.3 Utility model data

As concerns utility model data, we refer to the Czech Industrial Property Office. Figure 6 shows the evolution of utility model registrations in the Czech Republic. Respective filings have increased considerably between 2000 and 2009, from a total of 205 filings in the year 2000 to 1,127 registrations in 2009. This corresponds to a five-fold increase. The majority of registrations were performed by industry which indicates that the utility model has gained considerable popularity among Czech firms for its advantage of low costs and fast registration process.

Interesting to note is also the surge of registrations between 2005 and 2006. In particular, universities and non-university publicly funded research organisations have considerably boosted their filing activities. Universities filed 176 utility model registration in 2009, as opposed to the maximum of 4 registrations per year in the time frame between 2000 and 2005. We attribute this (overall for commercialisation considerations and R&D quality evidencing purposes questionable) development to the introduction of the evaluation system(s) for publicly funded R&D in the latter half of the 2000 years (see also section 2.3.2).

Figure 6 Utility models of domestic applicants valid on the Czech territory according to year of registration, by type of applicant, absolute numbers



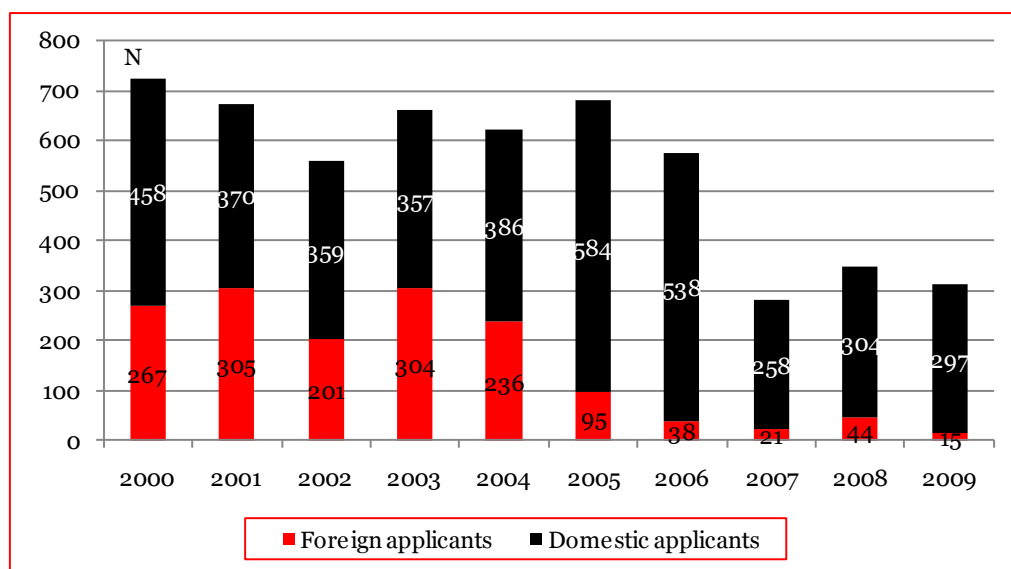
Source: IPO CR

2.1.4 Data on industrial designs

Figure 7 shows the evolution of the number of designs registered nationally in the Czech Republic for the time period between 2000 and 2009. The number of registered designs decreased steadily from 725 in 2000 to 312 in 2009. The development reflects

the introduction of the Community Design (CD) which was enacted in mid-2003. It is especially foreign applications that have decreased in numbers. Since around 2007, the number of designs have stabilised at a level of around 300 applications per year.

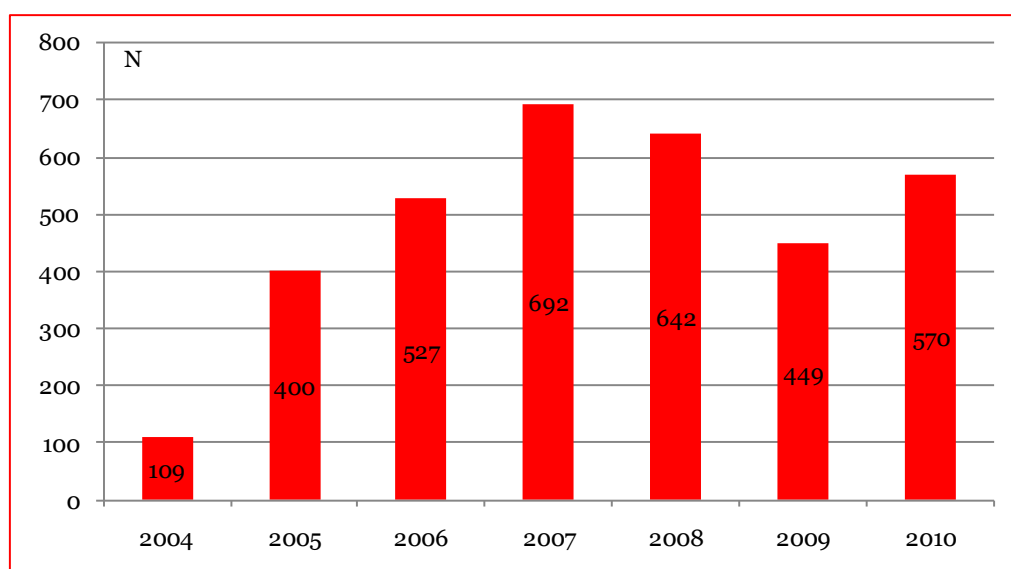
Figure 7 Number of registered designs registered nationally with the Czech IPO, by origin of applicants



Source: IPO CR, Annual Report 2009

With respect to Community Designs (CDs), data from OHIM indicates that the number of CDs increased from 109 in 2004 to a maximum of 692 in 2007. Since then, there has been some decline. In 2010, there were 570 CDs registered by Czech applicants.

Figure 8 Number of registrations of Community Designs (CDs) of Czech origin, 2004 to 2010



Source: OHIM

2.2 IPR usage specifics – relevance and barriers for industry

Whereas in section 2.1 we looked at the number of filings in official statistics, we now turn our attention to barriers to the usage of IPR for. For this purpose, we draw on the results of the online survey and the qualitative interviews.

2.2.1 Relevance of IPR

As concerns industry, we first enquired whether the firms had an IPR strategy. Of those who answered the question (102 out of 160 respondents for the questionnaire overall), 52 (corresponding to 51 % of those answering the question) stated to have such an IPR strategy. Questioned further whether this IPR strategy was part of the overall business strategy, 41 confirmed that they would take a strategic approach to IPR in the specific context of their business goals.

These results are surprisingly good at first sight. In many other studies, lack of a strategic approach towards the topic of IPR has been identified as one of the major reasons for improper use of IPR instruments. However, one needs to interpret these results with some care: On the hand, the figures do not tell us whether the ‘strategy’ pursued is a good one or not. It merely says that there is some longer-term thought about how to use IPR. On the other hand, the sample at hand may not be representative for the overall population of firms in the Czech Republic (and SMEs in particular). The firms in this survey are known to engage in R&D and innovative activities and are therefore listed in the database of the MEYS. We may look at the ‘upper end’ of enterprises with respect to IP awareness and usage in the Czech Republic.

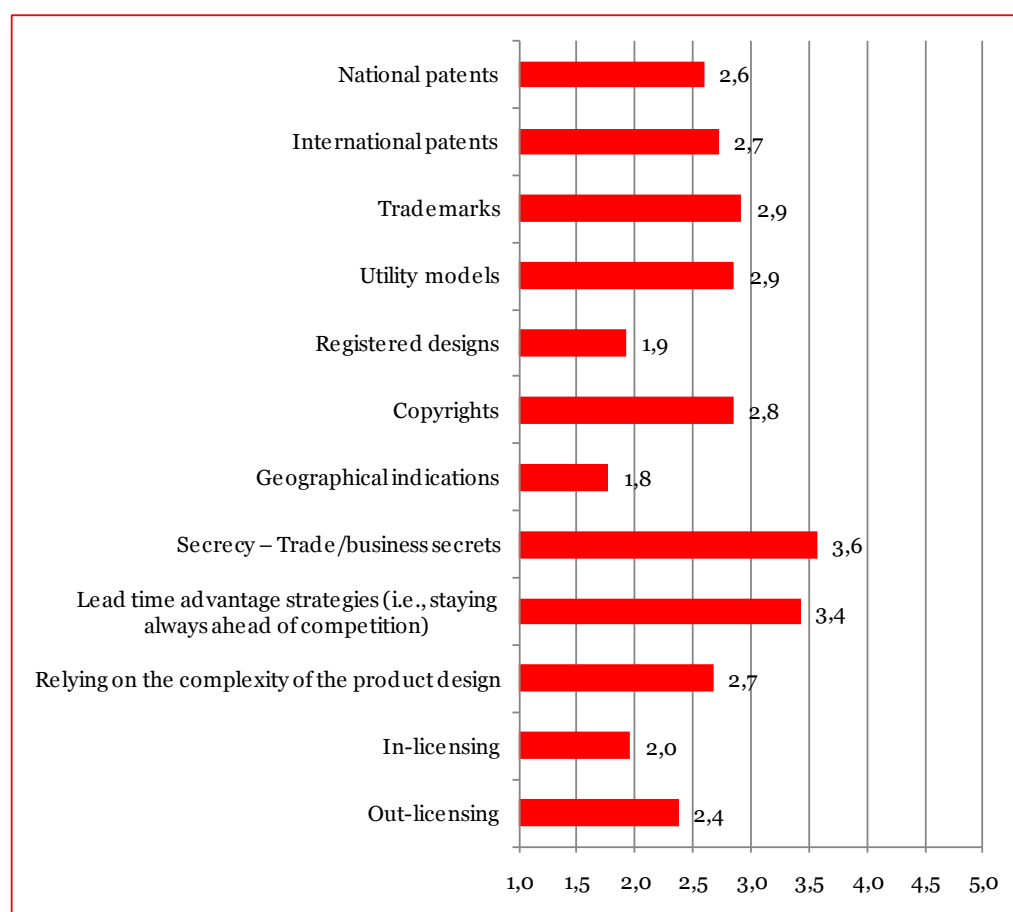
Taken the latter argument into account – and bearing in mind that ‘R&D services’ form a focal sector in the sample -, it is then interesting to note that only relatively few companies actually seem to patent. Of those who answered this question (94 companies), around 69% said to not have filed for patents at the national level between 2007 and 2009, and around 86% did not file at the international level. As for granted/held patents during that period, 71 % stated to not own any valid national patent and 86 % to not possess any international patent. Roughly speaking, hence, only around three out of ten answering companies show ‘active’ patenting behavior by applying for patent protection. ‘Actively’ patenting firms are likely to be spot more frequently in ‘R&D services’ but other than that there are no clear trends visible that would distinguish the group of patenting firms from their counterparts.

In a next step we compare the relevance of different formal and informal IP protection/appropriation mechanisms for all firms sampled. The overall result is displayed in Figure 9. As can be seen, formal instruments of the IPR system have on average medium-level relevance for Czech firms. In particular, patents are rated between ‘to a limited’ and ‘to a moderate’ extent (according to the labels of the scales provided in the questionnaires). Interestingly, both national and international patents were rated on par. Among the formal instrument, the most important is, unsurprisingly, the trade mark and – surprisingly – the utility model. Utility models are rated slightly better than copyrights (which are rated at 2.8 and are hence predominantly ‘moderately important’).

Informal IP appropriation and protection practices are, by contrast, more important than formal IPR. Trade and business secrets receive a rating of 3.6 on average (between ‘moderate’ and ‘large’ extent), making this IP protection method the most important one among those surveyed. ‘Being in the lead’ in terms of innovation (i.e., constantly outrunning the competition with innovations) ranks second (rating: 3.4), while ‘relying on the complexity of design’ is not favoured as greatly (average rating: 2.7).

It is also interesting to note that licensing activities are not considered important on average. In-licensing is on average only of 'limited importance'. Out-licensing fares slightly better (average rating: 2.4), in line with the relevance rating for patents.

Figure 9 Relevance of different IP protection/appropriation instruments for sampled Czech firms *)



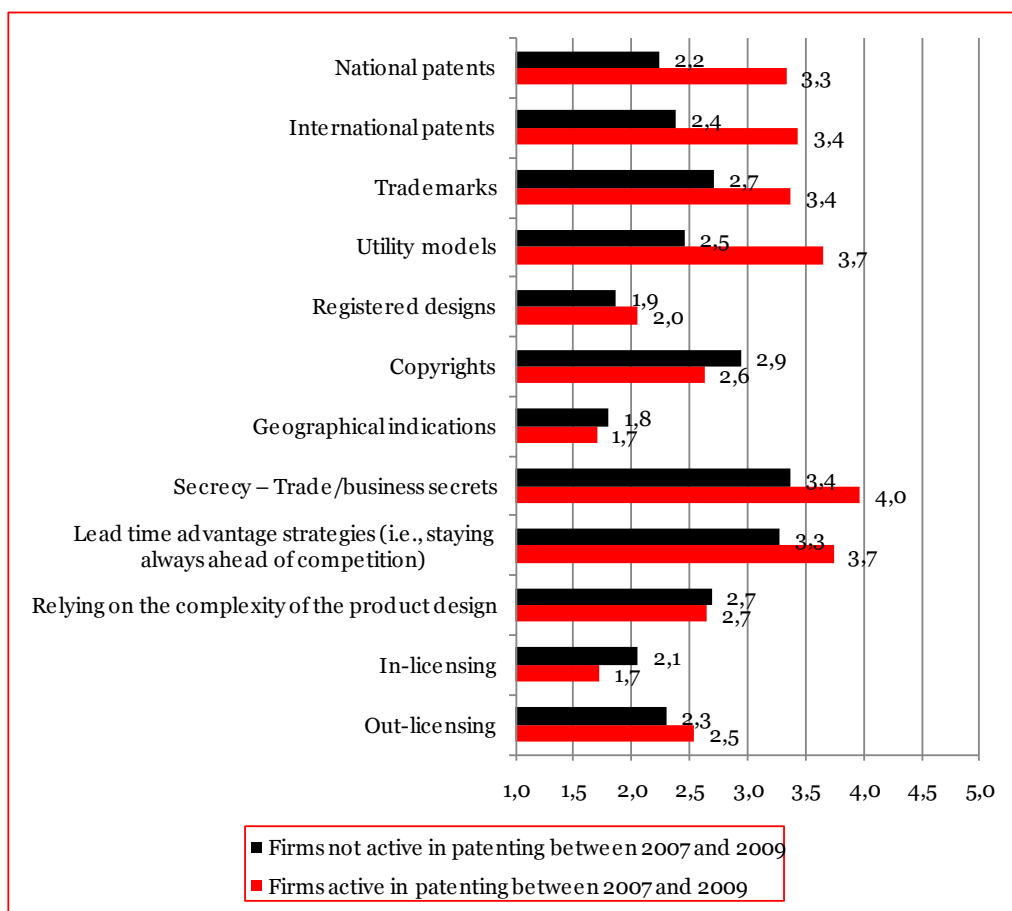
*) arithmetic means on a 5-tier scale from 1 = 'not at all' to 'to a large extent'

Source: industry survey, n = 74

A breakdown of Figure 9 by actively patenting and non-patenting firms reveals some interesting findings (see Figure 10). First, as can be expected, the relevance of patents increases significantly to an average rating of 3.3 for national and 3.4 for international patents, making these instruments moderately to largely important. But not only does the significance of patents rise. Trademarks gain also in importance (rating of 3.4 vs. 2.7 in the group of non-patenting firms), as do utility models (3.7 vs. 2.5). Further, and perhaps counter-intuitively, trade secrets (4.0 vs. 3.4) and lead time strategies (3.7 vs. 3.3) also rise in significance. It is the broad rise of relevance along the whole range of IP instruments that points to the significance of IP management issues: Formal IPR (such as patents) and informal mechanisms (such as keeping things secret) are not reciprocal tools, but are jointly and consciously used together depending on the situational context in order to leverage the IP of a firm.⁷

⁷ This is also reflected in a break-down by firms having and IPR strategy and those who don't. Again, firms with an IPR strategy do not only use the different formal IPR instruments more, but they also place more importance on the informal strategies and tools.

Figure 10 Relevance of different IP protection/appropriation instruments for sampled Czech firms by patent and non-patenting firms *)



*) arithmetic means on a 5-tier scale from 1 = ‘not at all’ to ‘to a large extent’

Source: industry survey, n (patenting firms)= 23 and n (non-patenting firms) = 51

The strong relevance of utility models merits some further thought. Why is it that this tool – which is only available in a selected number of countries, and is also not harmonized to a larger extent among these – is becoming so important?

One explanation could be its role given in the evaluation system in order to secure funding (at least for a research organisation that is partnering with firms). In such a case, the higher demand may be considered artificially induced and may not serve immediately the intended purpose of realising better/high-quality commercialisation. Utility models are cheap to obtain, not examined against their quality and are hence also ‘cheap’ evaluation points. For firms, it would be just a necessary requirement to obtain R&D funding and/or to perform technology transfer with public research organisations (in the sense of ‘doing the research organizations a favour’).

Another explanation could be nonetheless commercial considerations, in particular costs:

“The key issue with patents and utility models is the amount of effort going into examination of the inventive step and assessing the prior art...there is a growing trend internationally that national patents obtain less and less rigorous examination by their national patent offices...this is a question of resources and hence especially an issue for the less developed countries in the world...but even developed countries may follow consciously or by law such an approach (in Switzerland, for

example, national patents are only examined on request)...one may think of utility models as the extreme end of such an approach...if one considers that there are people who say that despite of rigorous examination at the 'high end' international patent offices, there are always possibilities to find prior art that invalidates every patent, inventors not inclined to pay the substantive fees might want to gamble, register a utility model and, if issues arise, leave it to the courts to sort it out." (interviewed IP expert)

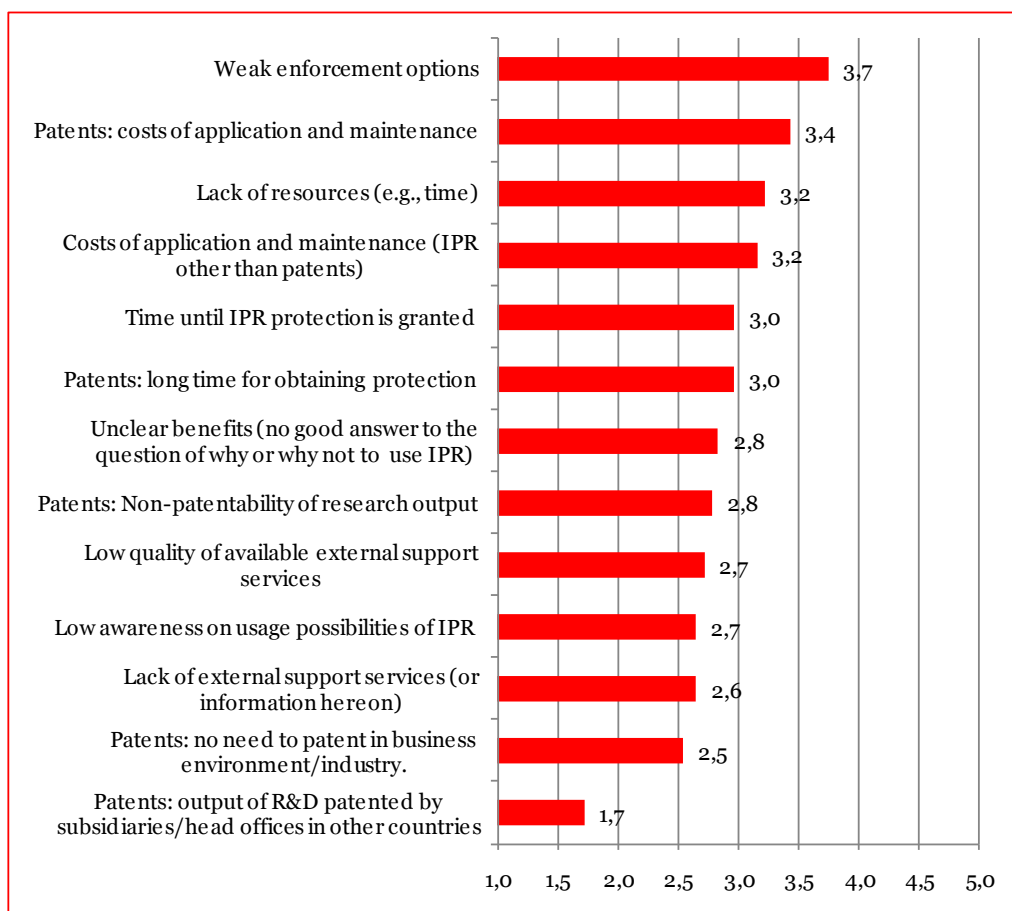
Using utility models could be in this context especially a 'defensive' weapon in the international context. It would bar (or at least make it difficult) for competitors to patent technology described in a utility model.⁸ In the national context, utility models could prove a viable tool for hindering market access. As it is up to the courts to invalidate the model, prospective market entrants must undergo some tedious legal processes to gain access. Especially Chinese firms are said to use the utility model in this manner against foreign firms.

2.2.2 Barriers to IPR usage

Having evidenced that a higher usage of IPR also entails higher usage of informal IP protection mechanisms, the question still remains what the barriers are for a higher usage of formal IPR. The opinions of the firms are shown in the Figure 11. Again, we used a 5-tier scale, this time from 1 = 'no barrier at all' to 5 = 'barrier to a very large extent'. We also made a distinction in some answer categories between purely patent-related barriers and those that refer to all or other IP rights.

⁸ Because after being published in the model, the technology becomes 'prior art' and is hence no longer patentable.

Figure 11 Barriers to higher usage of IPR, as seen by respondents in the industry survey *)



*) arithmetic means on a scale from 1 = 'no barrier at all' to 5 = 'barrier to a very large extent'

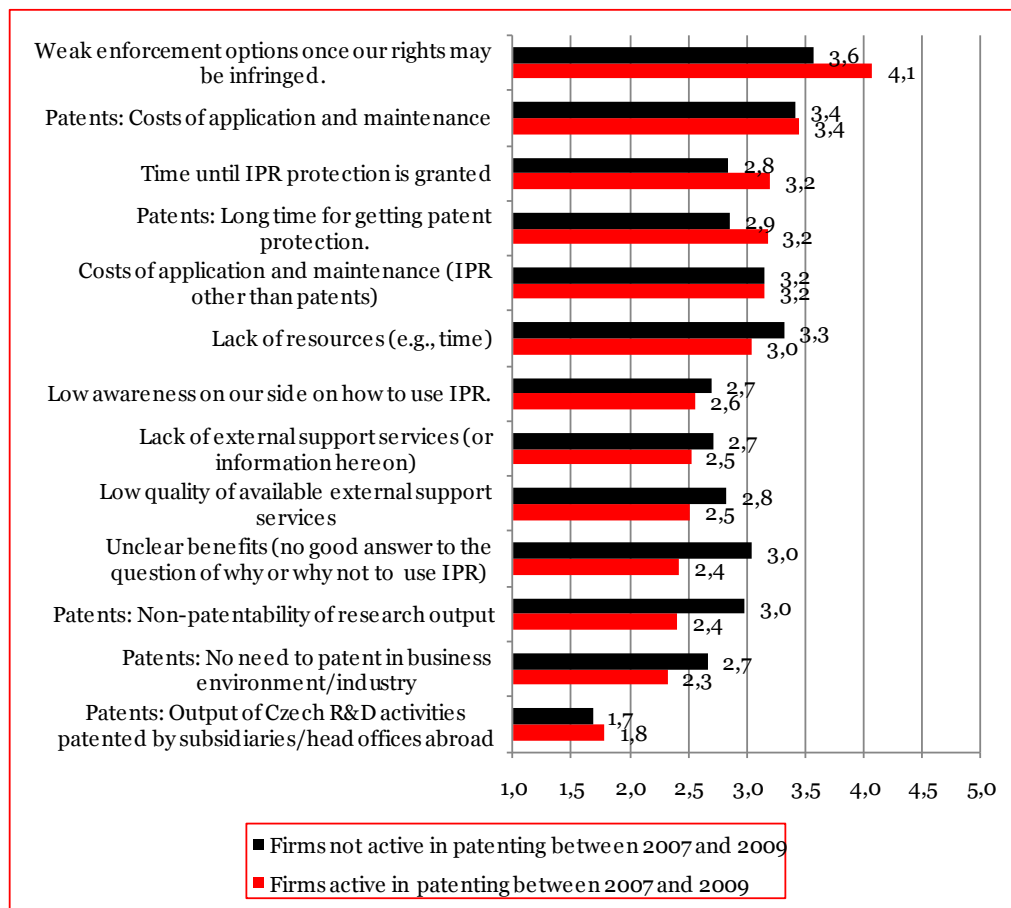
Source: industry survey, n = 76

According to the responding firms, weak enforcement possibilities are the most crucial barrier to higher usage of IPR. This category received an average rating of 3.7 on the 5-tier scale. Ranking second and third are the costs of patenting (average rating: 3.4) and lack of resources in more general terms (average rating: 3.2). Interestingly, costs of applying for and maintaining IPR other than patents is also rated relatively high (3.2). This despite the fact that costs for obtaining, for example, even Europe-wide trademark protection are considerably lower than the costs of patenting. Ranking fourth is the time span between application and actual granting of the right. This category is on par with the question of unclear benefits where firms would not know, for example, why they should or should not patent. Non patentability of R&D output (e.g., because the patentability criteria such as the inventive step criterion are not met) receive a rating of 2.8 and are hence gauged as a barrier of 'moderate' extent. The aspects of 'low quality of external support' (2.7), low awareness on IPR (2.7), 'lack of external support (and information hereon)' (2.6) and no need to patent in the business environment (2.5) are rated similarly as barriers of limited to (slightly more so) moderate extent.

A non-barrier is given through patent rights being registered by headquarters/subsidiaries outside of the Czech Republic. This is due to the structure of the sampled firms, but it nonetheless is an indication that such effects - patent registration abroad – may not be a big issue after all. In fact, the statistical analysis in section 2.1 indicated

the presence of such an effect, but it did not change the picture of the overall performance of the Czech Republic in terms of the number of patent filings.

Figure 12 Barriers to higher usage of IPR, as seen by respondents in the industry survey by patenting and non-patenting firms*)



*) arithmetic means on a scale from 1 = 'no barrier at all' to 5 = 'barrier to a very large extent'

Source: industry survey, n (patenting firms) = 26 and n (non-patenting firms) = 38

Figure 12 shows the breakdown of barriers by patenting and non-patenting firms. Interestingly, weak enforcement is seen as a larger barrier by firms experienced with patents (average rating: 4.1 vs. 3.6 with non-patenting businesses). Patenting firms also gauge the time between application and granting more severely than non-patenting businesses. In the group of non-patenting firms, unclear benefits are a more pronounced barrier, as is no need to patent. The group of non-patenting entities also complains more about lack of resources and also slightly more about inadequate external support.

Break-downs according to other variables reveal for the most part no clear picture. It is interesting, however, that microenterprises with less than 10 employees fear weak enforcement (average rating: 4.0), cost of patenting (3.7) and inadequate external support (2.9) more than firms in larger size classes.

The overall results regarding barriers to wider take-up of IPR are very much in line with studies done also in other, e.g. Western European countries. Costs and enforcement are cited by firms as the most relevant barriers to IPR usage. But like in the case of the other countries, these figures need to be interpreted with care. Just like it is common practice for firms to complain about too high taxes, one may always

expect a larger residual of businesses which express their discomfort with the costs of IPR (no matter how, objectively, small or large such costs might actually be). An indication to this end in the Czech survey is especially the supposedly high cost barrier for IPR other than patents. In practice this should not be too much of a barrier.

Along the same line, the self assessment of the firms which gauge their own awareness of IPR issues rather favourably has to be questioned, even if we consider the sampled firms to constitute the 'higher end' and more IP-aware businesses in the Czech Republic. The analysis of Pitkethly⁹ – which measured SMEs understanding of IPR issues directly – shows that in the UK about nine out of ten SMEs do not know, for example, that publishing before filing would invalidate a UK patent application. Posing several such questions it became clear that the overall awareness level on IPR with UK firms is fairly low, especially in small firms.¹⁰

Notwithstanding the arguments with respect to industry and ownership structure and level of economic development – which sets a limit to the amount of firms for which IPR is relevant –, extrapolating these findings to Czech firms for which IPR would be an issue is certainly not farfetched. For once, there was overall consensus among our interview partners that lack of awareness on the functioning of the IPR system with Czech firms may in fact be the prime obstacle to higher IPR use. This general observation, reflecting by the experience of the interviewed experts, seems even more plausible if systemic and historic considerations are taken into account

As explained in the section on the legal IPR provisions in the Czech Republic, there is no far reaching IPR tradition in the Czech Republic. Applying for patents was more of a 'sports thing' and not overly backed in communist times by the regime. Certainly, Western countries such as the UK have a longer standing tradition in this regard.

Secondly, and pertaining especially to patenting in the international patenting system, there are reasons to argue – in an admittedly exaggerated phrasing – that the current international (European) patent system is, for practical considerations, largely irrelevant and inexistent in the Czech Republic. This argument merits more in-depth treatment and is especially of interest for the on-going debate on the introduction of unified European Community Patent. In fact, the introduction of a Community Patent was a recurrent subject raised by most of our interview partners.

As stated in section 1.1, patents currently filed with the European Patent Office do not lead to one single 'European' patent, but to a bundle of national rights. Under current rules – and not considering the provisions of the London agreement which simplifies the procedure for some countries¹¹ – applicants have to designate with the EPO in which of the European countries they want to have patent protection and have translations into the native languages prepared for each of these countries.

Because of the fact that most companies do not need protection in every Member State and because of the costs, it is common practice to focus the validation on a selected number of key countries and markets (on average, around five). As a result, validation is frequently not sought for in smaller countries with 'less common' languages.

⁹ Pitkethly, R., *UK Intellectual Property Awareness Survey 2006*, UK IP Office, London, 2006

¹⁰ The survey of Pitkethly also enquired into the presence of a number of established good practices when designing and implementing an IP strategy/policy. The unfavorable results put also a question mark on the quality of the IP strategies pursued (if there are any). This may serve as a basis for questioning whether Czech firms with an IPR strategy would perform similarly in comparison to UK businesses.

¹¹ The Agreement on the application of Article 65 of the European Patent Convention (EPC) – the London Agreement – is an optional agreement reached in the year 2000 aiming at reducing the costs relating to the translation of European patents. Its signatory states waive some requirements for translations. The Czech Republic is not signatory party to the London Agreement.

Only about 5% of the patents granted by the EPO are also validated in the Czech Republic. This means that 95% of technologies patented with the EPO do not enjoy patent protection in the Czech Republic. It is important to underline that within this 95 % share it is perfectly legal to use patented technologies on the Czech market (e.g., by Czech firms) without need of approval or license from the patent holder. It is for these figures combined with the low filing numbers by Czech entities with the EPO (see section 2.1) that one could be tempted to say, in the stated exaggerated manner, that the European/international patent system is by and large non-existing and irrelevant for Czech inventors.

The introduction of a unified European Community Patent would change this situation all of a sudden fundamentally. With a Community Patent, each granted patent at the EPO will lead automatically to a valid patent in the Czech Republic, most likely also enforceable centrally in Europe. Against this backdrop, two diverging views on the Community Patent became visible:

- Opponents – primarily Czech IP professionals – were of the opinion that Czech innovators are ill prepared for the current situation. The main danger would be that a Czech firm would face a significantly increased risk of being sued for patent infringement over practices that have been legal so far. Different language regimes – a Community Patent specification would be likely only written in English, French or German -, would mean that Czech firms would be forced to screen large international patent databases regularly and be savvy in the three languages of application and their specific use in the patenting context. A third reasoning eventually focuses on the costs: A Community Patent would likely be cheaper than the current bundle of rights resulting from an EPO application. But it would still cost more than a current national Czech patent “...which is completely sufficient for many Czech needs, especially for SMEs” (expert interview). The cost barrier will be on average hence more significant for a Czech firm than for a better capitalised similar enterprise, say, in Germany. Overall, opponents see the Community Patent as a vehicle primarily favouring large richer countries and large multi-national firms.
- Proponents of a Community Patent – some Czech experts and the international experts interviewed – acknowledged the issues raised. However, they stated that the arguments are too narrowly considered. Already now should the international prior art be analysed to assess the inventive step, even when patenting is only considered at national level. And while it is true that only a fraction of the granted patents are validated in the Czech Republic, the figures are different in the application phase. At the time of application, applicants keep their options wider and state their aim to validate in much more countries than they actually do once the patent is granted. For Czech firms there is hence always a risk or a gamble that a patent applied for at the EPO will be validated in the Czech Republic.

Furthermore, some experts also pointed to the fact that a patent infringement must be also detected by the patent holder, and respective legal action taken. It stands to question whether a small Czech firm which infringes a patent locally would be detected, and even if, whether it would prove worthwhile suing the firm. Of course, this is a function of the commercial gains from a patent. Legal action becomes more likely if the market impact of the actions of the infringing firm increases. Eventually, - and in line with the international discussion – there was also the notion that many opponents of a Community Patent would only act in their own economic interests: Being mainly IP professionals and patent attorneys, they would forego opportunities to make money with translations. Should language problems still arise there would be the option of machine translation, a field which has seen considerable technological progress lately.

It must be stated at this point that the discussion on a Community Patent is an old one, dating back as far as 1975.¹² Many experts have lost faith that such a patent would become reality any time soon. However, there is progress on the way towards a Community Patent. In particular it was communication 2007/165 issued by the European Commission in 2007 which re-ignited negotiations in recent times. The ensuing discussion led to the following features being generally accepted for a Community Patent: unitary title, respect of Community legal order, co-existence of European and national patents, affordability (SME-friendly) and cost efficiency, legal certainty, high quality, non-discrimination, pre-grant phase regulated by the European Patent Convention (EPC) and post-grant phase regulated by the Community Regulation.

There are two primary outstanding issues concerning the Community Patent itself: translation arrangements and the distribution of revenue from renewal fees among Member States (the introduction of a central European court for patents is another separate issue). It is especially the first issue of translations which proves to be an obstacle for further progress. As stated, languages to be used for patent filings should be, according to a proposition of the European Commission¹³, English, German or French, the official languages of the European Patent Office. Spain and Italy, however, explicitly oppose this proposition.

Without the prospect of consent among all countries of the EU-27, around a dozen countries¹⁴ teamed up in December 2010 and approached the European Commission to introduce a 'Community Patent light' only for selected and willing countries.¹⁵ The current situation is that the European Commission stated to support this proposition. On January, 27 2011 the European Parliament's Committee for Legal Affairs endorsed this proposition, too, thus effectively creating another milestone towards implementation of the Community Patent light.¹⁶

The official Czech policy is for a unified Community Patent. In light of the advances made towards the Community Patent and the official Czech position, the question may be raised why to put the subject on the table so prominently in this report. For once, one might contemplate the suggestions of the opponents: a Europe of different speeds, i.e. where the Czech Republic would become part of the Community Patent system only after is ready to (akin to, as one expert put it, "...the introduction of the Euro"). We would not go as far in this argumentation, as the international context with its increasing significance of the IPR system puts pressure on Czech actors to increase their knowledge and usage of patents and IPR anyhow.

2.2.3 Conclusions

What does this mean in the conclusion for the enterprise sector? Taking also the results of the statistical analysis into account, we have seen for once fairly low filing activities in the field of formal IPR. Explanatory factors are for sure, and as

¹² Radauer, A. and Rodriguez, V., *Towards an Intellectual Property Rights Strategy for Innovation in Europe*, Report for the SCIENCE AND TECHNOLOGY OPTIONS ASSESSMENT (STOA) Board of the European Parliament, Brussels, 2009

¹³ European Commission, *Proposal for a COUNCIL REGULATION (EU) on the translation arrangements for the European Union patent*, COM (2010) 350

¹⁴ France, Germany, Slovenia, Denmark, Estonia, Finland, Lithuania, Luxemburg, the Netherlands, Poland and Sweden

¹⁵ heise.de, 'EU-Kommission für Miniatur-Gemeinschaftspatent' (EU Commission for miniature Community Patent'), available online at <http://www.heise.de/newsticker/meldung/EU-Kommission-fuer-Miniatur-Gemeinschaftspatent-1150093.html>, December 2010

¹⁶ heise.de, *Geplantes "EU-Einheitspatent" kommt voran* (Planned unified EU patent shows progress'), available online at <http://www.heise.de/newsticker/meldung/Geplantes-EU-Einheitspatent-kommt-voran-1179641.html>

corroborated by experts, Czech industry structure, ownership structure and level of economic development. Only few select firms in respective industries (e.g. life sciences) and niches engage in using a broader spectrum of formal and informal IPR. There is also a lack of patenting tradition from communist times to mention: Patenting was considered “...more than a sport, a means to recognise the efforts of the inventors socially” (expert interview). In fact, in our interviews we have come across a Czech firm which is still only patenting for the reason of motivating their employees. Against this backdrop, IPR may be only a topic for a select part of Czech industry.

The sample of surveyed firms – active in R&D and more exposed to IPR issues - could be probably best described as for the most part passively and moderately accessing the IPR system, akin to the role of ‘observers’. In general, there is good reason to believe that awareness levels on IPR are low within Czech industry, even with those few firms for which IPR would be theoretically relevant. As concerns patenting, one can say that the current international (European) framework attributes to this low awareness level. Any short-term and medium-term introduction of a Community Patent system is hence a (further) clear call to invest in raising awareness on IP, in order to overcome chances (or fears) that a ‘Community Patent shock’ becomes reality.

2.3 IPR usage specifics – relevance and barriers for academia, with a focus on patenting

2.3.1 Background

In the section we discuss IPR issues within the subject of technology or knowledge transfer between research organisations (i.e., ‘science’) and industry, and herein particular patenting. The wider topic of science-industry linkages is not covered here. It is, however, the subject of a dedicated report to the Czech audit. Hence, this section will highlight only a certain aspect of technology transfer.

The current discussions on and the various concepts for fostering technology transfer are heavily influenced by developments in the U.S. with their origins in the early 1980s. In particular, the adoption of the ‘Bayh-Dole Act’ in 1980 can be considered a key milestone. Simplified speaking this piece of U.S. legislation transferred ownership of IP rights resulting from federally funded research to the researching institutions, especially universities. The aim was (and is) to increase commercial exploitation of inventions and to incentivise the usage of IPR by universities through providing an additional income channel: patenting and out-licensing of these patents to industry.¹⁷

The adoption of the ‘Bayh-Dole Act’ boosted the development of technology transfer offices (TTOs) at universities. Their responsibility is the marketing and commercialisation of IP(R) generated at universities. Predecessor departments existed already earlier (in the form of industry liaison offices), but Bayh-Dole amplified developments of strong TTOs and forced many universities to think about patenting more. Bayh-Dole became increasingly successful also outside of the U.S. Many countries in Europe or in other parts of the world have adopted similar legislation, replacing in many instances a system of a ‘professors privilege’ where the IPR is owned by the main researchers themselves.

A central and recurring theme in the discussion on fostering technology transfer through ‘Bayh-Dole Act’-like legislation is its focus on the topic of IPR, i.e. patenting and licensing. Recent analyses show that expectations raised by ‘Bayh-Dole’ have been

¹⁷ Before, it was the state – in the form of the several agencies and departments at Federal level – that owned the IPR. In-consistent patent policies and rigid conditions to access and exploit the IPR were said to be responsible that researchers and industry alike were hardly inclined to bring the R&D results to market. Rigid conditions related especially to too little ownership control and too little access to the IPRs (e.g., non-exclusive licensing where several parties could benefit from the same invention) which was said to make licensing for industry players unattractive.

hardly met in practice.¹⁸ While data of the annual licensing survey of the AUTM (Association for University Technology Managers) shows that licensing income has increased profoundly between 1991 and 2005, it still accounts only for a small share of R&D expenditure (around 3%). Moreover, there are concentration effects visible: The largest share of licensing income is generated by a hand full of ivy-league colleges. Most universities do not earn any significant licensing income. For the top-3 universities in terms of licensing income it was also found that the revenue streams resulted from very few selected inventions and in narrowly defined technology fields (e.g., life sciences).

If one were to contrast the revenue with the costs associated for obtaining the income – legal fees, patenting fees, staff costs in the technology transfer offices – the balance would be most of the time negative:

„...the direct economic impact of technology licensing has been relatively small – a surprise to many who believe that royalties could compensate for declining federal support of research. Because of the high costs of patenting, most university licenses barely break even”. (Lita Nelson, head of the technology transfer office at the Massachusetts Institute of Technology (MIT) 1998, quoted in Sampat (2009)).

One of the key criticisms of the ‚Bayh-Dole’ model for fostering technology transfer is its strong focus on IPR and patenting. Many studies show that non-IP channels of technology transfer – such as informal networks, consulting, training etc. – are far more important.

Having said that, one also needs to underline that there is still a role to play for IPR and patents as one possible avenue for commercialisation of R&D results. The key message is, however, not to look at the patent as such but as a tool that which provides commercial value. This means that commercial considerations should be the prevailing rationale for using IPR:

“You have to think of IPR and patents just like a car producer would think of cars. A produced car – equivalent to a granted patent – is on the front side of no use. It is the sold car that counts. And, in order to sell cars, you have to provide a good and appealing product for your customers. Otherwise you would only have production costs and no income...you could of course also, in your car line, have models that do not sell or only at a loss, for strategic or marketing reasons...but even then you would think on a commercial basis...you would not build and produce cars which do not make sense from your business point of view” (interviewed expert).

“The thing with technology transfer at universities and research organisations is that the primary incentive should be to make money, to get rich...and if the costs of applying for a patent are borne directly by the institution there will be some thought to whether patents should be applied for or not”. (interviewed expert)

In this context it becomes clear that the ‘IPR management’ discussion portrayed in section 1.1 is also applicable to research organisations. Depending on funding structures, the organisation’s goals in R&D and the overall mission, different channels of commercialisation are to be used according to the context of the R&D undertaken and strategic considerations.

¹⁸ See literature review in Sampat, B., *The Bayh-Dole Model in Developing Countries: Reflections on the Indian Bill on Publicly Funded Intellectual Property*. UNCTAD - ICTSD Project on IPRs and Sustainable Development. Policy Brief Number 5, October 2009. ICTSD: International Centre for Trade and Sustainable Development, 2009

It is interesting to note the current recommendation of the Commission concerning a 'Code of Practice' for transfer activities for universities and other public R&D organizations in this context.¹⁹ This recommendation caters, on the one hand, for the importance of non-IP channels in several ways. For example, it replaces the notion of technology transfer by that of the broader knowledge transfer concept paving the way also for more (non-)IPR channels of commercialisation.

Without prejudice whether the recommendations are really in their entirety a 'gold standard', and as concerns IP, the EU recommends that universities should develop their own long-term IP policies. These are to comprise rules for researchers on how to handle research results (e.g., in terms of reporting requirements or secrecy requirements concerning inventions made at the universities). The Commission further recommends that IP should be identified, but it leaves it specifically open whether (and if yes, what) IPR instruments and protections strategies should be employed. In particular, the Commission points to the possibility of placing R&D results as an option in the public domain.

The bottom-line of this excursion into the role of IPR in technology transfer, and in particular patents, are hence four-fold:

- IPR, and in particular patents, are in the focus of many discussions on commercial exploitation of R&D results by universities and research organisations.
- Usually, expectations concerning the amount of income derivable from patenting and licensing are too high. Other channels of technology/knowledge transfer are in many instances more important.
- IPR and patenting and licensing plays nonetheless a role as one option/route for commercialisation.
- One key success factor is a sound incentive system based on commercial considerations and in line with the overall strategy of the research organisation.

It is especially the latter point which indicates that IPR and patenting/licensing decisions are a management topic.

In the following, we use the example of Imperial Innovations in the UK, the technology transfer company doing research commercialisation on behalf of the Imperial College of London, to highlight how the commercial aspect rules over simple patent filing procedures and how it has led to the formulation of a specific process approach to technology transfer.

¹⁹ European Commission, *COMMISSION RECOMMENDATION on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organizations*, COM(2008) 1329, Brussels: 10.4.2008

Case study: Imperial Innovations

Imperial College is the largest applied technology university in the UK. It is also the largest academic institution in the UK with respect to turnover and research income. The College has a strong interdisciplinary research base and is committed by charter to a research environment especially in its applications to industry.

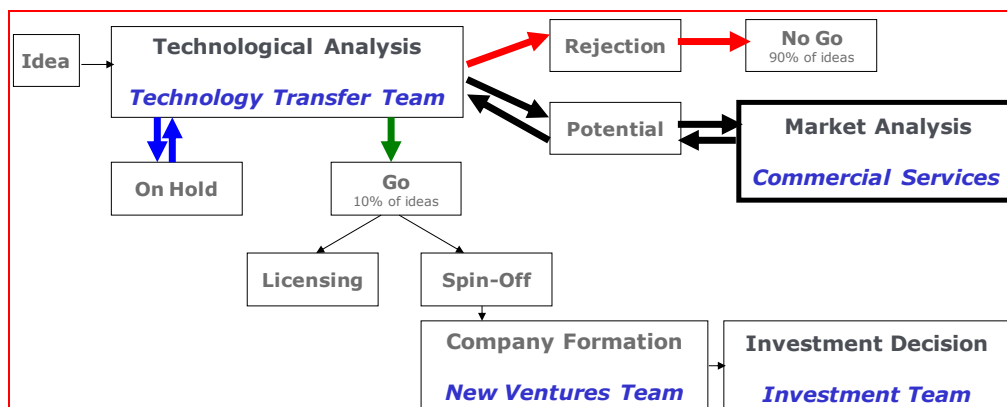
Technology transfer and commercialisation of R&D results are handled by Imperial Innovation, a separate company established by the Imperial College for the purpose of technology transfer in 1986. In 2006, Imperial Innovations became a publicly listed company on the Alternative Investment Market (AIM) of the London Stock Exchange. It performs now technology transfer services based on a contractual arrangement for London Imperial College up until 2020 based on a contract with the college. However, Imperial Innovation may now undertake the commercialisation of research also from other organizations.²⁰

Notable is the specific process by which Imperial Innovations decides on the usage of IPR. Once the idea (invention) is being submitted to the company, it is first assessed by the technology transfer team and subjected to a technology analysis. About 90% of the ideas are rejected. For the remainder, a market analysis is performed in order to assess the commercial potential by a different team. Depending on the results of the analyses whether the idea/invention is out on hold or whether the commercialisation process is started. Depending on the results of the analyses, a decision concerning IPR and channels of commercialisation. Two avenues are there as alternatives: licensing or creation of spin-off firms. If the latter option is selected, two other teams pick and aid in the support of company formation (new ventures team) and in any investment decisions made (investment team).

It is clear from this chart that patenting as such is subject to market assessment decisions, and not (solely) to patentability criteria and even less on a system that values patents with grades or points as output of publicly funded research.

As of April 20, 2006, Imperial Innovations had equity holdings in 58 spin-out companies and has concluded over 100 intellectual property agreements arising from the Colleges research activity.

Figure 13 Investigation of the market potential of new incoming project proposals at Imperial Innovations



Source: http://www.fitt-for-innovation.eu/index.php?id=fitt_marketing, as of January 30, 2011

²⁰ Imperial College, Technology transfer company established by Imperial College London to float on the Alternative Investment Market of the London Stock Exchange ("AIM") (the "Flotation"), Press Release, 20 July 2006

2.3.2 The (framework) conditions in the Czech Republic

Having highlighted main points on the usage of IPR in technology/knowledge transfer processes, we now turn our attention to the specific situation in the Czech Republic. In the Czech Republic, two arrangements have major influence on patenting and IPR activities of universities and research organisations:

- *Legal framework:* According to Act No. 211/2009 on the support of research and development is the Czech piece of legislation that deals with ownership of IPR results from state-funded research. When interviewing leading IP experts in the Czech Republic on the provision, we found to our surprise considerable variation in the way the legislation is interpreted. First, all interviewees told us that the law states that R&D organisations are to ensure legal protection of results of publicly financed R&D activities, provided that these results are protectable with the instruments of the IPR system (§ 16, Article (2)). But then, diverging views emanated. Some experts stated that research organisations would be by law obliged to transfer these rights to the authority which has provided the funds/grants. This would mean that the Czech Republic has adopted legislation that implements in various aspects the way such IPR was treated by the U.S. prior to Bayh-Dole. It would be a system of institutional ownership by state authorities.²¹ On the other hand, other interviewees and comments re-assured that Act No. 211/2009 would actually implement Bayh-Dole-style legislation. It seems that there are ambiguities in the way the law is worded in Czech language – an issue which may not have become apparent as there may not have been any court cases on that matter yet. We cannot judge who of the interviewees – all renown experts – is right. However, we recommend reviewing the legislation.
- *The evaluation methodology:* The evaluation methodology for R&D results of 2010 assigns points to various types of outputs of R&D, including IPR and here in particular patents, utility models and industrial designs.²² These points ‘grade’ so to speak the R&D results and are the basis of funding decisions. The evaluation methodology clearly assesses IPR as an important research output: Irrespective of the research discipline, 500 points are given to patents filed with either the EPO, with the U.S. patent office or with the Japanese patent office, respectively. This places such patents on the same level as an article in a prestigious impacted journal like Nature or Science. It is also the maximum amount of points achievable for any type of research output. Czech or any other national patents (except for U.S. and Japanese patents) receive up to 200 points, provided that they are actively used and out-licensed. 200 points are the second to third highest amount of points achievable (the research output ‘impacted journals’ may lead, after assessment via a formula, to between 12 and 305 points). Other national patents for which no licensing arrangement has been (yet) reached receive 40 points. The same amount of points is awarded to utility models and industrial designs.

In the following, we analyse these two framework conditions from an IPR point of view. This applies in particular to the analysis of the impact of the evaluation system – readers interested in the analysis of the system as a whole are referred to the respective report.

²¹ Under this interpretation, the funding providing bodies may nonetheless waive their right to ownership. Research organisations are entitled to re-imbursement of costs related to the IPR filings. If a publication/disclosure is sought for before the applications to the IPR titles are handed in, the researchers need to get authorisation from the funding bodies.

²² Interestingly, there is no explicit reference to copyrights, although some type of outputs is likely to coincide with copyrighted works to some degree (e.g., software). There is also no specific mentioning of trademarks due to such trademarks not being the result of an R&D project.

From the narrower view of IPR, and taking the opinions of interviewed IP professionals into account, the following issues emerge:

- The point system employed in evaluating R&D results is regarded as too rigid. Proper IPR management needs more freedom to select between various formal and informal strategies and instruments. Placing points on specific IPR instruments makes little sense in this context. It creates a bias in the portfolio of IPR tools: *“Having so many points available for European and national patents means that R&D results which should likely stay a secret are published in the patent. For results that would nonetheless be patented, the process of filing for applications will be unduly speeded up which means that the R&D result stays less time secret than it should. It also discourages defensive publishing”* (interviewed expert).
- The system encourages patenting with no commercial value, just to obtain the points: *“The researchers do it only for the points. They will never be any commercial value from such activity. And, to make things worse, this costs a lot.”* (interviewed expert). Only one IPR instrument, the 200 point national patent with licenses based on it, has a commercial link with its usage requirements.
- On the technical level, the evaluation system also favours the filing of many patents, each with a smaller number of claims, while in reality it would be possible (and perhaps more feasible) to file only for one patent which then has also more claims.
- Apart from its rigidity, it is also inconsistent in the distribution of points among the various IPR instruments. Especially, it does not account sufficiently for the territoriality principle, i.e. that all patents granted world-wide today are in fact only national rights.

This can give rise to a number of circumvention strategies, at least theoretically. For example (and not taking fee structures into account), an applicant could choose to apply for a patent with the EPO and designate only one country (such as Germany) as the country where the patent is valid. Such a patent would be worth 500 points, as opposed to the patent filed directly with the German patent office. Both patents would be the same – a patent valid only in Germany – but one would be worth 500 points, the other only 40. Even worse, if the German patent would lead to revenue streams (what should be aimed for), it would still count only 200 points. Such a 200 point patent is clearly more valuable than a 500 point patent applied with the EPO which is not commercially exploited.

The territoriality principle also entails that the regions for which protection is sought for are usually selected according to commercial considerations, i.e. where the patent holder has a viable market interest: *“It is not entirely clear why the system favours certain regions, i.e. the U.S. and Japan, and others (Germany, France) not”* (interviewed expert).

- The rationale for providing 40 points for utility models as a research output is to be questioned. Utility models are by definition not examined. The documents are merely registered and their content not checked. Utility models can be hence considered ‘cheap money’. Again, this likely causes surges in utility model registrations with no further goal and R&D quality substance other than to ‘buy’ and leverage institutional funding literally with money (and this can be observed already with the data from the statistical analysis in section 2.1).
- As concerns Act No. 211/2009, there were considerable concerns by those who interpret the law in the direction of state ownership of IPR that the law would discourage patenting by research organisations. Researchers and research institutions would not have an incentive to patent for they would not be able to take advantage of revenue created through out-licensing. Moreover, according to one expert, negotiations with state authorities with little awareness on IPR issues

would be difficult. Such low awareness at state authority level constitutes hence another barrier, according to this expert.

Overall, there was consensus among the interviewed experts that the current incentive system is highly ambiguous and is flawed at many levels. It fosters patenting and IPR application primarily through increasing the output of IPR filings, but at the same time does hardly cater about commercialisation and respective incentives for researchers and research organizations.

Licensing and the case of the Institute of Organic Chemistry and Biochemistry of the CAS

It is very interesting to note that the Czech Republic may be a textbook example of the finding shown in section 2.3.1 that the value of patenting activities by research organisations is highly skewed and concentrated. In chapter 2.1.2 we noted on the relatively low level of patenting activity in the CAS (compared to the already low level of universities).

Against this backdrop, it may come to a surprise that licensing income for the CAS accounted for 13.2% of the overall budget available to the Academy. The average for U.S. research is around 3% of R&D budgets, the corresponding share for the EU even lower. The CAS share of licensing income corresponds to a value of around 1.13 billion CZK or around € 46 million – a significant amount of funds.

This success can be primarily traced to the licensing activities of one institute, the Institute of Organic Chemistry and Biochemistry (IOCB). According to a short interview with the institute, 98% of CAS licensing income is derived from a set of patents on anti-retroviral drugs for HIV and hepatitis developed and licensed by IOCB. In fact, the IOCB research team around Prof. Antonin Holy succeeded, in collaboration with KU Leuven with whom licensing income is shared, in developing what experts consider the most effective HIV treatment up to date.

In 2006 the US biopharmaceutical company Gilead Sciences together with IOCB established a new research centre to pave ground for further research. Gilead donated over US\$ 1.1 million to fund research at IOCB for an initial period of five years.²³ Research from Holy's team resulted in a series of medications being licensed: In 1996, Vistide was approved for the U.S. and European Union markets. Viread (tenofovir) can be used in the USA since 2001 for the treatment of HIV, and Hepsera since 2003 for hepatitis B. Truvada, a combination of Viread and emtricitabine, was FDA-approved in 2006.

IOCB established its own technology transfer company (IOCB TTO s.r.o.) which links the research generated by scientific staff at the institute with its patent and licensing processes.²⁴ Besides the antiviral drugs, IOCB TTO reports also successes in the field of peptidic drugs and natural substances. The TTO firm also handles spin-off company formation. As of March, 2011, there are two spin offs (one of which uses also IP from other universities outside the Czech Republic and may be hence considered a joint-inter-university spin-off of three universities).

2.3.3 The view of researchers and directors

Following this more general discussion on the technology transfer framework conditions, we now turn to the researchers themselves.

²³ Gilead Sciences, Gilead Sciences and the Institute of Organic Chemistry and Biochemistry (IOCB) Establish New Academic Research Centre in Prague; Donation by Gilead Honors Leadership of Dr. Antonin Holy in Antiviral Drug Discovery and Development, press release, July 13, 2006

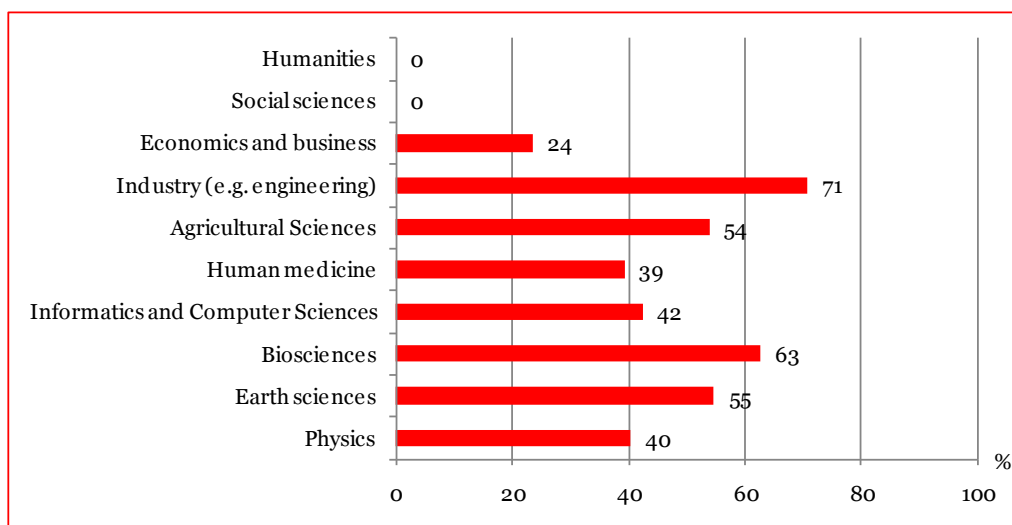
²⁴ <http://www.iocb-tto.cz/>

We enquired first with researchers whether patenting would be a relevant activity for the research group they are working in and also with deans/directors whether patenting would be relevant for the research institution they are heading. Depending on the research disciplines and technology fields, it is clear that while patenting may be relevant for one institution or research group it may be less or even completely irrelevant for others.

Of the 553 respondents to this question in the researcher survey overall, 46% answered with 'yes', i.e., acknowledged relevance of patenting in their research group. The respective share for deans amounted to 56 % (with of a total of 62 deans answering this question). The higher share with directors is easily attributable to the management function – not every researcher involved in a research group/organization is exposed to IPR issues, even if the research group and/or organization as whole may be.

The differences across research fields are portrayed in Figure 14 for the researcher survey. The exposure to patenting is as low as 0% of the respective researcher base (in the humanities and social sciences), increases to 24% in economics and business and reaches at most 62% (biosciences) and industry/engineering (71%). For the economics and business field, we interpret the share of researchers exposed to patenting more in terms of dealing with patents as research subject than with actually filing patent applications. The medium level rating of the ICT research fields (42%), which may be surprising to some, is likely due to the fact that while hardware developments are patentable, software usually is not.²⁵ In the following we will use the share of researchers for which patenting is relevant as a break-down or 'flagging' variable.

Figure 14 Share of researchers in % for which patenting is a relevant activity in their research group, by research discipline



Source: researcher survey, n = 553

In a next step, we asked researchers and deans about their level of agreement with a number of statements pertaining to technology transfer. The five-tier scale used ranges from 1='do not agree at all' to 5='agree to a large extent'. As Figure 15 indicates,

²⁵ Software is usually subject to copyright regulations. Hence, IPR plays an important role for this research field even if patents are less relevant. Software 'as such' is not patentable. There is, however, a grey zone in which software being part of a hardware (hence fulfilling a 'technicity' criterion) may be nonetheless patentable. These so-called 'software patents' are a subject of frequent dispute, especially concerning the U.S. where the patentability criteria for such software patents are less stringent than in Europe.

IPR regulations at the research organisations are, surprisingly, not considered to effectively hinder technology transfer. This is also true for the incentive structures which are barriers, on average, of 'limited' to 'moderate' extent.

Major problem areas are, by contrast and according to the respondents, more related to industry – i.e. finding appropriate partners in industry, unrealistic expectations of industry and lack of demand on the side of industry. It is especially researchers in the CAS who complain about difficulties finding appropriate research partners (average agreement level 4.1). Interesting to note is that directors deem the barriers enquired, on average, as slightly less relevant than the researchers though they follow the general pattern.

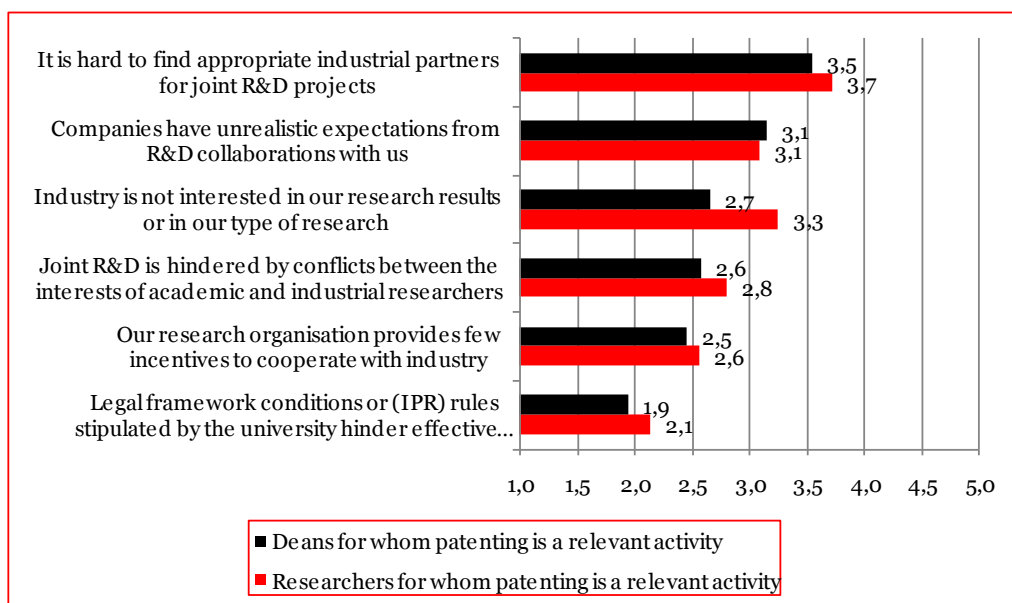
These figures are, on one hand, in line with other recent dedicated surveys on technology transfer. In a study performed by Csank et al.²⁶, low demand from industry has been discussed in the context of science-industry technology transfer in the South Moravian region. One major result was that demand for technology transfer stemmed to a large proportion from subsidiaries of foreign multinational firms, but such firms would only be interested in certain services and not in larger-scale R&D. In such an environment with low absorptive capacities in industry it may be indeed hard to find a viable partner for commercialisation. This even more as a usual success factor in technology transfer is the network of the researchers with industry:

“One key success factor for technology transfer and the institutional arrangements is that it is the networks of researchers that counts...it is the researchers who have to go out there to respective conferences and fairs also with the mission to attract industry partners, because it is them who know (or should know) their fields and potential users of their research best...this requires special IPR training as these researchers have to ensure to divulge enough information to interested parties, but not too much to lay the secrets open and/or forego the possibility of patent later on...” (expert interview).

Absent the absorptive capacity of industry, there is not much networking to be done by the researchers. And it stands to question, whether the researcher's (time) resources are sufficient – without negative consequences for actually conducting research and teaching at home – to explore networking opportunities with firms abroad adequately. On the other hand, though, we have heard also from experts *“...that many researchers prefer to stay in their 'ivory' research environment and would never get the idea of going out and finding appropriate partners for application of their R&D results”*. (expert interview).

²⁶ Csank, P., *Final Report – Field research of public R&D teams in the South Moravian Region*, 2010

Figure 15 Level of agreement with statements referring to technology transfer, deans and researchers for whom patenting is a relevant activity *)



*) arithmetic means on a scale from 1=do not agree at all to 5=agree to a very large extent

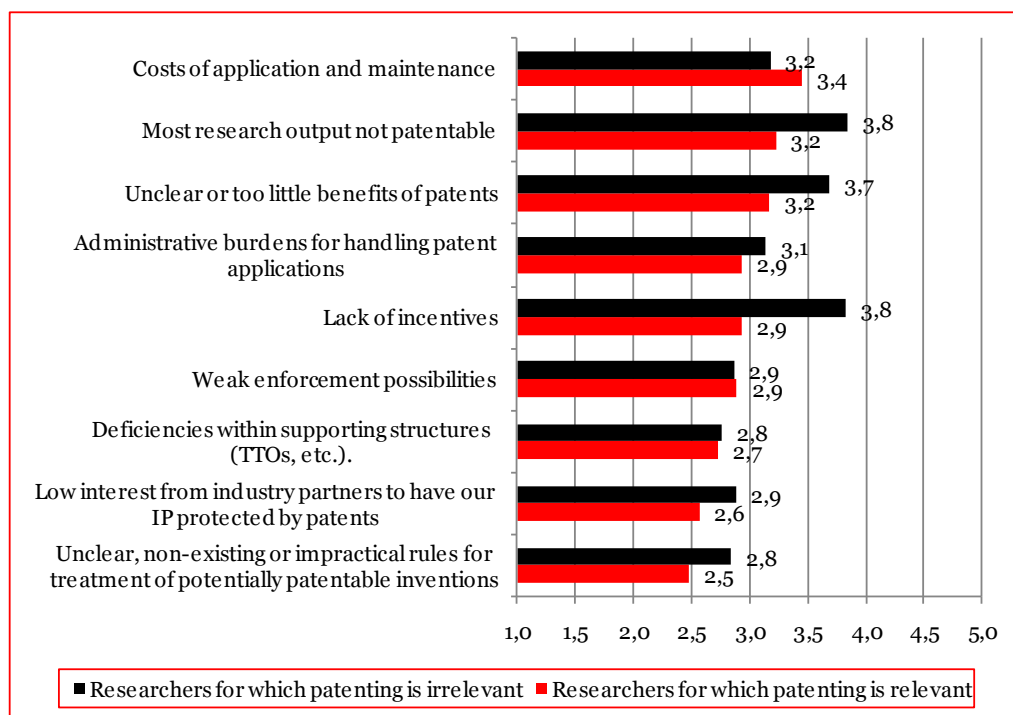
Source: researcher and director survey, n (researchers) = 485, n (deans) = 34

Overall, these results indicate that IPR issues may be a secondary problem for commercialisation of R&D in the Czech Republic. It is a secondary problem in the sense of not coming to discussing IPR issues: The technology transfer process might stop well before the point where IPR is put on the negotiation table.

Becoming more specific, we enquired into barriers to patenting. The results are presented in Figure 16. The respective answer categories/barriers had to be rated using a five-tier scale from 1='no importance' to 6='high importance'. As can be expected, researchers for whom patenting is not a relevant activity in their research group saw the factors 'most research output is not patentable' (average rating: 3.8), lack of incentives (3.8) and unclear or too little benefits of patents (3.7) as the most relevant barriers. These ratings correspond on average to barriers of 'high importance' on our five-tier scale.

Among researchers for whom patenting is relevant, the cost barrier was the most pronounced hindrance (average rating: 3.4), followed by non-patentability of most of the research results and unclear or too little benefits of patents (3.2, respectively). The overall picture is that most barriers are of 'moderate' importance: especially administrative burdens, lack of incentives, weak enforcement possibilities (each rated with, on average, 2.9). There is no overly pronounced dissatisfaction with supporting structures such as TTOs (average rating: 2.7). Even less so, industry pressure (industry being against R&D organisations patenting their R&D) may be considered a rather low barrier to patent, at least according to the researchers. Ranking last are the provisions at the research organisations for the handling of potentially patentable inventions.

Figure 16 Barriers for higher usage of patents as seen by researchers, by relevance of patenting activity



Source: researcher survey, n (patent-relevant group) = 207, n (patent-irrelevant group) = 91

Break downs according to type of research organisations also limited to those for whom patenting is relevant– show that university researchers rate the barriers on average slightly more severe than their counterparts in the CAS and other research institutes. In the case of the CAS, it is especially the aspect of the provisions relating to the treatment of potentially patentable inventions that are perceived considerably less as a hindrance than with university researchers (average rating of 2.1 vs. 2.9 given by university researchers). Also, the CAS rated the supporting structures better than their university counterparts (2.6 average rating as barrier compared to 2.9 for universities), had less issues with industry partners (2.3 vs. 2.9) and with administrative burdens for patenting (2.7 vs. 3.2).

2.3.4 Assessment by experts and conclusions

As in the case of industry responses, the survey results of researchers and deans have to be put into the context of qualitative findings of IP experts. And just like in the case of industry, for the interviewed IP experts low awareness on IPR in academia considered or incentive systems are by far more important barriers than the results of the surveys would suggest.

Putting all research results (statistics on IPR filings, survey, interviews) together the following key barriers to higher patenting and IPR-related activities emerge:

- *Incentive system and preference to publish correlates with low awareness:* There is an inherent preference of research institutions prefer to present their results in the form of publications in respected journals over patenting. This is faster and there are low administrative and financial burdens. Publications are acknowledged in the scientific community and contribute more to professional career development. This correlates also with low awareness of researchers on IPR.

- *Low incentives for patenting and other IPR stemming from formal arrangements:* The formal incentive structures in place in the Czech Republic constitute, despite the efforts to push IPR, a barrier for they are output oriented (not value oriented) and provide little incentives for researchers and research institutions ‘to make money’.
- *Non-interest at executive level of universities and CAS:* There is a lack of interest to invest in IPR and patents at the executive level. This is the result, on one hand and according to the interviewed experts, of low awareness and knowledge. But it may be also an issue related to timing: *“Academic officials are not interested. They are elected for four year terms. They need quick success. Patenting is a long-term process with some risks for the outcome – the time frames just do not add up”*. This may be in particular a barrier for Czech patents which requires use of the patent. Low interest at executive level means also little downward push to increase the incentives of researchers to invest in IPR.
- *Low industry demand and absorptive capacity:* There is low demand from companies for cooperation. A consequence is also that researchers are not confronted with industry needs which adds also to little experience and know-how with industrial applicability.
- *Performance of technology transfer offices:* The performance of technology transfer offices (TTOs) is said to be improvable. We will treat this issue later in section 3.4.

3. The institutional set-up in the field of IPR

3.1 Legislative framework

We enquired with our IP professionals on the status of legislation on IPR in the Czech Republic and whether there are specific weaknesses or issues that need to be addressed. The overall assessment was that the legislative system has no issue to speak of, that is at least none that would have merited special mentioning in our interviews.

The following points emerged in particular:

- The Czech Republic is signatory to all relevant major international treaties on IPR which define minimum standards for IPR protection and enforcement. These include in particular the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) administered by the World Trade Organization (WTO), the European Patent Convention (EPC, since July 2002) and various treaties administered by the World Intellectual Property Organisation (WIPO) to which the Czech Republic is also member.
- Czech national legislation on IPR is said to be fully in line with international obligations and ‘modern’ standards. A notable particularity is given by the fact that the Czech Republic is among those nations that provide utility model protection. The maximum term of utility model protection in the Czech Republic is 10 years. Notable is furthermore the young age of membership of the Czech Republic to some treaties, in particular the EPC.

The following figure lists the major national pieces of Czech legislation in the field of IPR. English translations are centrally accessible for most of these texts on the website of the Czech Industrial Property Office.

Figure 17 Major pieces of national IPR legislation in force in the Czech Republic, as of January 2011

Nr,	Legislation (Codes)
1	Act No. 14/1993 Coll., on Measures concerning the Industrial Property
2	Act No. 441/2003 Coll., on Trademarks, in force from April 1, 2004
3	Act No. 221/2006 Coll., on Enforcement of Industrial Property Rights
4	Act No. 452/2001 Coll., on the Protection of Designations of Origin and Geographical Indications and on the Amendment to the Act on Consumer Protection
5	Act No. 527/1990 Coll., on Inventions and Rationalisation Proposals
6	Act No. 206/2000, on the Protection of Biotechnological Inventions and on the Amendment to Act No. 132/1989 of Coll., on the Protection of Rights to New Plant and Animal Varieties, as amended by Act No. 93/1996 of Coll.
7	Act No. 478/1992 Coll., on Utility Models as amended
8	Act No. 207/2000, of the Protection of Industrial Designs and the Amendment to Act No. 527/1990 of Coll., on Inventions, Industrial Designs and Rationalization Proposals, as amended
9	Act No. 529 /1991 Coll., on the Protection of Topographies of Semiconductor Products
10	Act No. 474/2004 Coll. amending Act No. 207/2000 Coll., on Protection of Industrial Designs and amending Act No. 527/1990 Coll., on Inventions, Industrial Designs and Innovation Proposals, in the wording of later regulations
11	Zákon č. 375/2007 Sb., kterým se mění zákon č. 452/2001 Sb., o ochraně označení původu a zeměpisných označení a o změně zákona o ochraně spotřebitele, ve znění pozdějších předpisů
12	Act No. 378/2007 on Pharmaceuticals and on Amendments to Some Related Acts (the Act on Pharmaceuticals)

Source: IPO CR

Besides our interviews, and respective positive reviews of the European Commission performed before the Czech Republic's EU accession, there is also another indicator which could be used to assess the level of compliance of Czech legislation with international standards: The 'Special 301' report by the Office of the U.S. Trade Representative (USTR) is a yearly report which blacklists countries that, in the eyes of the U.S. authorities, have weaknesses in the field of IPR enforcement and underlying IPR legislation. While it can be debated whether the U.S position is a 'true' indicator of how things should look like in IP legislation, it nonetheless can be regarded a proxy on potentially debatable issues in the legal IPR framework both in terms of design and implementation.

In the 2009 edition of the 'Special 301' report, the Czech Republic was placed on the watchlist (there are two watchlists: the priority watch list and the 'less critical' normal watchlist). The U.S. Authorities were in particular concerned about "...the significant quantity of pirated and counterfeit goods sold in retail markets on the Czech Republic's borders with Germany and Austria, particularly as some of these markets are located on government-owned property."²⁷ With the adoption of an IPR Action Plan in the field of enforcement, and the enactment of a criminal law with higher sentences for IPR crimes at the beginning of 2010, the Czech Republic was removed from the watchlist in the 2010 edition of the 'Special 301' report. To compare: The 2010 edition has Canada on the priority watch list, and Finland, Greece and Italy on the regular watchlist.

²⁷ Office of the United States Trade Representative, 2009 Special 301 Report, April 30, 2009

It is interesting to take note of the stances of some of our interviewees towards the role of the legal system. For them it is not so much the legal framework that counts but its application by the various institutions:

“Most countries, even the less developed ones, have good IPR legislation in place. Two things make a difference: First, the amount of resources available to authorities involved with IPR. They determine the quality of support provided, the extent to which quality examinations can take place and the extent to which enforcement is successful. Secondly, it is the adoption of the system by key user groups and institutions...it has a pre-requisite wide-spread awareness of IPR...from the outside, the difference is visible in the level of interaction on IPR issues among the institutions, and the reliability and responsiveness of the system....in less developed systems it will take long to obtain decisions on IPR, IPR know-how is concentrated with few people and if these people leave this institution the know-how goes with them...” (IP expert interviewed)

3.2 Institutions and IPR service providers in place

3.2.1 Overview

In this section, we describe the institutions and support structures in place in the Czech Republic in the field of IPR, whose aim is – explicitly or implicitly – to support businesses (in particular SMEs) and other interested parties with the qualified usage of IPR. We take an institutional approach and distinguish between privately funded and (at least partially) publicly funded services and service providers. We only look at services made available at Czech national or regional level – services which are available Europe-wide (mainly the IPR Helpdesk of the European Commission, the Enterprise Europe Network (EEN) with its offerings concerning matchmaking events and databases for technology transfer, or the offerings of the EPO) are not described.

3.2.2 Public institutions and their service offerings

The following publicly funded service providers were identified:²⁸

- The Czech Industrial Property Office (IPO CR)
- The system of patent libraries
- Czech Invest
- South Moravian Innovation Centre

The Czech IPO

The main and central publicly funded support structure in place in the field of IPR is the Industrial Property Office of the Czech Republic (IPO CR) which is located in Prague. Taking the responsibility of a national patent office, primary tasks are the handling of industrial property, i.e. examining and granting of patent applications, registration of utility models, handling of industrial designs, of trademarks and of geographical indications. Moreover, the Czech IPO is also active in international negotiations on IP issues and is contributing to the development of IPR policies.

²⁸ We considered only those institutions for which IPR is not at the very margin of their activities.

What is interesting in the context of this study are the range of services that extend beyond the traditional granting and examination processes of a patent office and provide direct support in dealing with IP issues. These 'value added' services of the IPO CR can be categorised as follows:

- Search services
- Educational and publishing activities

Search services denote a group of services that provide support for researching IPR, and here especially patent databases.

Figure 18 describes the search services offered by the IPO CR. Patent family searches and document legal status searches are billed at fixed prices (CZK 500 and CZK 200, respectively). Other searches based on the access to international databases are billed at variable rates: a price for the connection per minute (CZK 30), a price for the work of IPO staff (CZK 400 per hour) and the access price to the respective database. Trademark and industrial design searches have their own pricing models. The processing of the searches takes one to four weeks, depending on the degree of difficulty involved. There is, however, also the option of ordering some of the searches 'express' for an extra fee.

Figure 18 Search services offered by the Czech Industrial Property Office

Nr.	Service	Description
Physical facilities		
1	Physical reading room facilities	IPO CR has a reading room which interested can visit to browse and borrow patent documents and specifications. The operation is similar to that of a traditional library.
Searches performed by IPO CR staff by request of customers		
2	Document legal status searches	Searches to answer the question whether a document is still valid or whether validity has ended
3	Patent family searches	Searches with the aim to identify patent specifications concerning the same invention, applicant and author in various countries
4	Name searches	Searches for the documents of a specific author or applicant/owner of industrial rights
5	State of the art searches	Searches to ascertain the 'prior art' in a specific area of interest (i.e., examining what is already patented or publicly known and hence constitutes non-patentable 'state of the art')
6	Searches for textual, figurative and combined trademarks	International searches in trademark databases
7	Searches for the external appearance of a product	Searches in industrial design databases
8	Copying	This service refers to the possibility to obtain copies of patent specifications (also according to a written order).
9	Monitoring the state of the art for selected areas of technology	This service provides the possibility to regularly monitor new patenting activities in defined technology fields (to be defined by the user) and have the results regularly sent to the customer

Source: IPO CR, *The Informative and Educational activities of the Industrial Property Office*, 11/2005 and IPO CR, *Services for Public in the area of Industrial Property Information*

Concerning the educational activities, IPO CR has established an Industrial Property Training Institute which is an education and publishing organisation. Its most pronounced activity is the offering of a two-year study programme (with two-day trainings lessons which take place once a month). This course ends with the students writing a thesis and taking an oral examination. Graduates will not be patent attorneys, but the exams undertaken will earn credit points towards a patent agent examination. The working environment envisaged for those who take this course is likely to be in patent information departments or at patent attorney offices. Apart from this dedicated course, smaller scale trainings and post-graduate seminars are offered.

IPO CR also engages in awareness raising activities and, to this end, publishes a number of information brochures and leaflets on the various IPR instruments. Furthermore, IPO CR also publishes the specialist magazine 'Industrial Property' and participates at fairs and exhibitions

IPO CR also has implemented, up till now with limited success, the IP Prédiagnosis scheme developed by the French patent office. The Czech 'IPDiagnosis' aims to provide a free assessment of the state of IP (a first IP audit) for an interested SME.

Apart from the Czech IPO, the other notable support structure is the network of **patent libraries**. Patent libraries exist throughout Europe and are some of the oldest support structures in the field of IPR (in Germany they partly date back to late 19th century). The traditional field of activity is the provision of reading room facilities for patent documents at regional level. The rationale is that interested parties should not need to visit the central patent office for information queries. In times of electronic databases accessible via internet this traditional function has been increasingly challenged, and the pressure for these libraries and centres to provide additional 'value added' has increased accordingly.

Figure 19 lists the respective patent libraries in the Czech Republic.

Figure 19 Patent libraries in the Czech Republic

Nr.	Location	
1	Brno	PATLIB CENTRE BRNO at the Moravian Library
2	Hradec Kralove	PATLIB CENTRE HRADEC KRALOVE ARID o.s.
3	Hradec Kralove	PATLIB CENTRE HRADEC KRALOVE at the Research Library in Hradec Králové
4	Olomouc	PATLIB CENTRE OLOMOUC at the the Research Library in Olomouc
5	Ostrava	PATLIB CENTRE OSTRAVA at the Moravian-Silesian Research Library
6	Pardubice	PATLIB CENTRE PARDUBICE at the Regional Chamber of Commerce
7	Plzen	PATLIB CENTRE PLZEN at the Education and Research Library of Pilsener Region
8	Prague	PATLIB CENTRE PRAGUE I.P. EURO,s.r.o.
9	Prague	INSTITUTE OF INDUSTRIAL PROPERTY PROTECTION at the Metropolitan University Prague
10	Usti nad Labem	PATLIB CENTRE USTI NAD LABEM at the North Bohemian Research Library

Source: EPO

The **CzechInvest agency** is offering financial support for the filing of industrial property rights. The respective programme draws on the Structural Funds for 2007 to 2013. In particular, in the course of the operational programme enterprise and

innovation which co-finances business projects in the manufacturing industry and related services that are implemented in the Czech Republic outside the city of Prague, eligible project cost can cover also filings of industrial property. At the end of 2010, there have been 492 applications for IPR protection subsidised and 204 IP titles were already awarded.

The **South Moravian Innovation Centre** established a patent and licensing fund in 2006. SMEs and private persons may receive up to CZK 400,000 as a loan, payable within five years of application for funding. The loan can cover up to 8% of all costs related to the registration of a patent or utility model. Furthermore, in the funding period beneficiaries are assigned a consultant on IP with whom it is possible to discuss issues related to patenting, but also with respect to finding business partners for the protected technologies or for discussing business strategies overall.

3.2.3 Private institutions

Support in the field of IPR by the private sector is usually, in all countries, primarily offered by patent attorneys/agents and, to a lesser degree, by attorneys at law. Patent attorneys are not lawyers in the sense that they have completed studies of law. Rather, they are required to be scientists or engineers by origin and have to undergo additional (legal) education to become patent attorneys.

There is a distinction to be made between European patent attorneys and national (e.g., Czech) patent attorneys. The former are allowed to represent their clients vis-à-vis the EPO, whereas the national patent attorneys are only allowed to represent in front of their national IP offices and courts. In order to become a European patent attorney, it is necessary to pass a respective examination. Some countries (e.g., Switzerland, but also the Czech Republic) did not follow this distinct qualification procedure for European patent attorneys in the past. In these countries it was possible to be also a European patent attorney for example by simple declaration.

In order to provide a transition phase, a so-called ‘grandfather’ rule was established in the Czech Republic. By that rule, patent attorneys who were allowed to act as European patent attorneys in the past may continue to offer their services also in the future. New European patent attorneys, however, have to undergo the examination and education required by the EPO.

According to the Czech chamber of patent agents, there are currently 223 patent attorneys registered and hence allowed to practice. 116 of these are also authorised European patent attorneys (including also those that benefit from the ‘grandfather’ rule).

3.3 IPR support services in other countries

In this section, we take a look at three support systems in the field of IPR, with a focus on SME and industry support, in place in other countries: Hungary (selected for similar size and stage of economic development), Austria (for similar size and more advanced economic development) and Switzerland (to contrast the Austrian example).

3.3.1 Hungary

In Hungary just like in the Czech Republic, the Hungarian Patent Office (HPO) can be considered the main public body offering and coordinating IPR-related support, especially when it comes to SMEs. In particular, it operates the programme ‘VIVACE+’ (which stands for: ‘Action Plan Promoting Industrial Property Competitiveness of Entrepreneurs’) with SMEs as the sole target group. Its aim is to build networks and services, to foster awareness and expand education and to provide support (i.e., consulting) for SMEs using the IP system. VIVACE+ may be considered as an umbrella programme for most of the IP-related public services developed in Hungary and involves many other publicly funded Hungarian bodies (i.e., the National Office for Research and Technology) also active in providing IPR support to small

companies. Apart from VIVACE, the office also provides search services in IPR databases.

Other important service providers comprise:

- At national level, (first-time) consultancy and advice services in the field of IPR are offered by the Federation of Technical and Scientific Societies (MTESZ), the 'SEED' Foundation for Small Enterprise Economic Development, the Hungarian Association for Innovation or the incubator programme INNOSTART. The National Office for Research and Technology (NKTH), within the framework of the programme INNOCSEKK PLUSZ ('Innochcheque Plus'), subsidises patent database research services and IPR related consultancy services related to domestic patent filings and various types of innovation projects.
- At regional level, a system of six patent libraries has been established just like in the Czech Republic, but with direct institutional affiliation with universities. Besides these libraries, smaller IPR information points were set up at regional chambers of commerce. These nine points offer basic awareness raising and referral services. An equivalent offering to those of the chambers is also provided by six regional innovation agencies. Nine technology transfer offices of universities have been established, in many instances as 'integrated offerings' with a PATLIB function. For all services, VIVAVE is instrumental for coordinating the activities of the service providers.

Conclusion

The Hungarian services portfolio seems to be very comprehensive and impresses especially with the VIVACE umbrella programme and the dense network of regional information and consultancy points coordinated by VIVACE.

However, maintaining a strong commitment by all partners is seen as a challenge, and there are indications which point to a heterogeneous quality level between the services provided in the regions, depending on the persons operating each service (this despite the efforts of the HPO to have a certain standard in each regional outlet). Nonetheless, basic IP awareness raising services and information material seem to be available, and the basic infrastructure and organisational set-ups are in place. Performance of service delivery – while hard to gauge in the course of this analysis – is generally considered as improving, notwithstanding the earlier statement of quality variations across regions and service providers.

Currently, there are efforts to introduce an IP Prédiagnosis scheme in Hungary; without such a scheme – and apart from very basic awareness raising measures and counselling – the support service system seems to be rather patent-focused. Measures for copyright-related industries are hardly visible. Notwithstanding this observation, the support service system seems to be well developed, with on-going national coordination. One most likely challenge is to have sufficient endowment of resources in order to secure constantly good performance. However, the endowment of resources might also constitute a constraint for the sustainable deployment of new and more demanding, expert know-how and hence cost-intensive services.

3.3.2 Austria

In Austria, there is a dense network of offerings in the field of IPR support offered both at national and regional level. Compared to other countries, the national patent offices play, however, less of a role: Main support programmes and service are on offer by the central funding bank aws (Austria Wirtschafts Service).

In particular, the following services are offered:

- At national level, the department 'patent and licensing' at the Federal funding bank aws stands out as service provider. It operates a number of programmes: 'IPP' (Innovation Protection Programme) provides grants and advice for IP

enforcement abroad, especially in China. 'Tecma' is a service aiming to assist research organisations in commercialising their inventions, e.g. by looking for commercialisation partners. Up until the end of 2010, the state-funded programme 'uni:invent' offered a centrally-run portfolio of services to universities which are otherwise typical for a TTO. The funding has been discontinued, but the services are still available to interested universities who need to pay for them now.

Besides aws, the national patent office offers a range of search services (which it markets as distinct products with different terms of payment and delivery) and training. aws and the patent office have recently together adopted the programme 'discover.IP', the Austrian version of the French IP Prédiagnosis programme.

There are also other initiatives which focus on specific fields: For example, the Austrian Federal Chamber of Commerce runs a programme for the Creative Industries, with two offerings specifically aimed at IPR, or more specifically, copyrights: a depot for files in order to prove the creation dates of works and, secondly, information material for awareness raising.

To note is also that Austria has installed a National Contact Point in the form of a person responsible for monitoring the implementation of the 'IP Code of Practice' of the European Commission. The NCP has organised a series of workshops with key-holders for this purpose.

- At regional level, service offerings of larger regional innovation agencies and chambers of commerce stand out. The main offering is the organisation of open consultation days with patent attorneys one time a month in each of the regional provinces. In this offering, patent attorneys provide first-time consultancy for free to interested SMEs. Further activities at regional level include patent information search services (though not in every province). However, these offerings are not recognised as PATLIBs by the EPO. The only PATLIB in Austria is the national patent office itself. As concerns technology transfer, several regional agencies provide for programmes that should assist in finding research partners for firms.

Conclusion

The Austrian portfolio of IPR support services is among the larger ones in Europe, involving a considerable number of services both at the national and the regional level. While especially at regional level services tend to focus on patents with the provision of open consultation days and patent information search offerings, at the national level recent offerings attempt to go beyond that. This refers especially to the discover.ip service, but also the IP services for the Creative Industries provided by the Austrian chamber of commerce. By having discover.ip jointly operated with the Austrian Patent Office, this service is one of the very few throughout Europe that exhibits this important (from a systems point of view) element of good practice.

However, many of the new offerings are so young that experience must build up to actually assess the effectiveness and performance of the measures. Also, it stands to question whether collaborative and coordinative efforts (e.g., between the patent office and aws, but also involving other actors) may be improvable, and also the effectiveness and performance of many of the measures (especially regionally) is to be scrutinised.

3.3.3 Switzerland

Though of similar size to Austria, Switzerland's approach to IPR support is in many ways fundamentally different. The prevailing rationale is to keep state intervention in markets as low as possible, so to speak, at the absolute minimum.

This approach is also reflected in the level of IPR support. The central player here is the Swiss Federal Institute of Intellectual Property (IPI). IPI is similar to the Czech IPO in the way that it is also directly sub-ordinated to government and covers a major portfolio of activities related to IPR. By contrast to the Czech IPO, it is also responsible

for copyrights. Besides the IPI, the Swiss Commission for Technology and Innovation CTI provides also for IP support in the area of high-tech start-up support.

The following services stand out:

- The IPI offers subsidised and personalised introductory training on patent searches at the premises of the IPI. The so-called ‘accompanied patent searches’ last around half a day. Other than that, the IPI offers information and awareness raising material. Especially as an outcome of a recent comprehensive review, a new website has been launched for SMEs. IPI also engages in training. Other services, especially in the field of patent information searches, are offered on the market at market prices.
- CTI has embedded IPR support in the course of support programmes aimed at high-tech businesses: ‘venturelab’ is a series of workshops for start-up firms, with some of the workshops aiming also at IPR. Within the second programme, ‘CTI start-up’ which accompanies high-tech start-ups in their early phases and provides a certification badge at the end, external IP experts are subcontracted as ‘IP Coaches’ and provide respective counselling and reviewing for the firms.

Regional support structures are mainly active as referral points to IP professionals and the Federal offerings. In fact, most of the support in the field of IPR is provided by private parties (IP consultancy firms and patent attorney practices).

Conclusion

The overall assessment is that while the number of support programmes is low, Switzerland excels in implementing those services which it considers absolutely necessary to be offered by the state. A key challenge is nonetheless the visibility and acceptance of the Swiss IPI as viable service provider in the Swiss innovation system.

3.3.4 General assessment

The international examples have shown interesting instances from which the Czech Republic can learn: Coordination of activities among key stakeholders (Hungary), collaboration between patent offices and other agencies in the field of innovation support (Austria, discover.IP) or the embedding of IP services in other programmes (Switzerland).

Despite such elements of good practice, the area of IPR support is one where there are issues visible in all countries. There may be elements of good practice scattered throughout Europe, but it is difficult to spot all elements united in one offering or systemic set-up. Typical problems are that of patent centrality (support focused on increasing patent output) or the isolated acting of patent offices in the innovation systems.

Below, we present a collection of elements of good practice in IPR service design. They are based on a variety of analyses of IPR support programmes, are generic and hence applicable for the design of many different types of support programmes and services.

Figure 20 Generic elements of good practice in IPR service provision to SMEs, non-exhaustive, as identified in past studies

Nr.	Element of good practice	Rationale
1	Competence of staff	IPR is considered a rather complicated topic. Successful advice is to consider legal issues, technical issues and business/management issues (the latter also industry specific). IPR know-how should ideally cover all form of IP protection. Not the least, due to lack of educational offerings in the tertiary sector, such expertise is scarce and thus a bottleneck aspect for IP service providers.
2	Integrated package instead of isolated	Services where several IP services are offered out of one hand usually perform better than ‘stand-alone’ offerings because they realise

Nr.	Element of good practice	Rationale
	offerings, with an adequate number of staff	synergies of expertise (through the pooling of experts) easier. In this context, it also important to mention the issue of critical mass. An integrated service can also achieve such mass (i.e., a sufficient number of staff with different skills, forming an 'integrated' pool of expertise) easier.
3	Preference for nation-wide offerings	A nation-wide offering is usually preferable, especially for more in-depth going services, because it is easier to pool the scarce expertise centrally and achieve thus the critical mass of expertise for integrated packages. Also, the nation-wide offering can also be conceived in order to avoid fragmentation of IPR support.
4	Regional offerings for basic IP services and signposting	Regional support services are helpful in reaching out especially to 'IP beginners' among the SMEs as they provide some first consulting and may refer to external experts (e.g., those from the central unit which have pooled the in-depth IP expertise or IP professionals from the private sector); they are hence good multipliers also for nation-wide services. However, more advanced SMEs are shown to be willing to travel longer distances if they receive the information they need which limits the necessity of having 'fully grown' support services at regional level
5	Coverage of the full spectrum of IP instruments	Most services in Europe tend to focus on patents. The important interplay between patenting and other forms of IP protection is frequently not touched upon with the consequence that 1) in some (perhaps few) cases SMEs would get bad advice when going for patents and 2) that other types of IPR and especially informal protection strategies are not tackled at all. Hence, there is a need for services (or service systems) that cover the full spectrum of IP instruments.
6	Visibility	In order to reach out to a reasonable customer base, the service has to be known by SMEs. This seems to be particularly a problem for patent offices which are relatively new as service providers for SMEs in the innovation system and usually not the primary institutions firms would look for advice for business-related issues. A reasonable solution is extended collaboration with institutions close to the desired customer base (see also next point).
7	Networking and collaboration between patent offices and development/innovation agencies	i) Relatively poor visibility, ii) the fact that most IP services are offered by national patent offices as well iii) the need of IP management to be an integral part of innovation management call for this element of good practice. Collaboration between patent offices and agencies allows service provision on innovation at least seemingly out of one hand and not from different non-connected sources. Collaboration also allows for mutual synergy creation between the experiences of agencies and patent offices. It may also remedy the visibility problem of patent offices through the then possible access to the user base of the agencies.
8	Clear demarcation lines and collaboration with the private sector	As current thinking would allow state intervention only in cases of market failure, care must be taken not to produce unwanted crowding-out effects among private service providers such as patent attorneys or firms offering patent information search services. The experience of some services have shown that consultation with the private sector during the establishment and operation of measures may help mitigate this danger, and may even lead to 'win-win' situations for both sides.
9	High effectiveness of 1:1 approaches	As IPR is a very business-specific issues, services which incorporate company-specific (1:1) consulting aspects are frequently very effective. This should, however, not be interpreted that services which do not follow a 1:1 approach are superfluous or in-effective (i.e., the inversion of the argument is not necessarily true). Quite to the contrary, single tools and services might be used in 1:1 consulting to provide a particular service aspect in a more effective/efficient way.
10	Evaluation culture	Many of the support service analysed in the past have not been subject to monitoring and/or evaluation. This has negative consequences both in terms of accountability to the bodies providing funds, as also in terms of knowledge of the specific needs of the customer base.

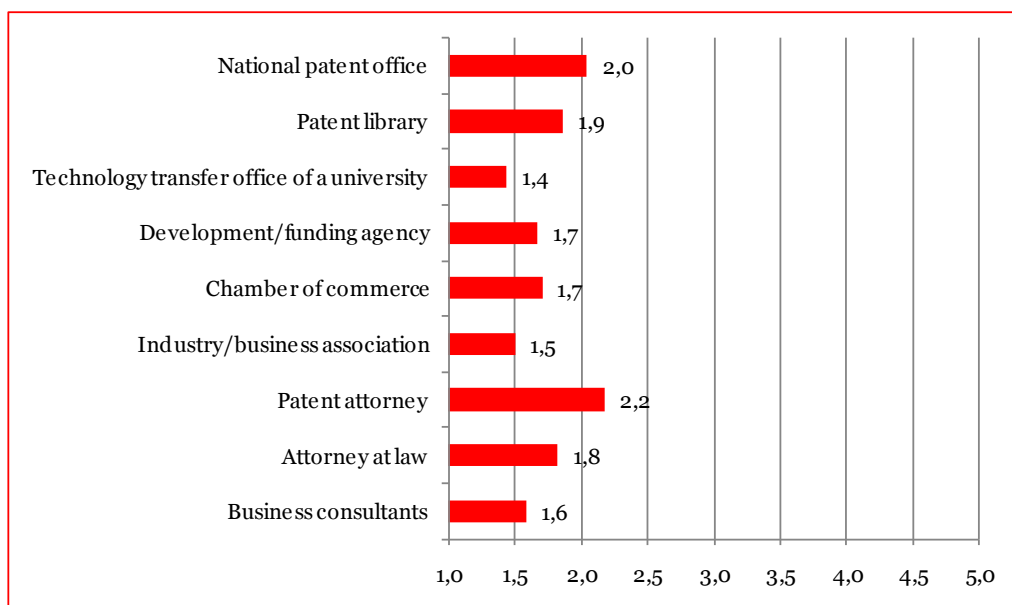
Sources: Radauer, A., *IPR for SEE - Analysis and development of IPR support services in South Eastern Europe*, 2010.

3.4 Assessment of the level of support provided to key actors of the Czech innovation system

In this chapter, we assess the level of usage of the various types of IPR service providers in the Czech Republic by industry and, to a lesser degree, by universities and research organisations.

In order to assess the relevance of different types of IPR service providers to Czech firms, we enquired into the frequency of usage of such providers by businesses for IPR questions. We drew on a five tier scale from 1='never' to 5='always'. The overall results are displayed in Figure 21. We find that overall the frequency of drawing on external support is fairly low. The relatively highest average usage frequencies are those for patent attorneys (average frequency of 2.2, corresponding roughly to the scale labelling 'rarely', and that of the national patent office (average frequency: 2.0). Interestingly – for the relatively low valuation of this type of service provider (see later on) – patent libraries rank third. The figure indicates that many types of service providers (such as technology transfer offices at universities or, more importantly, industry/business associations), are almost never contacted. This can imply both that questions of IPR seldomly occur and/or if they occur that issues are primarily handled without external support.

Figure 21 Frequency of usage of different types of service providers for IPR problems by industry *)



*) arithmetic means on a five-tier scale from 1='never' to 5='always'

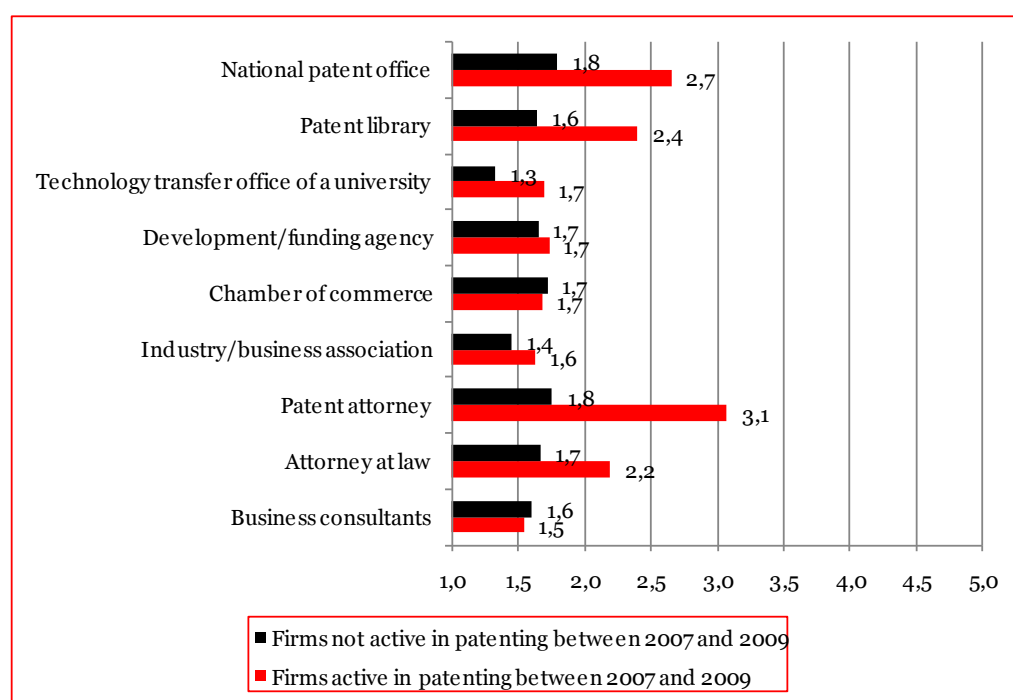
Source: industry survey, n = 87.

A break-down of Figure 21 by patenting and non-patenting firms clearly shows that any demand for external support in IPR questions arises primarily from patenting firms. Whereas in the group of patenting firms the usage of service providers such as patent attorneys (average frequency: 3.1 or 'sometimes' on our scale labelings), the patent office (2.7), patent libraries (2.4) and attorneys at law (2.2) increases, usage frequencies in the complementary firm group always stay on average always below 2.0

(the value 2 was labelled in the scale as ‘rarely’ used). This implies that external support may be sought primarily for issues related to patenting.²⁹

A similar picture emerges, if the breakdown is performed according to strategy. Firms with an IPR strategy seek more frequently support with external providers – again primarily patent attorneys, the national patent office and patent libraries – than those without a strategy.

Figure 22 Frequency of usage of different types of service providers for IPR problems by patenting and non-patenting firms *)



*) arithmetic mean on a scale from 1=‘never’ to 5 = ‘always’

Source: industry survey, n (patenting firms) = 26, n (non-patenting firms) = 61

The comparison with other countries (in this case Germany, for which there is comparable quantitative data available³⁰) shows that usage patterns are similar insofar, as the patent attorneys are the most important service provider. However, overall usage frequency is considerably lower in the Czech Republic. A (qualitative) comparison with Eastern European countries (Hungary, Romania)³¹ reveals that like in these countries, the most important publicly funded service providers are the patent office and the network of patent libraries.

Notwithstanding the relative high importance of the patent office and the patent libraries (compared to funding technology/innovation agencies or chambers and business associations), one must acknowledge that overall take-up of publicly funded

²⁹ The structure of R&D-intensive firms may cause a bias if results are extrapolated to Czech industry as a whole, though, as low-tech firms with little R&D activities for which certain IPR tools (e.g., trademarks) are an issue are by and large not included.

³⁰ Blind, K., Cuntz, A., Köhler, F., Radauer, A., *Die volkswirtschaftliche Bedeutung geistigen Eigentums und seine Bedeutung für den Mittelstand (The economic significance of IP and its importance for SMEs)*, Berlin, 2009

³¹ Radauer, Alfred, *IPR for SEE – Analysis and development of IPR support services for SMEs in South Eastern Europe*, Study report for Workpackage 3 of the IPR for SEE project, Vienna, 2010

services is low in absolute terms. This finding is also in line with our qualitative results:

- Interview partners told us about difficulties of the national patent office to get hold of a wider range of firms attending seminars and courses. This despite of well written information and awareness raising material, collaboration support with the EPO and a good opinion of experts on the IPO activities in terms of efforts undertaken. For example, interest in the Czech version of the support scheme IP Prédiagnosis (in the Czech Republic called IPDiagnosis) – a service developed in France and due to its success and the various elements of good practice exported to other countries – was said to be ‘lacklustre’. Some interviewed experts attributed this to the very low awareness of businesses in the Czech Republic on the importance of the topic of IPR.
- Moreover, there was considerable consensus among the interviewed experts that while the Czech IPO has created services comparable to those in Western countries and has also considerable expertise in the field of IPR, that this know-how is hardly accessed and in demand by Czech actors. This refers not only to firms, but, perhaps more importantly, to various kinds of institutional actors in the innovation system: ministries, universities, business associations, chambers of commerce and other types of actors. The pre-dominant view was that awareness of these institutions on the topic of IPR is very low. In fact, our interviews indicated a situation where there may be only a small core group of experts savvy on the topic of IPR. Departing from this core group, know-how levels on IPR tend to decrease steeply – a situation which we have not witnessed in other countries such as Austria or Switzerland, at least not to the same extent.
- In this context, the role of business associations and chambers of commerce deserves special attention. Most of our interview partners agreed that business organisations hardly pay attention to the topic of IPR and lack respective know-how. This situation explains also why the chambers and associations are in such low demand with firms when it comes to the topic of IPR. While this has proven to be an issue also in other countries, the extent of this problem seems to be higher in the Czech Republic. The finding is disappointing insofar as business organisations usually serve as a gateway to firms. They are frequently the first organisations businesses refer to for questions (or listen to, when they are told about important trends and issues in their industries). By collaborating with chambers and business associations, the Czech IPO could have the opportunity to reach out better to firms. This can be achieved, for example, by placing articles in industry newspapers on the topic of IPR. Such an approach is much more promising than having the IPO attempting to mass mail businesses directly: *“For an SME, direct contacting by the Czech IPO may be equivalent to being contacted by an organisation who wants to sell its product which is of no use to the firm”* (expert interview). Having back-up by an industry association lends credibility.
- The system of patent libraries is faced, according to the interviewed experts, as being faced with considerable challenges. As already stated, the traditional function of such libraries to provide a physical facility for regional access to patent documents is deteriorating in times of free online access to patent databases. The repositioning as service providers with ‘added value’ services is hindered by resource constraints. Cases in point are low levels of staffing (sometimes staff is in charge of other duties as general librarians), IPR expertise of the staff or lack of funds. The latter prohibits the libraries, for example, to obtain licenses for commercial patent databases which provide an added value over the free offerings. Perhaps interesting to note is that the problems described are addressed by a cooperation programme of the EPO with the patent libraries and the patent office.
- There was some discussion and discern among the interviewed experts as regards the effectiveness and support provided by the system of Czech patent attorneys. It

is especially the ‘grandfather’ rule for European patent attorneys that was the focal point of discussion. Some experts stated that the number of ‘truly’ qualified patent attorneys is too low, while others regard it as adequate for the current economic development stage of the Czech Republic. This discern was also visible with the firms we interviewed, where we heard at least once explicitly that the supply of European patent attorneys level is low and that the firm reverts to patent lawyer practices abroad (e.g., in Germany). Notwithstanding this observation, we would rather side with those stating that the supply corresponds to actual demand (although such a call is difficult to make, in light of the available evidence). It stands to judgement, given the low number of filings with the EPO, whether a significantly larger number of European patent attorneys would currently find enough business to prosper in the Czech Republic.

- Concerning the current role of TTOs and their IPR supporting function(s) there was considerable agreement on the side of the experts that these institutions face significant challenges, too. The majority of these institutions are young, and the staff operating these TTOs may be rather in-experienced when it comes to IPR. These qualitative findings are also corroborated by the analyses of Vanecek³² and of Csank et al.³³ Csank et al. identified the following barriers to TT development “...insufficient preparedness of internal procedures and TT-related assistance tools...a critical lack of experienced experts in managing and implementing support activities in the area of TT...the relatively low involvement of people with qualities that would favour entrepreneurship” (Csank et al, 2010). It must be noted, however, that considerable efforts are underway to strengthen the TTOs in the coming years.
- The lack of expertise on IPR and adequately trained staff is indeed a bottleneck for the whole innovation system in the Czech Republic, though this is also true for (all) other countries in Europe. A key issue in this context is available training and education at higher educational institutes, especially at technical universities, business schools and law faculties. In this context, it is considered advisable to have introductory courses on IPR which highlight especially the business perspective (IP management) already at undergraduate level. Specialised programmes at post-graduate level to train so-called ‘IP managers’ would complement such offerings. Together, such education should be able to secure adequate awareness on IPR in the innovation system at least in the long term. The situation in the Czech Republic concerning IPR education is somewhat a surprise.

While most experts hinted at possibilities for improvement, there were also voices that stated that IPR offerings are more and more introduced. In this context, it is interesting to note the educational programme of the Metropolitan University in Prague: This university offers bachelor’s degrees in ‘industrial property’, and master’s degrees and PhD studies in ‘international and regional relations in industrial property’. Without prejudice to any quality assessment of the offerings (they are accredited), the introduction of such study programme is not only an innovation for the Czech Republic, but also for the whole of the EU. In fact, the study team is not aware of any similar thorough academic programme in the field of IP at all levels (undergraduate, graduate and post-graduate).

- Against the backdrop of promising developments in IPR education, the long-term prospects are for some of the experts less of an issue:

“The most pressing problem is not at the level of university students and graduates. Their knowledge and awareness on IPR is improving, but

³² Vanecek, J., *Patenting propensity in the Czech Republic*, in: *Scientometrics*, Vol. 75, No. 2., pp. 381–394, 2008

³³ Csank et al., *Final Report – Field research of public R&D teams in the South Moravian Region*, 2010

once they enter the working world they have a hard time getting their ideas through to the management. This is especially an issue for larger state owned Czech firms with closer ties to politics and where managers are replaced in quite short intervals usually with changes of the government.” (expert interview)

In fact, there was overwhelming consensus among the experts that awareness at management level in all types of R&D conducting and supporting institutions is the key issue in the Czech Republic. Having elaborated that IPR is indeed a topic primarily to be treated at management level, we recommend treating this topic with priority.

In order to achieve respective goals it would seem necessary to have some persons responsible at ministry level, and with respective powers and recognition, to drive an IPR agenda (i.e., develop and implement respective IP strategies). The ‘IP Code of Practice’ recommendations would facilitate the establishment of such a person. However, and despite of some efforts, we were not able to identify such a person or department with leadership on this topic (in Austria, there has been a National Contact Point (NCP) for the Code of Practice which regularly .

4. Overall conclusions and recommendations

The overall findings show that formal IPR instruments, in particular patents, are used only at low levels in the Czech Republic. Several factors are contributing to this situation: traditions from communist times, industry structure and stage of economic development are to be named here, but also framework conditions such as the particular design and usage pattern of the European (EPO) patent system which makes IPR to an extent also irrelevant issue for Czech businesses. Of course, barriers such as the costs of IPR and weak enforcement possibilities which are commonly identified as barriers to IPR up-take play a role, too.

The aspect, however, that has provided the most articulated common thread through our enquiries (especially the interviews with IP experts and intermediaries) is that of an overall low awareness on IPR issues in the Czech innovation system. It is in particular the management level of the various institutions of the innovation system where there is necessity to improve IPR know-how. This is to be underlined especially for the university and research sector where our interview partners noted on lack of interest about IPR issues at management level – which of course has implications for the way IPR is handled. As modern research suggests, IPR should be understood as a management topic offering a portfolio of different formal instruments and informal tools whose specific use is to provide ways of doing business, i.e. ‘making money’.

There is seemingly only a small core group of experts savvy in the field of IPR and IP management in the Czech Republic. IPR know-how seems to be deteriorating steeply (more than in other countries) the farther one gets, institution-wise, away from this core group. The implications are manifold: The support services in place and the existing intelligence are hardly in demand. Networking between institutions (such as referral activities or other types of collaboration) is very low, creating additional barriers if successful reach-out to target groups or even the creation/commercialisation of IPR necessitates communication between several types of institutions. Several types of institutions which should provide at least basic referral and information services do not have such offerings, the most prominent being the majority of chambers of commerce and business associations.

Low awareness on IPR and IP management principles gives also rise to ambiguous incentive systems for researchers in the Czech Republic when it comes to valuing IPR. The evaluation methodology of 2010, in interaction with Act No. 211/2009 on the support of research and development (especially if it is interpreted in the direction of state ownership of IPR), is very rigid and output oriented. Without prejudice to other issues of the evaluation methodology, the IPR metrics hardly provide a commercial incentive (in the sense of ‘let’s get rich’) for the primarily involved researchers and research institutions. There are also coherence issues in the way points are distributed among various IP instruments. Supporting structures at the universities and CAS (i.e., TTOs) are for the most part very young and need to climb the learning curve. The non-interest about IPR observed by our experts at executive level has been described already above. A lighthouse example for successful TTO is, however, the Institute of Organic Chemistry and Biochemistry (IOCB).

A non-issue is the legal system which is in line with international treaties and what one may consider ‘state of the art’ IP legislation. Promising (but expandable) are also developments in the educational sector and innovations such as the educational programmes on industrial property at the Metropolitan University Prague. On the positive side, one may also say that the Czech Republic’s IPR performance is among the best in former Eastern European countries (or at least in line with those of other peers of similar stage of economic development).

But new developments such as the possible introduction of a Community Patent and the overall economic development path indicate that the usage of IPR will (have to)

increase accordingly. In order to secure and facilitate higher qualified usage up-take of IPR in the future, it seems necessary to set certain directions in the IPR policy pursued by the Czech Republic.

In any way, discussions observed where academia and industry representatives make each other responsible for low patent filing activities in each other's sector are not warranted. Both sectors have issues of their own to work on.

Against this backdrop, we recommend the following:

- *Foster the creation of awareness in the system:* The main recommendation is to elaborate on activities and policies that aim to increase awareness on IPR and IP issues in the innovation system. Awareness on IPR necessitates knowledge not only legal and technical aspects of IPR, but also on business aspects (IP management issues). We have seen that know-how already exists, e.g. in the Czech IP Office, but we do urge that important institutions should adopt more the role of intelligent customers and increase demand for this expertise, accordingly. The key issue is institutional empowerment and entrenching IPR know how at the management level of organisations such as universities, CAS, chambers of commerce, business associations and ministries. We also recommend further strengthening IP management education at universities at undergraduate, graduate and PhD/post-graduate level.
- *Create personal responsibility on IPR for the innovation system at ministry level (installation of an 'IPR representative'):* While the general thrust should be to increase awareness on IPR in the system, it stands to question whether the needed learning will happen all by itself. In order provide guidance and foster such learning, we recommend installing a person at ministry level who is i) responsible for IPR issues overall and ii) has also the means, power and willingness to pursue an IPR agenda. We are skeptical about writing IP strategies for many such strategies turn out to be only paper work and lead to no implementation. A person committed and in charge can make the difference, however.
- *Define key tasks for the 'IPR representative':* The key tasks of such an 'IPR representative' would be, on the one hand, to improve the networking of the actors of the innovation system on IPR issues and elaborate on activity profiles for them. This can be achieved by organising networking events on specific IPR topics. On the other hand, we recommend the representative to monitor the outcome of IPR filing activities in selected areas from a commercial point of view and provide for respective systemic learning opportunities. Such a monitoring would go beyond the counting of outputs and patent applications and necessitates closer (and also more qualitative) observation and reporting of the IPR commercialisation activities. One such possible selected field would be to closely examine and reflect on the commercial outcome of the IPR filings expected in the course of the 'operational programme research and development for innovation'. The outcome of such activities would be a much better understanding of the role of IPR in the commercialisation process, specific to the situation of the Czech Republic, and a much more fine-tuned design of IP policies, strategies and monitoring systems.
- *Re-consider the role of IPR in the evaluation system of publicly funded R&D and Act No. 211/2009:* In line with the recommendations on the evaluation system in the dedicated report of the Audit on this subject, we recommend, from an IPR point of view, re-considering the role of the IPR for assessing R&D results in various ways. First, utility models undergo no examination process in terms of the technical quality of the applications and are mere registrations of documents. Utility models should hence not be used to assess research output. Secondly, and as for patents, we recommend focusing more on commercial utility derived from patenting, and not the counting of patents. Inconsistencies between the values given to various types of patents should be explored with IP professionals and corrected accordingly. Overall, a much more specific approach is warranted, which

takes account of 'commercial incentives' for the involved researchers and research institutions to introduce inventions onto the market. Against this backdrop, Act. No 211/2009 should be reviewed and any ambiguities in interpreting the law should be removed. The EC's IP Code of Practice provides some good (though at times very general) guide for further implementation of TTO and IP policies, in line with many of the current findings on TT. We therefore recommend considering these recommendations for the further development of evaluation methodologies and for enhancing TT performance in the Czech Republic.

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