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Some Issues of the Estonian Innovation and Intellectual Property Policy[*1]

1. Introduction

The global economic trends characterised as the transformation into a knowledge-based economy have had remarkable implications for entrepreneurs and the society at a larger level. The Estonian business environment is no exception. The main consequences of this transformation are that knowledge is perceived as a valuable commercial asset and innovation has become a core process for value creation within a knowledge-based economy and a means for tackling social and environmental problems. Since protection of intellectual property (IP) constitutes an essential condition for innovation, the transformation has had an impact on the IP system as well. As a result, the enhancement of innovation should be regarded as a central IP system objective. Therefore, the value of an intellectual property system lies in its ability to foster innovation.

In this article, the author analyses some aspects of innovation and intellectual property policy that need to be considered to support innovation in Estonia. For the purpose of this article, innovation policy refers to actions taken to extend and accelerate innovation. Intellectual property policy forms an integral part of innovation policy.

The author suggests that innovation and IP policy is country- and region-specific, which means that almost every country and region has its unique conditions that need to be considered in designing innovation and intellectual property policy measures. The article focuses mostly on some essential aspects of Estonian IP policy.

The paper addresses problems related to IP protection at two levels: the first level concerns state-level IP policy, and the second level of discussion addresses actions that Estonian entrepreneurs may be able to take to enhance their IP competencies and foster innovation.

The author presumes that the profile of Estonian entrepreneurs should be considered in the design of the state-level IP policy. The author suggests that utility models and trade secret protection are very useful IP tools for Estonian entrepreneurs and therefore it would be appropriate to review critically the existing regulations on utility models and trade secrets.

The author recommends that, in addition to state-level IP policy measures, there must be entrepreneurs developing their IP competencies. Entrepreneurs could start with the adoption of internal IP regulations that address issues such as ownership of IP created during employment, strategies for managing IP, and the like.

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2. Interrelation of innovation and intellectual property

The term 'innovation' is derived from the Latin word *innovare*, which means 'to renew'. As a rule, policy documents and legal acts do not provide an exhaustive and universal definition of innovation. For instance, in EU documents, the terms 'innovation' or "innovation in a broad sense"[*2] is used. The Estonian Research and Development and Innovation Strategy[*3] (more simply referred to as the Estonian innovation strategy) describes activities that could be summarised as innovation: "Innovation includes implementation of the latest results of scientific research as well as existing knowledge, skills, and technologies in an innovative manner."[*4] Section 2 of the Organisation of Research and Development Act[*5] defines innovation as "the utilisation of new ideas and knowledge in order to implement innovative solutions". The definitions referred to seem to exclude knowledge creation by means of innovation. The author argues that knowledge production constitutes an integral part of innovation. It is not reasonable to assume that knowledge comes from somewhere else and innovation means only its implementation. For the purpose of this article, the author defines innovation as a process that includes both creation of knowledge and its subsequent utilisation.

Objectives of innovation can be analysed from different perspectives. The most visible and noticeable outcomes of innovation are new products and services. The purpose of innovation, however, is not limited to the creation of commodities. Innovation is also believed to have an impact on the economy. Therefore, it has been suggested that innovation is "one of the most important factors in economic competition".[*6] It is possible to place innovation in an even broader context by arguing that it generates wealth and tackles social and environmental problems. Supporting innovation is seen as a way to surmount challenges (problems related to ageing populations, environmental issues, mounting competition, etc.) facing Europe. At least the European Commission believes so: "innovation in a broad sense is one of the main answers to citizens' material concerns about their future".[*7] Not surprisingly, innovation is sometimes thought to be one of the factors influencing the world's future trends.[*8]

In view of the complexity of the objectives of innovation and the fact that innovation policy can be implemented on different levels (e.g., regional, country, sector, and industry levels), it becomes evident that innovation policy encompasses a variety of components. Therefore, in order to enhance innovation, it is necessary to invest in human capital, improve the legal framework, stimulate business research, facilitate knowledge transfer from academia to industry, etc. Depending on the implementation levels and specific objectives, the role and importance of innovation policy measures vary. However, the author assumes that protection of intellectual property constitutes an essential condition for innovation.

Intellectual property is traditionally defined as legal rights resulting from intellectual activity.[*9] The traditional approach places IP in a legal context. The role of intellectual property, however, has changed. Knowledge as a subject of IP protection has become a valuable commercial asset to many firms, other organisations, and individuals. This development has shifted the emphasis from the legal aspect of IP (that is, IP as legal rights) to its economic aspect (IP as a commercial asset). Consequently, intellectual property is considered rather more as an economic asset than in terms of legal rights. The author argues that the contemporary notion of IP should incorporate both — the economic (IP as an asset) and legal (IP as rights) aspects.[*10] Without any doubt, it is important to acknowledge the economic nature of intellectual property and its interrelation with innovation. At the same time, the legal nature of IP is no less important. The great relevance of the legal aspect of intellectual property is caused by the fact that knowledge by nature is a public good.[*11] This means that knowledge

2 Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Putting knowledge into practice: A broad-based innovation strategy for the EU – COM(2006) 502, 13.09.2006, p. 2.

3 Knowledge-based Estonia. Estonian Research and Development and Innovation Strategy 2007–2013. Available at http://www.hm.ee/index.php?0&popup=download&id=6175 (10.11.2007).

4 *Ibid*., p. 9.

5 Teadus- ja arendustegevuse korralduse seadus. Entered into force on 2.05.1997. – RT I 1997, 30, 471; 2007, 12, 66 (in Estonian). Unofficial translation available at http://www.legaltext.ee (14.05.2008).

6 M. Pohlmann. The Evolution of Innovation: Cultural Backgrounds and the Use of Innovation Models. – Technology Analysis & Strategic Management 2005 (17) 1, p. 9.

7 Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Putting knowledge into practice: A broad-based innovation strategy for the EU – COM(2006) 502, 13.09.2006, p. 2.

8 E. R. Peterson. Seven Revolutions: Global Strategic Trends Out to the Year 2025. – The Multinational Business Review 2004 (12) 2, p. 111.

9 See Article 2 (viii) of the Convention establishing the World Intellectual Property Organisation. Stockholm, 14.07.1967, entered into force in respect to Estonia on 5.02.1994. – RT II 1993, 25, 55.

10 For further discussion see A. Kelli, H. Pisuke. Intellectual Property in an Innovation-based Economy. – Review of Central and East European Law 2008 (33) 2, pp. 223–238.

11 For further discussion see B. Andersen. If 'intellectual property rights' is the answer, what is the question? Revisiting the patent controversies. – Economics of Innovation and New Technology 2004 (13) 5, pp. 417–442.

does not have any attributes that could facilitate the exclusion of others from exploiting it. In the absence of an adequate protection, any investment made in creation of new knowledge is prone to become lost. Since the economic system does not offer sufficient control mechanisms to protect the valuable knowledge generated, it is up to the legal system to fill the gap. The IP system provides legal tools to control the utilisation and commercialisation of the knowledge created. Analysing the essence of IP, one can state that, despite the fact that the utilisation of knowledge takes place in business settings, the control over it is established by the legal system. To sum up, the term 'intellectual property' in this article refers to a combination of the economic (an asset) and legal (rights) concepts. To emphasise the legal aspect of intellectual property, the author uses the term 'intellectual property rights' or the abbreviation 'IPRs'.

The EU innovation strategy is based on the assumption that protection of intellectual property is a *sine qua non* for innovation.*[12] It is obvious that profit-oriented actors are interested in securing their investments.*[13] Intellectual property is certainly a suitable tool to package some results of innovation. Therefore, the European Commission assumes the existence of a correlation between the use of IPRs and good innovation performance.*[14]

In order to analyse correlation between the use of IPRs and innovation performance, one must first highlight some key elements. The mere existence of a large number of IPRs does not necessarily represent outstanding innovation performance. Still, some policy documents prioritise formal indicators such as the number of patents granted. For instance, the strategy document 'Estonian Success 2014' sets forth the following objective: "[T]he number of patents registered per 100,000 inhabitants in Estonia will be multiplied by 10".*[15] The author personally has doubts regarding formalistic goal-setting. A high number of IPRs neither guarantees wealth generation nor certifies innovation performance as excellent. Furthermore, it is also useful to take into account that the number of IPRs could be influenced by other factors and trends. For instance, K. Hussinger hypothesises that "the increase in patents rather is motivated by their heightened strategic value".*[16] In other words, the growing use of IPRs is not necessarily a result of improved innovation performance and a substantial rise in R&D investments; it could reflect a change in business behaviour. The underlying cause of the changed behaviour might be that business actors have started to regard knowledge as a valuable asset that has to be protected. This line of reasoning is supported by Estonian economists, stating that, among other things, "[t]he growing role of knowledge intensity in the economy is also reflected in the explosive growth in the use of different means of intellectual property protection".*[17]

Despite the fact that innovation and intellectual property are intertwined with each other in a rather complex way, the use of IP instruments — patents, in particular — could shed some light on the intensity, extent, and direction of innovation. Since knowledge production is costly, there is a need for protection. Consequently, knowledge is packaged in the form of IPRs (e.g., patents). On account of the design of IP instruments (e.g., disclosure requirements in patenting procedure), outcomes of innovation become visible. Therefore, patent information is a primary source providing valuable insights into emerging technologies as well as trends of innovation. The high costs associated with patents (registration, maintenance, possible infringement suits, etc.) should at least in theory ensure that only the most advanced core technologies are patented. Today's reality is, however, that the majority of patents protect incremental rather than breakthrough inventions. Still, patent databases provide a good overview of innovation. Information concerning the utilisation of IPRs supports the development of models to investigate correlation patterns of IP and innovation.

[12] Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. Putting knowledge into practice: A broad-based innovation strategy for the EU – COM(2006) 502, 13.09.2006, p. 6.

[13] In addition to acquiring intellectual property rights, it is also possible to protect investments in innovation by relying on a short innovation cycle, effects of learning curve, advantages of economies of scale, natural or statutory monopolies, etc. A strategic decision to use only IP-based instruments, combine IP tools with other mechanisms or rely solely on other mechanisms depends on a variety of sector-specific factors.

[14] Communication from the Commission to the European Parliament and the Council. Enhancing the patent system in Europe – COM(2007) 165, 3.04.2007, p. 2.

[15] Eesti Edu 2014. Vabariigi Valitsuse strateegiadokument (Estonian Success 2014. Strategy document of the Government of the Republic). Available at http://www.riigikantselei.ee/failid/EE2014.doc.pdf (19.03.2008), p. 10 (in Estonian).

[16] K. Hussinger. Is Silence Golden? Patents versus Secrecy at the Firm Level. – Economics of Innovation and New Technology 2006 (15) 8, p. 737.

[17] T. Mets, M. Leego, T. Talpsep, U. Varblane. The Role of Intellectual Property Protection in the Business Strategy of University Spin-Off Biotech Companies in a Small Transition Economy. – Review of Central and East European Law 2007 (32), p. 20.

3. Implications of a specific innovation context for the design of IP policy

General objectives and basic principles of innovation are usually similar in all regions and countries. As a rule, innovation is expected to advance physical, social, economic, and environmental welfare. However, the policy measures to achieve the objectives and implement underlying principles of innovation may differ substantially from one national or regional context to the next. Therefore, it has been argued that the transfer of successful regional models for innovation to a different national context fails on account of the lack of their institutional embedding.[*18] The author agrees that framework conditions for innovation are essentially unique in every country and fostering innovation requires tailor-made solutions. In this section of the paper and those that follow, the author addresses some selected issues that need to be considered in the design of innovation and IP policy measures on country and company level.

Toomas Luman, the president of the Estonian Chamber of Commerce and Industry, has pointed out that in order to design appropriate innovation policy it is crucial to consider the profile of Estonian entrepreneurs.[*19] According to the official statistics prepared by Statistics Estonia, the profile of Estonian enterprises by number of employees in 2007 was as follows[*20]:

Enterprises in the statistical profile by year and number of employees

	More than 250	50–249	10–49	Fewer than 10
2007	187	1,379	7,187	67,406

Note: Economically active sole proprietors registered in the Commercial Register, excl. economically active sole proprietors registered only in the Register of Taxable Persons.

From statistical data, we know that the majority of Estonian entrepreneurs' undertakings are small and medium-sized enterprises (SMEs).[*21] This gives rise to the question of whether the profile of Estonian enterprises has an impact on the design of innovation and intellectual property policy. The author is convinced that it does. For reasons of space, the subsequent analysis is confined to consideration of the implications of firm size for IP policy.

The author suggests that the size of an enterprise could influence its capabilities to create, acquire, manage, and utilise proprietary knowledge. The suggestion is based on the assumption that the resources invested in the creation or acquisition of new knowledge (innovative solutions) are independent of firm size. Bigger firms could even reap the benefits of economies of scale and gain advantage from their absorptive capacity. Furthermore, the cost of innovation is not influenced by the subsequent utilisation of the knowledge created. This means that the expenses of developing a product are virtually the same whether for local, regional, or global markets. However, because of the intangible nature of knowledge, entrepreneurs are motivated to exploit it to the maximum extent. When the use of tangible property has limits (e.g., I can use my phone myself or hire it out to someone else, but exercising these two exploitation options simultaneously is not physically possible), then the concurrent exploitation of intangible property is a potential option (I can use my invention myself and license it to someone at the same time). Consequently, enterprises are striving to commercialise their proprietary knowledge in as many markets as possible. To facilitate the process of commercialisation, knowledge is usually packaged in the form of IP (e.g., in the form of patents). Successful commercial exploitation of knowledge is heavily dependent on efficient IP management. It is obvious that large firms are better equipped to manage their IP than small ones are. Of course, there are some exceptions. Still, the superior management capabilities of bigger enterprises result in higher returns, which can be reinvested in knowledge creation or access (e.g., licensing). Small firms, on the other hand, lack the necessary resources for conducting R&D, which is a primary

[18] M. Pohlmann (Note 6), p. 9.

[19] T. Luman. Teadus- ja arendustegevus ning majanduse konkurentsivõime. Probleemid, areng ja suundumused (Research and Development Activities and Competitiveness of Economy. Problems, Developments and Trends). – Tehnoloogia ja teadmussiirde konverents. Ettevõtlike ülikoolide teenused – teaduspõhine koostöö (Conference on Technology and Knowledge Transfer. Services of Enterprising Universities). 24.01.2008.

[20] Information available at http://pub.stat.ee/px-web.2001/Dialog/SaveShow.asp (29.04.2008).

[21] Pursuant the EU policy document "[t]he category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million". See Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (2003/361/EC). – OJ L 124, 20.05.2003, p. 36–41.

input of innovation.*[22] Even if the research activities of a small company lead to a breakthrough invention, it is highly unlikely that the firm can market it regionally and globally on its own. The decisive issue here is the ability of the company to protect and enforce its rights. The protection of rights usually takes place in court, which is rather costly, especially when enforcement is required in different jurisdictions. The same concern has been raised in the theoretical literature as well: "High litigation costs are particularly destructive of the contributions to innovation that smaller firms have proved they can make. It is obvious that the measurable costs of prosecuting or defending an action for patent infringement are far beyond the resources of all but the largest firms, apart from the fact that the burden of the costs that cannot be measured (such as distraction from more immediately paying tasks) falls most heavily on smaller ones."*[23]

The aim of the above discussion is not to say that SMEs cannot be innovative, or that innovation and IP policy should disregard them. The author feels quite the opposite. The main concern is whether an innovation and IP policy designed mainly for big companies and IP tools used by large corporations meet the needs of small enterprises. Understandably, concrete IP policy cannot be based only on formal characteristics such as the size of the firm involved. There are also suggestions in the literature that "[f]irm size affects the probability to introduce an innovation, but it is less important in affecting the innovation strategy followed by firms. Most of the differences between the innovation behaviours and performances of large and small firms are, therefore, due to compositional effects, that is, to the fact that large corporations tend to concentrate in highly innovative industries (and countries), whereas small firms concentrate in more traditional sectors."*[24] Therefore, it would also be necessary to monitor the dynamics of patent applications and patents granted to Estonian enterprises. Analysis of patenting trends could provide a basis for identification of emerging innovative sectors and development of measures to support these sectors.

In addition to state-level policy measures, there are certain steps that Estonian entrepreneurs can take themselves for improved competitiveness. The key issue here is the adoption of an appropriate innovation model. It is possible to distinguish between different approaches to innovation on company level. One possible way to manage innovation is that of a single company trying to control its entire process of creation of value from knowledge. H. W. Chesbrough refers to this model as the Closed Innovation. According to Chesbrough, the Closed Innovation is an internally focused approach, one that requires companies to generate their own ideas and then develop and commercialise them on their own. The Closed Innovation approach expects entrepreneurs to be self-reliant.*[25] It is obvious that, in order to be a successful actor in the framework of the Closed Innovation, an entrepreneur needs a considerable amount of resources. Since small companies lack financial strength, they cannot effectively be involved in innovation. However, there is another way to manage innovation. It is called Open Innovation. Chesbrough describes it as follows: "Open Innovation means that valuable ideas can come from inside or outside the company and can go to market from inside or outside the company as well. This approach places external ideas and external paths to market on the same level of importance as that reserved for internal ideas and paths to market during the Closed Innovation era."*[26] As described above, the logic of Open Innovation does not require an entrepreneur to capture value in the construction of an entire value chain on its own. A high proportion of the value can be claimed for fulfilment of some key functions (e.g., generation of new knowledge, adding useful features to existing products, etc.) within a value chain. The approach of Open Innovation is especially relevant for small companies, since it allows them to operate with only modest resources. Considering the profile of Estonian enterprises, one can see several advantages of Open Innovation for them.

In the following sections of the paper, the author discusses possible implications of the profile of Estonian enterprises for IP policy. First the author concentrates on state-level IP policy, before exploring possible company-level actions to foster innovation.

[22] It is necessary to emphasise that R&D expenditure is not the only characteristic of innovative firms. R. Evangelista and V. Mastrostefano conclude correctly that "the innovation strategy of firms cannot be defined only through their commitment to R&D. Other activities such as the design and the acquisition of know-how and training do differentiate the innovative behaviours of firms and the technological profile of industries." See R. Evangelista, V. Mastrostefano. Firm Size, Sectors and Countries as Sources of Variety in Innovation. – Economics of Innovation and New Technology 2006 (15) 3, p. 266.

[23] W. Kingston. Innovation needs patents reform. – Research Policy 2001 (30), p. 410.

[24] R. Evangelista, V. Mastrostefano (Note 22), p. 267.

[25] H. W. Chesbrough. Open Innovation: The New Imperative for Creating and Profiting from Technology. Harvard Business School Press 2003, p. XX.

[26] *Ibid*., p. 43.

4. Proposed areas of focus for Estonian IP policy

4.1. State-level IP policy

Estonia has adopted the major IP-related international legal instruments. For instance, Estonia is a signatory to the Paris Convention for the Protection of Industrial Property*[27], the Berne Convention for the Protection of Literary and Artistic Works*[28], and the Agreement on Trade-Related Aspects of Intellectual Property Rights*[29] (the TRIPS agreement). Estonia is also a party to key regional agreements in the field of IP (such as the European Patent Convention*[30]) and has harmonised its legislation with the corresponding EU directives in the field of IP. Therefore, it could be said that the general legal framework for IPRs in Estonia does not differ substantially from that in highly developed and innovative European countries (e.g., Sweden, Finland, Germany, and Denmark). Still there is a remarkable difference in R&D investments as a primary input to innovation when one compares Estonia to the countries mentioned. In 2006, gross domestic expenditure on R&D as a percentage of the gross domestic product was 3.73% in Sweden, 3.45% in Finland, 2.53% in Germany, 2.43% in Denmark, and 1.14% in Estonia.*[31]

A co-ordinated effort spanning many years definitely is going to be required of public and private stakeholders alike before Estonia can reach a comparable R&D investment level. For instance, it is crucial to support university and business research in technical fields and the life sciences. If new knowledge is created by university researchers, it is vital to assure that other stakeholders in a knowledge-based economy can utilise it. For reasons of space, it is not possible to consider all necessary actions on these pages. In this section, the author discusses only some state-level IP policy measures. The author's main argument here is that, even though Estonian intellectual property regulations are mostly based on international and EU principles, it is still possible to adjust them to the Estonian economic context, which could in the end foster innovation. The author would also like to emphasise that even an excellent legal framework for IPRs is useless unless entrepreneurs and other stakeholders are aware of it.

The author is convinced that a key issue of innovation policy is the creation of IP awareness. Special measures have to be designed for different target groups (university students, entrepreneurs, etc.). In order to raise the level of IP awareness of those who will contribute to the construction of a knowledge-based economy, it is crucial that a general course on IP be made compulsory for all university students. In some fields (among them law, economics, engineering, and the biological sciences), students should be offered advanced courses on IP. When it comes to entrepreneurs, special attention in promoting IP awareness (e.g., through training and consultancy) should be paid to economic exploitation of intellectual property. In addition to understanding the basics of IP, entrepreneurs have to acknowledge their need for IP competencies. In the context of this paper, IP competencies are defined as skills that are crucial for creating, protecting, and commercialising intellectual property, as well as for managing it in the intellectual value chain.*[32] Put differently, entrepreneurs require capabilities to construct IP-based business models, develop their IP strategy, evaluate IP, etc.

Besides traditional methods of increasing IP awareness (training and courses, consultancy services, etc.), case law could also be considered as an efficient mechanism to enhance IP awareness, particularly among lawyers and entrepreneurs. Case law evolves alongside the economy and provides market participants with valuable guidelines and feedback for evaluating their business strategies, including IP strategies.

Estonian IP-related case law is not very extensive, and only a few cases have addressed protected inventions. There are still some landmark decisions, however. For instance, the case *AS Balteco v. AS Neoqi* decided by the Estonian Supreme Court is quite explicit as to what happens to entrepreneurs who do not manage their productive knowledge properly. In this case, some ex-employees of AS Balteco established the company AS Neoqi, which started to manufacture products similar to those of AS Balteco. Additionally, AS Neoqi protected its product as a utility model. Even though AS Balteco claimed that its trade secrets were misused and the utility model was invalid (allegedly, it lacked novelty and an inventive step), the Estonian Supreme Court did not support these claims.*[33] The case shows that it is not enough if we treat IP as an asset; we should also

[27] Paris Convention for the Protection of Industrial Property. Paris, 20.03.1883, entered into force in respect to Estonia on 24.08.1994. – RT II 1994, 4–5, 19.

[28] Berne Convention for the Protection of Literary and Artistic Works. Berne, 9.09.1886, entered into force in respect to Estonia on 26.10.1994. – RT II 1994, 16–17, 49.

[29] Agreement on Trade-Related Aspects of Intellectual Property Rights. Marrakech, 15.04.1994, entered into force in respect to Estonia on 13.12.1999. – RT II 1999, 22, 123.

[30] Convention on the Grant of European Patents. München, 5.10.1973, entered into force in respect to Estonia on 1.07.2002. – RT II 2002, 10, 40.

[31] Eurostat. Gross domestic expenditure on R&D as a percentage of GDP. Available at http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=REF_SI_IR&root=REF_SI_IR/si_ir/tsiir020 (18.07.2008).

[32] IP Knowledge Centre within the ScanBalt BioRegion (2003), project No. 02150, p. 15.

[33] CCSCd 16 November 2005, in matter 3-2-1-115-05. – RT III 2005, 40, 400 (in Estonian).

establish control over it by packaging knowledge as a patent or utility model or another IPR form. It is also crucial to take the steps necessary to protect one's trade secrets.

The next required measure taken simultaneously with creation of awareness is to design and fine-tune IP tools that correspond to the actual needs of Estonian entrepreneurs. As shown above, the majority of Estonian entrepreneurs are very small enterprises. The following analysis concentrates mainly on utility models, patents, and trade secrets and their role for small businesses.

The author suggests that utility models could be useful IP tools for SMEs for a variety of reasons. Subsection 5 (1) of the Utility Models Act[*34] defines utility models as "inventions that are new, that involve an inventive step, and that are susceptible to industrial application". Utility models have lower inventive step thresholds than do patents, which makes them particularly suitable for small companies. An important role of utility models has also been acknowledged in the theoretical literature. For instance, W. Cornish & D. Llewelyn emphasise that "industry needs a system of short-term rights protecting minor technical advances, which supplements the patent system and is particularly valuable where know-how cannot be kept secret".[*35] The author of the present work presumes that the role of utility models is not limited to protecting incremental inventions. Positive features of utility models (e.g., the lesser inventive step requirement, the affordable registration fees, and efficient protection) could lead to wide acceptance of this IP tool by entrepreneurs. All of this would create a good environment to enhance IP culture among Estonian enterprises. After development of capabilities to manage utility models, it would be easier to realise the potential of the patent system. Therefore, the author suggests analysis of the existing regulation on utility models and its practical implementation to identify and tackle potential problems. It would also be advisable to further develop mechanisms encouraging and supporting the use of utility models. In addition, the author would welcome the substantial harmonisation of the regulation on utility models at the EU level. Since business activities of even small firms are not always confined to the territory of a state, the absence of a similar legal framework might become an obstacle to value creation via innovation.

As a general rule, patents are not considered suitable IP tools for SMEs. For instance, W. Kingston argues that the patent system "serves small firms, which have most need of effective protection for their inventions, particularly badly".[*36] K. Hussinger seems to support this position by arguing that "patents are used where the expected monopoly profits are large".[*37] There are also surveys that show that small enterprises prefer specific IP tools. For instance, "small firms, on average, do not rely more on patents than on secrecy in comparison with large firms. Instead, small firms are less likely than large firms to find patents to be of greater value than secrecy for product innovations, although there is little difference by firm size for process innovations".[*38] The discussion above indicates that it would be appropriate to review critically the existing legal mechanisms for protection of trade secrets[*39], especially in economies largely composed of SMEs. The author's intention is not to suggest that the Estonian economy does not need a patent system. In fact, the author is convinced that a patent system is an essential condition for innovation. The main argument here is that an efficient mechanism for legal protection of trade secrets and a functioning patent system could complement each other. In addition, strong protection for trade secrets would benefit not only SMEs but also large corporations. Even for big companies, it is not always useful to patent inventions (e.g., if market exploitation of the inventions is very far off or the inventions relate to a process). In the cases described, secrecy could be a good option.

Legal protection of trade secrets is regulated by a number of legal acts in Estonia. Since Estonia is a party to several IP-related international agreements, it is necessary to consider the regulation material of these as well. For instance, Article 39 of the TRIPS agreement establishes a general framework for protection of undisclosed information.[*40] Sections 50 and 52 of the Competition Act[*41] address misuse of confidential information prohibited as unfair competition. Section 50 of the Republic of Estonia Employment Contracts Act[*42] obliges an

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[34] Kasuliku mudeli seadus. Entered into force on 23.05.1994. – RT I 1994, 25, 407; 2007, 13, 69 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

[35] W. Cornish, D. Llewelyn. Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights. 6th edition. London: Sweet & Maxwell 2007, p. 10.

[36] W. Kingston (Note 23), p. 411.

[37] K. Hussinger (Note 16), p. 751.

[38] A. Arundel. The relative effectiveness of patents and secrecy for appropriation. – Research Policy 2001 (30), p. 622.

[39] In this article the terms 'trade secret', 'know-how', 'undisclosed information' and 'confidential information' are regarded as synonyms.

[40] Pursuant to the referred article of the TRIPS agreement "persons shall have the possibility of preventing information lawfully within their control from being disclosed to, acquired by, or used by others without their consent in a manner contrary to honest commercial practices so long as such information: (a) is secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question; (b) has commercial value because it is secret; and (c) has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret".

[41] Konkurentsiseadus. Entered into force on 1.10.2001. – RT I 2001, 56, 332; 2007, 66, 408 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

[42] Eesti Vabariigi töölepingu seadus. Entered into force on 1.07.1992. – RT 1992, 15/16, 241; 2007, 44, 316 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

employee to maintain the business and production secrets of the employer. Sections 186, 313, and 325 of the Commercial Code[*43] provide that the members of the management and supervisory board shall preserve the business secrets of the company. Sections 372 and 625 of the Law of Obligations Act[*44] require a licensee and a mandatary to maintain the confidentiality of information of which they become aware in connection with the fulfilment of the agreement.

The author is of the opinion that, on account of a presumption of high strategic relevance of trade secret protection to Estonian entrepreneurs, regulations on trade secrecy could be more detailed. Even adoption of a special legal act (e.g., a 'Trade Secrets Act') should be considered. The scope of information protected as trade secrets need not be necessarily extended. Rather, the main issue is to specify protection criteria, the legal status of trade secrets developed by an employee, procedural issues (e.g., the burden of proof), etc. The design of effective legal measures to protect confidential information requires a comprehensive understanding of the economic context of trade secret misappropriation. Legal acts and contracts forbid an employee or other person (e.g., a party to some contract, a management board member, or the like) who becomes aware of a trade secret during employment or fulfilment of his or her contractual obligations from revealing or using it. A company's unlawful exploitation of someone else's trade secret is generally regarded as unfair competition, which is prohibited by law. To sum up, the measures to protect trade secrets are applied on two levels: on the first level, an employee or other person is obliged to maintain somebody else's trade secret, and on the second level entrepreneurs (usually competitors) are forbidden to obtain a rival's trade secret by means of dishonest commercial practices. In a dispute, the measures described may turn out to be ineffective. Elise Vasamäe has raised a relevant issue related to the existence of effective legal protection measures in the case where it is obvious that a competitor is using a rival company's trade secret but the latter is not able to prove that the trade secret was acquired by dishonest means (e.g., from an employee of the rival company).[*45] Without any doubt, all entrepreneurs should create strategies to protect their IP (including trade secrets). These strategies should include routines to map existing trade secrets, even establishing platforms for digital management of documents containing trade secrets. However, the reality is that SMEs might not have the resources to do so. One possible solution might be that if a company discovers that a competitor is exploiting its trade secret and other circumstances suggest that it was obtained unlawfully (e.g., from an employee of the company) the competitor would be required to prove the origin of the trade secret. A similar approach is used to protect process patents.[*46] Still the proposal requires further analysis since reversal of the burden of proof as described could create many new problems (for example, in order to find out more about a competitor's trade secret, it would be enough simply to accuse the competitor of stealing your trade secret).

4.2. A need to enhance the IP competencies of Estonian entrepreneurs

Statistical information shows us that Estonian gross domestic expenditure on R&D as a percentage of the gross domestic product was 0.93% in 2005 and 1.14% in 2006.[*47] The percentage of the total R&D expenditure borne by Estonian industry was 38.5% in 2005 and 38.1% in 2006. In other European countries, the percentage of gross domestic expenditure on R&D financed by industry was 65.7% in Sweden, 66.9% in Finland, 67.6% in Germany, 59.5% in Denmark, 79.7% in Luxembourg, 20.8% in Lithuania, and 34.3% in Latvia in 2005.[*48]

The data can reveal several relevant facts. Firstly, there has been growth in Estonian R&D expenditure. Secondly, Estonian entrepreneurs have not increased their investments in R&D. Finally, industry in developed countries accounts for a greater share of R&D investments. The author suggests that, because of the changes taking place in the Estonian economy[*49], Estonian entrepreneurs increasing their R&D spending is inevitable.

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43 Äriseadustik. Entered into force on 1.09.1995. – RT I 1995, 26–28, 355; 2007, 67, 413 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

44 Võlaõigusseadus. Entered into force on 1.07.2002. – RT I 2001, 81, 487; 2007, 56, 375 (in Estonian). Unofficial translation available at http://www.legaltext.ee (30.04.2008).

45 A communication with Elise Vasamäe during the author's presentation in IP seminar held by Professor Norbert Reich (26.04.2008).

46 Article 34 of the TRIPS agreement sets out the following principle: "if the subject matter of a patent is a process for obtaining a product, the judicial authorities shall have the authority to order the defendant to prove that the process to obtain an identical product is different from the patented process".

47 Eurostat. Gross domestic expenditure on R&D as a percentage of GDP. Available at http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=STRIND_INNORE&root=STRIND_INNORE/innore/ir021 (12.04.2008).

48 Eurostat. Gross domestic expenditure on R&D by source of funds — industry. Available at http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,39140985&_dad=portal&_schema=PORTAL&screen=detailref&language=en&product=STRIND_INNORE&root=STRIND_INNORE/innore/ir022 (12.04.2008).

49 See U. Varblane *et al.* Eesti majanduse konkurentsivõime hetkeseis ja tulevikuväljavaated. Aruanne tellitud Eesti Arengufondi poolt (Current Competitive Status and Prospects of the Estonian Economy. Report ordered by the Estonian Develoment Fund). Available at http://www.arengufond.ee/files/ty_raport.pdf (12.04.2008) (in Estonian).

The Green Paper on the European Research Area also emphasises that "[t]he business sector is supposed to contribute two-thirds of the 3% of GDP R&D intensity target".*[50] Besides investing more in knowledge production, Estonian entrepreneurs need to enhance their IP competencies in order to manage the outcomes of innovation effectively. In this section of the article, the author analyses some IP-related issues that entrepreneurs have to consider in their everyday business.

One of the objectives of doing business is to make a profit. Economic reality is that services and products used for creation of wealth are becoming increasingly knowledge-intensive. Therefore, it has been suggested that the three traditional factors of production (land, labour, and capital) are overshadowed by knowledge.*[51] B. Andersen has explained this further: "The battles are not for control of raw materials, but for the control of the most dynamic strategic asset, namely 'productive knowledge'."*[52] Thus it can be argued that it is vitally important for an entrepreneur to enhance and protect its productive knowledge base. One of the first steps an entrepreneurial enterprise could take is to develop its internal IP regulation. The author outlines only some practical matters (ownership of IP created within the employment context, a policy of rewarding employees' creativity, and strategies to manage IP).

On account of the nature of legal entities, it is evident that a legal person cannot create any knowledge on its own. Therefore, a legal person has to establish a mechanism for control over the knowledge generated by its employees. This is especially important for Estonian entrepreneurs since the existing legal framework is inconsistent and insufficient.*[53] For instance, § 12 (2) of the Patents Act*[54] provides that "[i]f an invention is created in the performance of contractual obligations or duties of employment, the right to apply for a patent and to become the proprietor of the patent is vested in the author or other person pursuant to the contract or employment contract".*[55] However, pursuant to § 14 (2) of the Industrial Design Protection Act*[56], "[t]he right to apply for the registration and ownership of an industrial design created in the performance of duties of employment or contractual obligations is vested in the employer or the customer, unless the duties of employment or the contract prescribe otherwise". In practical terms, this means that if a person during an employment period or in the course of fulfilment of contractual obligations creates an invention and a design and IP issues are not *expressis verbis* agreed upon, then the right to apply for the registration of the design would belong to the employer or the customer and the right to apply for a patent would be vested in the inventor. The author of this article is unaware of conceptual considerations that explain why the ownership presumption is regulated differently in the cases of patents and designs.

Difficulties could arise also in relation to copyrights. Subsection 32 (1) of the Copyright Act*[57] sets out a general rule, under which "[t]he author of a work created under an employment contract or in the public service in the execution of his or her direct duties shall enjoy copyright in the work but the economic rights of the author to use the work for the purpose and to the extent prescribed by the duties shall be transferred to the employer unless otherwise prescribed by contract". Still, it is sometimes important for an employer to have a licence covering the author's moral rights as well. For example, when an employee creates a logo, the economic rights shall be transferred automatically to the employer. However, the author's consent is needed for change to the logo since, pursuant to § 12 (1) of the Copyright Act, the right of the integrity of the work and of supplementation of the work are moral rights that are not automatically transferred to the employer. In addition to problems related to moral rights, it is necessary that employment contracts are specific enough to define the direct duties of an employee. The reason is that the economic rights of an author are transferred to an employer only in respect of works created in the execution of the empoyee's direct duties.

In summary, all of the potential problems described here that relate to the ownership of IP and could face entrepreneurs can be alleviated through the adoption of internal IP regulation. However, the author is somewhat confused when confronted with the present situation. At the moment, we have more than 70,000 enterprises in Estonia, all of which must consider the issue of IP ownership. The business reality is that a company in

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[50] Green Paper. The European Research Area: New Perspectives – COM(2007) 161, 4.04.2007, p. 7.

[51] E. R. Peterson (Note 8), p. 116.

[52] B. Andersen (Note 11), p. 417.

[53] A very good analysis in respect of legal status of inventions created within employment or contractual relationships in Estonia is provided by J. Ostrat. See J. Ostrat. Töösuhtes või muu lepingu täitmisel tehtud leiutise õigusliku reguleerimise probleeme. Kas lepinguvabadus või eraldi seadus? (Problems in the Legal Regulation of an Employment-Relationship Invention. Freedom of Contract or a Separate Law?). – Juridica 2007/3, pp. 189–198 (in Estonian).

[54] Patendiseadus. Entered into force on 23.05.1994. – RT I 1994, 25, 406; 2007, 13, 69 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

[55] Subsection 11 (2) of the Utility Models Act provides similarly: "[i]f an invention is created in the performance of contractual obligations or duties of employment, the right to apply for the registration of a utility model and to become the owner of the utility model is vested in the author or another person pursuant to the contract or employment contract".

[56] Tööstusdisaini kaitse seadus. Entered into force on 11.01.1998. – RT I 1997, 87, 1466; 2007, 13, 69 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

[57] Autoriõiguse seadus. Entered into force on 12.12.1992. – RT 1992, 49, 615; 2007, 13, 69 (in Estonian). Unofficial translation available at http://www.legaltext.ee (13.04.2008).

need of, say, a logo contacts some enterprise or individual and commissions creation of the logo. After the work has been done and approved by the customer, the latter pays the sum of money agreed upon. In another scenario, an employee generates new knowledge that could be packaged in the form of IP (e.g., a patent or design) in the course of employment and gets rewarded. The cases described could be regarded as involving normal business practice. Still, serious problems arise if IP issues are not agreed upon in detail. The Estonian legal environment requires entrepreneurs and other individuals to conclude special IP contracts, adopt internal regulations, etc. The author believes that it is not always necessary to change business practices and raise awareness among more than 70,000 Estonian enterprises; it would be more appropriate to make the Estonian legal environment more business- and innovation-friendly by providing, for instance, that in certain cases IP rights are assigned and conclusion of licence agreements is presumed automatically.

In order to leverage human capital, it is essential to establish an appropriate employee incentive system. The aim of incentives is to reward employees who contribute to generation of wealth. The development of the incentive system within a knowledge-based economy is a complicated challenge from both the legal and the economic standpoint — one that entrepreneurs have to face. Legal acts provide a general framework that needs to be taken into account in the design of economic incentives. Subsection 13 (8) of the Patents Act entitles an inventor to the following proprietary right: "An author has the right to receive fair proceeds from the profit received from the invention."[*58] A key issue for both employer and employee is how to interpret the concept of fair proceeds. The mere creation of IP (e.g., a patentable invention) should not necessarily be rewarded. It has been asserted that "technology by itself has no inherent value; that value only arises when it is commercialised through a business model".[*59] It is also necessary to bear in mind that a marketable product could be protected by many intellectual property rights (patents, design rights, trademarks, copyrights, etc.). Consequently, it is a quite complicated business to assess the value of a single protected invention. In addition, an entrepreneur might invest in many projects and find that only a few of them generate any returns. To sum up, the determination of what constitutes fair proceeds can only be based on economic analysis. Therefore, the legal framework has to be flexible and provide an employer and employee with considerable amount of freedom in determining their relations.

The success of a company depends a great deal on its business strategy. Best practice would be to incorporate an IP strategy into the general business strategy of each enterprise. An IP strategy should include guidelines on choosing an appropriate form of protection. For instance, after the creation of a patentable innovative solution, an entrepreneur faces three options: 1) to patent the invention or apply for a utility model, 2) to make the invention public, and 3) to keep the invention secret.

For numerous reasons, applying for a patent or a utility model is not always the best option. In order for one to patent an invention or apply for a utility model, the invention must be disclosed. This means that everyone can become aware of it. Since patent and utility model protection is territorially bounded and has time limits, it is possible to exploit the invention after the patent or utility model has expired or in jurisdictions where protection was not sought. Patenting is a costly procedure, and granting of a patent does not guarantee income. Even if the patent once issued is not invalidated for failure to comply with patentability criteria (concerning novelty, the inventive step, and industrial application) in a legal dispute, this does not mean that the patent is going to generate returns. A large proportion of patents do not yield any income. As a consequence of the lower costs, applying for utility model registration could be a good alternative to patenting. It is also necessary to consider that a single product could incorporate many patented inventions and other IPRs (e.g., designs, copyrights, and trade secrets). In these circumstances, it would be advisable to protect the core components or technology of the product rather than all possible features.[*60] A decision to seek a patent or apply for a utility model should depend on the business model of the relevant enterprise.

Decision not to apply for a patent or utility model leads to another dilemma: to make the essence of the invention public or keep it secret. Both options have their advantages and disadvantages. The defensive publishing of the invention prevents someone else patenting it[*61] and as a result excluding others from using the invention. A company can disclose the invention itself or use someone else's services.[*62] However, after publication, the invention enters the public domain and no-one has control over it.

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[58] Subsection 12 (8) of the Utility Models Act provides the same principle: "[a]n author has the right to receive fair proceeds from the profit received from the utility model".

[59] H. W. Chesbrough (Note 25), p. 156.

[60] Trade secrets could be considered very useful tools to supplement patent and utility model protection. For instance, production of a product usually requires extra knowledge than the information which can be obtained from patent databases. In case this information is kept secret, the patent expiration does not necessarily mean that everyone can manufacture the product. They still need additional know-how.

[61] In order to patent an invention, it must be new, involve an inventive step and be industrially applicable. Due to the publication, an invention loses its novelty.

[62] For instance, IP.com offers a wide range of services including Prior Art Database as an outlet for publishing and searching technical disclosures. Further information available at http://www.ip.com/ (18.04.2008).

A firm might prefer to keep the invention secret. As stated above, SMEs often protect their knowledge as trade secrets. On the one hand, this form of protection does not require following a formal registration procedure, filing of any applications, payment of a registration fees, etc., but, on the other hand, there are many complicated problems related to the protection of trade secrets. In order to have an effective protection strategy, entrepreneurs must clearly define*[63] and list their trade secrets. The list should not be closed. It is recommendable to regulate who owns trade secrets developed by an employee. There is one additional practical matter that needs to be considered. Even if a company treats an invention as a trade secret, it is possible for another firm to create the same invention independently and patent it. In this scenario, the concept of prior user's right guarantees that the former company may continue to use the invention. Prior user's right is a statutory non-exclusive licence.*[64] Subsection 17 (1) of the Patents Act describes the prior user's right as follows: "A person who, prior to the filing of a patent application for an invention by another person, has, in good faith and independently of the applicant, used the same invention for industrial application in the Republic of Estonia, may continue to use the invention retaining the same general nature of application".*[65] Still, in order to rely on the concept of prior user's right, one must prove that one has that right. Therefore, a company's internal IP regulation should include well-specified procedures (e.g., files containing trade secrets could be signed digitally) to ensure the right of prior use for the firm even if the firm's trade secret becomes patented by someone else.

5. Conclusions

Because of the transformation into a knowledge-based economy, intellectual property has become an integrated component of the innovation process. Consequently, the IP system has to be constructed with the aim of enhancing innovation. In order for one to understand the contemporary concept of intellectual property fully, it is not sufficient to conceptualise IP either as an economic asset or as legal rights. The two aspects have to be integrated. In analysis of the essence of IP, it can be said that, despite the fact that the utilisation of knowledge takes place in business settings, the control over it is established within the legal system.

The framework conditions for innovation are essentially unique in every country, and fostering innovation requires tailor-made solutions. For instance, an important issue to be considered is the profile of the entrepreneurs. The majority of Estonian enterprises are small SMEs, which influences their capabilities to create, manage, and exploit IP. In order to be successful, small companies should adopt an Open Innovation model, which allows extraction of value from their knowledge without creation of an entire value chain on their own.

The author suggests that utility models could be very useful IP tools for SMEs, for a variety of reasons. The role of utility models is not limited to protecting incremental inventions. Positive features of utility models (e.g., lower inventive step requirement burden, affordable registration fees, and efficient protection) could lead to wide acceptance of this IP tool by entrepreneurs. All of this would create a good environment to enhance IP culture among Estonian enterprises. After development of capabilities to manage utility models, it would be easier to realise the potential of the patent system. Therefore, the author proposes analysis of the existing regulation concerning utility models and the practical implementation thereof, for identification and tackling of potential problems. It would be advisable to develop mechanisms encouraging and supporting the use of utility models. The author would also welcome substantial harmonisation of regulations concerning utility models at the EU level, to provide SMEs with a suitable IP tool to protect the results of innovation in many EU countries.

The theoretical literature and empirical surveys confirm that small firms usually prefer trade secrets to protect their knowledge base. Therefore, the author suggests critical review of the existing legal mechanisms for protection of trade secrets in economies such as that of Estonia, which consist largely of SMEs. The author is of the opinion that, because of presumption of high strategic relevance of trade secret protection to Estonian entrepreneurs, regulations on trade secrecy could be more detailed in Estonian legal acts. Even adoption of a special legal act (in such a form as an act on trade secrets) should be considered. The scope of information protected as trade secrets need not be necessarily extended. The main issue is, rather, to specify protection criteria, the legal status of trade secrets developed by an employee, procedural issues (e.g., the burden of proof), etc.

The success of an innovation does not depend solely on actions taken at the national or regional level. There is much that entrepreneurs could do. For instance, they could adopt internal IP regulations to address relevant issues such as ownership of IP created within the employment context, a policy to reward employees' creativity, and strategies for managing IP.

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[63] In case trade secrets are not defined it is very complicated to prove that someone has misused them. See CCSCd, 16 November 2005, in matter 3-2-1-115-05. – RT III 2005, 40, 400 (in Estonian).

[64] It is still necessary to bear in mind that the concept of prior user's right might differ in different jurisdictions.

[65] Subsection 16 (1) of the Utility Models Act provides the same principle: "A person who, prior to the filing of a registration application for an invention by another person, has, in good faith and independently of the person who files the registration application, used the same invention for industrial application in the Republic of Estonia, may continue to use the invention retaining the same general nature of application".