Patent Valuation for Fair Royalty Distribution in Patent Pool*

Young-Ki Kim† · Seong-Taek Park†† · Seung-Jun Lee†††

Abstract

In this paper, we discuss patent pool and a patent valuation scheme for fair royalty distribution among the patents in a pool. In the knowledge-based economy, intellectual capital—the accumulation of technology and know-how—is recognized as the most important source of company's competitive advantage and economic growth. By providing exclusive rights to patent holders, the patent system aims to encourage innovation—invention & commercialization ofnew technologies—in order to raise the standard of living. However, drawbacks of patent system, which occur as the number of patents issued increases rapidly and patent ownership is fragmented, may slow down the innovation efforts seriously. A promising solution is the patent pool approach, which was for instance employed by the U.S. congress during World War I to free the airplane manufacturers from the patent tangle by letting them license all the patents for a fee. It is necessary to figureout relative technological contribution of patent for fair distribution of royalty revenues among patent holders. The Rating/Ranking Method seems to fit to that valuation °urpose. We examined technology valuation models from various organizations and selected a set of more influential vwhich was actors which can be incorporated as scoring criteria in the Rating/Ranking Method.

Keywords : knowledge-based economy, innovation, patent pool, patent valuation

1. Introduction

Innovation is the engine of economic growth. Andrew Carnegie was an exemplary innovator who acquired the knowledge to produce high quality steel and established the most competitive steel company in the world to supply durable steel for U.S. rails [8]. His innovation earned him a huge personal wealth, gave his company a

† Professor, Department of MIS, College of Business, Chungbuk National University
†† Ph.D. Department of MIS, College of Business, Chungbuk National University (Corresponding Author)
††† Ph.D. Candidate, Graduate School of MIS, Chungbuk National University
Received : 2009-12-10, Amended: 2010-02-01, Accepted : 2010-03-01
* This work was supported by the research grant of the Chungbuk National University in 2009.

remarkable competitive advantage, and drove the national economic growth for his country. It should be noted that Mr. Carnegie was able to enjoy the monopolistic position in the market in part because his steel manufacturing knowledge was protected by the patent system. A successful innovator would accomplish two things: knowledge acquisition and commercialization. Put differently, innovation consists of two parts: invention and commercialization. Nowadays, knowledge is recognized as the most important factor of production so that the term 'knowledge based economy' becomes very popular. In a business context, knowledge usually means technology and know how.

According to the glossary of OECD [16], the knowledge based economy is an expression coined to describe trends in advanced economies towards greater dependence on knowledge, information and high skill levels, and the increasing need for ready access to all of these by the business and public sectors. The term was popularized in the last decade when the importance of intellectual capital—the accumulation of scientific knowledge and business know how—as a tool for economic benefits was widely recognized [3]. However, as we can see in Mr. Carnegie's example, the economic value of knowledge was neither made light of nor ignored even in the 19th century. In a sense, innovative knowledge has always been a crucial factor in improving human beings' welfare for thousands of years.

The patent system is to encourage the development of innovative knowledge by providing incentives to invent, invest in, and disclose new technology. For example, the United States Patent and Trademark Office (USPTO) [17] defines its role to promote the progress of science and the useful arts by securing for limited times to inventors the exclusive right to their respective discoveries, noting that the strength and vitality of the U.S. economy depends directly on effective mechanisms that protect new ideas and investments in innovation and creativity.

As mentioned above, innovation consists of two parts: invention and commercialization. It is true that the patent system encourages the invention activities—the first part of innovation—as clearly shown in the rapid increase of the number of patents issued. In some situations, however, strong patent protection seems to have some negative impact on commercialization—the second part of innovation—mainly because most of time a new product or service needs licenses of multiple patents which often are held by many patentees. For example, the U.S. airplane industry stranded in the patent tangle because various companies were threatening all other airplane and seaplane manufacturing companies with suits for infringements of patents [6]. Even though there were already all the necessary technologies available for airplane manufacturing, the commercialization of those technologies was retarded because the patent holders could not agree on licensing terms. In order to remedy the difficulties, the U.S. Congress created a patent pool, putting all airplane patents under the control of the Manufacturer's Aircraft Association (MAA) and letting manufacturers license them for a fixed fee.

Ideally, once a new technology is invented, it is desirable that the technology is disclosed for free to anyone who wants to use it. For example, Timothy J. Berners

Lee developed the computer program that exploded into the World Wide Web, launching a still unfinished revolution and touching countless lives [2]. Surprisingly, he chose not to patent his Web program because he worried that if the Web were based on proprietary software, it would trigger the development of many other webs by the likes of Microsoft, IBM, and Apple Computer. If they weren't compatible, his vision of connecting everyone everywhere would go nowhere. Even though his decision not to patent his invention deprived him of the chance to be the richest person in the world, it surely made today's Web happen. However, it should be noted that unless we provide some patent right protection, people might have too little incentive to invent. In other words, there should be some appropriability mechanisms for innovation.

The trends of strong patent rights, along with cumulative nature of innovation, the complements problem, fragmented patent ownership, and rise of patent trolls, tend to create patent thickets which can slow down innovation. In some situations, the transaction costs of learning about and individually licensing all existing relevant patents are high enough to undermine significantly the economic incentive to develop follow on innovation. For example, in industries such as semiconductors in which the ratio of patents to products is high, a firm cannot make a new product without infringing hundreds, if not thousands, of patents [5].

Patent Pool is a promising solution for patent thicket, as demonstrated in the case of the U.S. airplane industry early 1900s. The basic idea of patent pool is to assemble fragmented patent ownership to lower the transaction costs for licensing negotiations.

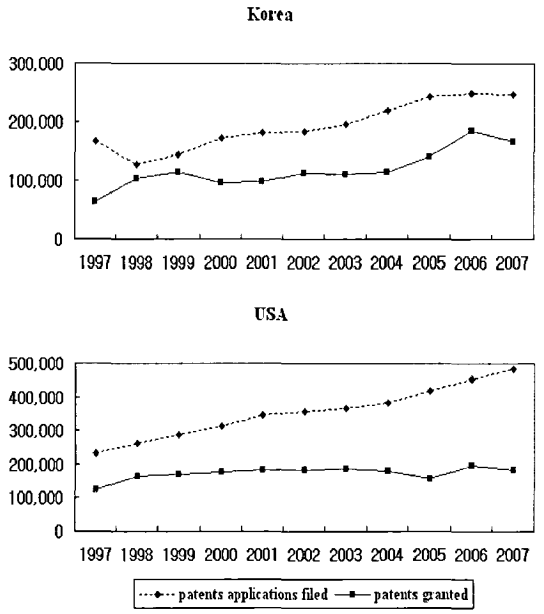
It is necessary to figure out relative technological contribution of patent for fair distribution of license revenues among patent holders. We suggest that the Rating/Ranking Method is an appropriate approach for that valuation purpose, and select a set of scoring criteria from various valuation factors employed by leading patent valuation organizations.

2. Problems With Patent System

One of the drawbacks of current patent system is patent thicket. A patent thicket is a dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology. With cumulative innovation and multiple blocking patents, stronger patent rights can have the perverse effect of stifling, not encouraging innovation [11].

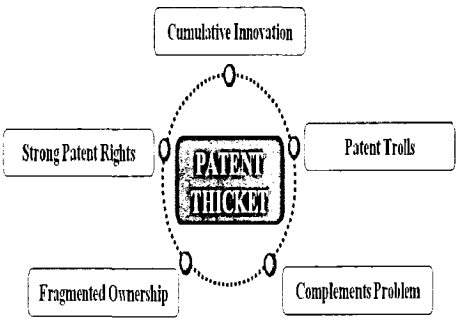
Patent thicket problems occur in part because of the sheer number of patent applications filed and granted. Since George Washington signed the first U.S. patent in 1790, issued to Samuel Hopkins for a new method of manufacturing potash [1], the number of patents has been increasing steadily and rapidly. During 2007 the United States Patent and Trademark Office (USPTO) received 484,955 patent applications to grant 182,899 of them. During the same period, the Korean Intellectual Property Office (KIPO), Korean equivalent of USPTO, received 247,915 patent applications to grant 167,245 of them. Under this circumstance, any company that commercializes new

product technology can hardly downplay the risk of patent infringement (see Figure 1).



〈Figure 1〉 Growth of patents applications filed and granted

In this section, we discuss several factors which johicly create patent thickets: cumulative nature of innovation, the problem of complements, the tragedy of anticommons, strong patent protection, non practicing entities (see Figure 2). These factors are not completely distinct notions, but they are somewhat interrelated and overlapping conceptually.



〈Figure 2〉 Factors creating patent thicket

2.1 Cumulative Nature of Innovation

The cumulative nature of innovation is well expressed by the famous phrase—popularized by Sir Isaac Newton—that every scientist "stands on the shoulders of giants" to reach heights. Today, most basic and applied researchers are effectively standing on top of a huge pyramid, not just on one set of shoulders [11].

The cumulative nature of research was well recognized also in Asia. Confucius once said, "Acquire new knowledge whilst thinking over the old (Chinese: 溫故而知新; on goh eui jishin). The crucial role of inference in innovation seems to have been much appreciated in the East as well as in the West.

Innovation is not a one time event. It is an ongoing process, with one invention frequently providing a building block for the next. The ongoing nature of innovation poses difficult questions about how best to preserve adequate incentives for an initial innovator and maintain adequate incentives to become the next innovator. Another difficulty is that the number of patents required for commercialization seems to have jumped. In the past, each invention often required access to only one or a few patents to commercialize the patented product. Nowadays, however, product commercialization tends to require access to many patents—dozens, hundreds, or even thousands. This phenomenon can increase transaction costs substantially and lead to additional problems such as royalty stacking [5].

2.2 The Problem of Complements

Two goods are complements if their value

to the consumer depends on having both of them available. An extreme example is left shoes and right shoes [14]. Antoine Augustin Cournot analyzed the strategic interactions between producers of complementary products, considering a market with two companies: a monopoly zinc producer and a monopoly copper producer. These two supplied a large number of other companies that combined the metals to produce brass [15]. In this situation, if the copper producer cuts its price, brass producers will buy more zinc, thereby increasing the profit of the zinc producer. But the zinc producer's additional profits are irrelevant to the copper producer, making it reluctant to cut its price too much. The result is that the copper producer sets a price that is higher than the price that would maximize joint profits. If, however, the copper and zinc producers merged, the merged entity would take into account that the price of copper affected the demand for zinc and set a lower price for both copper and zinc than independent producer would. In short, if the products are highly complementary, producers left to their own devices may set prices too high because of the "Cournot effect." The merge of two producers would make the producers themselves better off as well as the consumers.

The density of patent thicket is due to the fact that all the relevant patents are necessary—i.e., complementary to one another—regardless whether a particular patent contributes technologically to innovation significantly or not. The psychologist Sven Vanneste and the legal scholar Ben Depoorter showed that when something you own is necessary to the success of a venture, even if its contribution is small, you'll tend to ask for an amount close to the full value of the venture [12]. In this situation, there is a good chance that hold up and/or hold out problems will occur.

2.3 The Tragedy of Anticommons—Fragmented Ownership

The phrase tragedy of anticommons was coined by Heller [6], where the anticommons concept refers to fragmented ownership. Gridlock, resulting from anticommons, is a situation where market participants can't strike a deal so nobody can move forward. Gridlock is a paradox. Private ownership usually increases wealth, but too much ownership has the opposite effect: it wrecks markets, stops innovation, and costs lives. A tragedy of the anticommons can be a matter of life and death. For example, the explosion of patenting in biotechnology over the past twenty five years —particularly efforts to patent gene fragments —may be retarding drug development, by making it hard create a new drug without licensing myriad previous patents. The anticommons leads to underuse and waste. Considering the magnitude of damage caused by gridlock, assembling fragmented patent ownership can be great entrepreneurial opportunity because we can reclaim the innovation lost in a tragedy of the anticommons.

2.4 Strong Patent Protection

Industrial R&D is widely seen as a key driver of productivity and economic growth. Many believe that patent rights are essential to the protection of pay off to invention. This belief in the importance of patents and intellectual property protection has underpinned nearly a three decade trend towards strengthening of patent protection in the U.S. [4]. In 1982, the Court of Appeals for the Federal Circuit was established to make patent protection more uniform and indirectly strengthen it. Since then, patent

rates, plaintiff success rates in infringement suits and the number of infringement suits filed have all increased substantially.

The strong patent protection certainly has increased remarkably the number of patents which is a gauge of R&D successes. But the sheer number of patents, combined with cumulative nature of innovation and fragmented ownership, sometimes turn out to create patent thicket blocking efforts to commercialize valuable technologies. So it seems to be desirable to grant the least protection possible without destroying robust incentives for private investment and innovation. We should not let fragment owners create gridlock. Cutting edge technology can be rescued from gridlock by creatively adapting patent rights. As mentioned above, a century ago, at the height of laissez faire capitalism, such adaptations got the airplane industry off the ground. It is desirable to find the sweet spot for property rights, between commons and anticommons [6].

2.5 Rise of Non Practicing Entities—Patent Trolls

Non practicing entities (NPEs) are firms that patent their inventions but do not practice them, or buy patents from other companies (particularly bankrupt ones) not to practice but to assert against others. NPEs seek high royalty rates from locked in downstream actors—innovators or manufacturers. A downstream actors is locked in when it learns that it has infringed a patent only after it has committed sunk costs to its innovation and production. In that case, the patent owner may be in a position to demand supra competitive royalty rates [5].

In a sense, NPEs aim to hold up downstream actors. Hold up can injure innovation and competition. Such a demand for payment after lock in can compel the downstream actor to pay the patentee a far greater royalty rate. That higher rate can be passed along to consumers in the form of higher prices. Moreover, the threat of hold up may reduce overall levels of innovation, because some companies will refrain from introducing certain products for fear of hold up.

NPEs are conceptually similar with patent trolls (or sharks)—patent holding individuals or (often small) firms who trap R&D intensive manufacturers in patent infringement situations in order to receive damage awards for the illegitimate use of their technology [10]. Patent trolls can employ a hold up strategy without fear of retaliation. They obtain and enforce patents against other firms, but either have no product or do not create or sell a product that is vulnerable to infringement countersuit by the company against which the patent is being enforced [5].

3. Patent Pool

The basic idea of patent pool is to assemble fragmented patent ownership. Patent pools involve patents from multiple patentees licensed in a package, either by one of the patent holders or by a new entity established for this purpose, usually to anyone willing to pay the associated royalties. Voluntary patent pools seem to be one of the important potential solutions to concerns regarding patent thickets.

Patent pools have played an important role in shaping both the industry and the law in the U.S. [13]. In 1856, the Sewing Machine Combination formed one of the first patent

pools consisting of sewing machine patents. In 1917, as a result of recommendation of Franklin D. Roosevelt, an airplane patent pool was privately formed encompassing almost all airplane manufacturers in the U.S. The creation of the MAA was crucial to the U.S. government because the two major patent holders, Wright Company and Curtiss Company, had effectively blocked the building of any new airplanes, which were desperately needed as the U.S. was entering World War I. In 1924, an organization first named the Associated Radio Manufacturers, and later the Radio Corporation of America, merged the radio interests of American Marconi, General Electric, American Telephone and Telegraph (AT&T) and Westinghouse, leading to the establishment of standardization of radio parts, airway's frequency locations and television transmission standards. A more recent patent pool was formed in 1997, by the Trustees of Columbia University, Fujitsu Limited, General Instrument Corp., Lucent Technologies Inc., Matsushita Electric Industrial Co., Ltd., Mitsubishi Electric Corp., Philips Electronics N.V., Scientific Atlanta, Inc., and Sony Corp. to jointly share royalties from patents that are essential to compliance with MPEG 2 compression technology standard. In 1998, Sony, Philips and Pioneer formed a patent pool for inventions that are essential to comply with certain DVD Video and DVD ROM standard specifications. Yet another patent pool was formed in 1999, this time by Toshiba Corp., Hitachi, Ltd., Matsushita Electric Industrial Co., Ltd., Mitsubishi Electric Corporation, Time Warner Inc., and Victor Company of Japan, Ltd., for products manufactured in compliance with the DVD ROM and DVD Video formats.

The benefits of patent pools are as follows [13]: Firstly, the pooling of patents can eliminate the problems caused by blocking patents or royalty stacking. It was demonstrated in liberating the U.S. airplane industry from patent tangle. Secondly, patent pools can significantly reduce licensing transaction costs. Entities interested in a certain technology covered by a patent pool can, in one shop, license all the patents relevant to the technology. Not only does the process of individual licensing require more time, money, and resources, but it also establishes a motivation for some patent holders to hold out on licensing their patents. Thirdly, patent pools can distribute risks by enabling its members to share the risks associated with R&D. Finally, patent pooling provides a benefit of institutionalizing exchange of technical information not covered by patents by facilitating free sharing of technical information related to patented technology among its contributing members and its licensees.

Patent pools seem to work best when linked to an emerging technical standard designed to facilitate large scale technology licensing. The greatest successes have come in the electronics industry, where pools ensure interoperability of MP3 or DVD players [6].

Patent pools risk being challenged on antitrust grounds. To qualify for antitrust approval, a pool must assemble essential complementary patents, but it is not clear that biotech patents could meet this requirement. Even a remote prospect of facing trifle damages in a private antitrust suit makes firms hesitate. In the past decade, only handful major pools (MPEC 2, two DVD pools, and the 3G mobile wireless

platform) have solicited and obtained business reviews from the U.S. Department of Justice that give confidence they won't be sued on antitrust grounds [6].

There should be some evaluation mechanism by independent experts in patent pooling that can screen the candidate patents for a pool. For successful pooling of patents, it is necessary to encompass all the essential patents in the package. Otherwise, there will still remain the risk of infringement which may result in hold up. The patents in a pool should meet two conditions. The first condition is that the technologies covered by the patents should be complementary to one another. Inclusion of truly complementary patents in a patent pool is desirable and procompetitive, but assembly of substitute or rival patents in a pool can eliminate competition and lead to elevated license fees. Put differently, the key distinction in forming a patent pool is that between blocking or essential patents, which properly belong in the pool, and substitute or rival patents, which may need to remain separate. The second condition is that the patents should be not invalid. There is a concern that pools may shield invalid patents. Companies that fear that their patents will be invalidated in court are eager to settle by creating a patent pool. This, in turn, will force the public to pay royalties to technology that would have become part of the public domain if the patents were actually litigated in court [13].

4. Patent Valuation

Patent valuation is hardly obvious. However, it is needed for fair distribution of royalty among the patents involved in a pool. To be fair, the royalty distribution should be based on the relative technological contribution of a patent. To explain the fair royalty distribution based on technological contribution, we will take an imaginary example (see Figure 3). Let's suppose that we need to build new transmission line through 10 km of land from a wind power generator to the place where the power is consumed.. Also, suppose that the 10 km land is dividedly owned by three landlords, who hold 5 km, 4 km, and 1 km lands respectively. Since the grid can not bypass any part of the 10 km land, each landlord is in a position to demand prohibitively high rent so that the wind power project might lose the economic feasibility. Especially, there is a good chance that the 1 km landlord will require as high rent as the 5 km landlord does.

Obviously, rational and fair solution is that the total rent be distributed among the 3 landlords in the ratio of 5:4:1. By the same token, the total royalty should be distributed among patents in accordance with their relative technological contributions. In this example, we use the number of km as a metaphor for the relative technological contribution of a patent.

It is almost impossible to calculate the absolute dollar value of a patent accurately. Fortunately, however, what we need is a scheme to figure out the relative value of a patent—i.e., its relative technological contribution, which can be used as a basis for fair royalty distribution among patents. Among various patent valuation methods, the Rating/Ranking

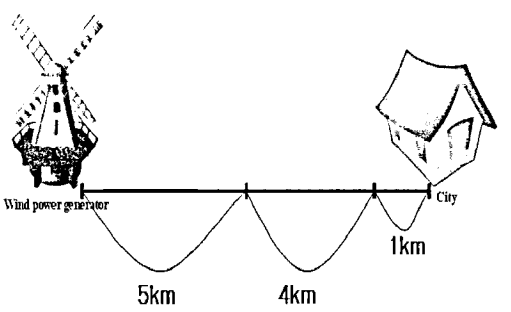
Method seems to fit to our purpose. The five elements that comprise the Rating/Ranking Method are: (1) scoring criteria, (2) scoring system, (3) scoring scale, (4) weighting factors, and (5) decision table [11]. Examples of criteria are market size, patent protection, and stage of development. As for scoring system, the most common one is the 1 to 5 point system, with 5 as the best, 1 as the worst. Two types of scoring scales can be used: subjective and objective. Subjective scales assign a score according to the selected scoring system, e.g., 1 to 5. Objective scales incorporate the past accumulated data of valuation experience into the scoring system. The weighting factor is used as a means of assigning relative importance to a criterion.

One of the critical steps in employing the Rating/Ranking Method is selecting appropriate criteria. We examined the scoring criteria suggested by the past research and selected a set of common criteria that seem to have more significant influence on patent value [7]. We present the scoring criteria employed in the patent valuation models of Korea's leading organizations: Korea Technology Transfer Center's (KTTC) technology competitiveness checklist model and Korea Invention Promotion Association's (KIPA) patent valuation model (see Table 1). Also we present those of several international organizations: The National Technology Transfer Center's (NTTC) Top Index Model, Dow Chemical's TF Method, and Inavisis Inc.'s Technology Valuation Management System (TVMS) model (see Table 2).

From those scoring criteria, we identified 14 scoring criteria which are more frequently employed by the organizations (see Table 3).

〈Table 1〉 Scoring criteria employed by Korean organizations

	Technological Aspects	Commercial Aspects
K I P A	Alternative technologies Complexity of technology Cost to avoid or engineer around Differentiation Geographic area Insurance value Intellectual property costs Legal strength Obsolescence potential Ongoing technology outlook Pioneering technology Special credentials obtained Special Credentials obtained Stage of the technology Strategic positioning Uniqueness of commercial advantage	Barriers to commercialization Capital Required for implementation Company expectation Competitive response Competitor impact Customer effect Customer willingness to pay Derivation sales Displacement potential Expected revenue Impact on other products Nature of expected revenue Right to use technology Royalty rates Time required for implementation Useful economy life Usefulness to others Usefulness to user
K T T C	Alternative technologies Complexity of technology Degree of competition Differentiation Imitation of technology Pioneering technology Quality of technology Royalty rates Stage of the technology Strategic positioning	Barriers to commercialization Competitive response Competitor impact Derivation sales Displacement potential Expected revenue Impact on other products Nature of expected revenue Time required for implementation Useful economy life



〈Figure 3〉 Metaphor of technical contribution

It is our hopeful expectation that the selected scoring criteria can be used in a standard scheme of patent valuation for fair royalty distribution in the patent pool approach to solve the patent thicket problem.

〈Table 2〉 Scoring criteria employed by international organizations

	Technological Aspects	Commercial Aspects
NTTC	Barriers to commercialization Capital Required for implementation Company expectation Cost to avoid or engineer around Customer effect Customer willingness to pay Derivation sales Expected revenue Impact on other products Intellectual property costs Nature of expected revenue Ongoing technology outlook Pioneering technology Royalty rates Special credentials obtained Stage of the technology Time required for implementation Useful economy life Usefulness to others Usefulness to user	Alternative technologies Competitive response Competitor impact Complexity of technology Differentiation Displacement potential Geographic Insurance value Legal strength Obsolescence potential Strategic positioning Uniqueness of commercial advantage
DOW CHEMICAI	Alternative technologies Complexity of technology Legal strength Patent learning value Pioneering technology Special credentials obtained Stage of the technology Technology value in use Uniqueness of commercial advantage	Barriers to commercialization Capital Required for implementation Competitive response Competitor impact Customer effect Customer willingness to pay Nature of expected revenue Strategic positioning Time required for implementation
TVMS	Alternative technologies Complexity of technology Pioneering technology Special credentials obtained Stage of the technology Technology application Technology completion Uniqueness of commercial advantage	Competitive response Competitor impact Differentiation Legal strength Positioning of technology Strategic positioning Uniqueness of commercial advantage

〈Table 3〉 Common scoring criteria

Technological Aspects	Commercial Aspects
Alternative technologies	Barriers to commercialization
Complexity of technology	Competitive response
Differentiation	Competitor impact
Pioneering technology	Legal strength
Special credentials obtained	Nature of expected revenue
Stage of the technology	Royalty rates
Strategic positioning	Time required for implementation

5. Conclusions

In this paper, we discussed the factors causing patent thickets, patent pool which is a promising solution for the patent thicket problem, and a patent valuation scheme to figure out a patent's relative technological contribution for fair royalty distribution among the patents in a pool.

Innovation is the main driver of economic growth. However, cumulative nature of innovation, complements problem, fragmented patent ownership, strong patent protection, and rise of non practicing entities jointly create patent thickets. Sometimes, follow on innovation and production depends on access to patents that are economically infeasible to license because they are too numerous to license individually or even to learn about. Unless downstream actors—whether innovators or manufacturers—can mitigate the problem, they may have to choose between the risk of being sued for infringement after they sink costs into invention or production, or dropping innovative or productive efforts altogether. Either option can injure economic welfare [5].

Patent pool is an important mechanism for enabling widespread use of new technologies that require access to a multitude of patents dispersed among a multitude of parties. The basic idea of patent pool is to assemble fragmented patent ownership. The pooling of patents can eliminate the problems caused by blocking patents or royalty stacking. Its usefulness was demonstby bd in libeby ing the U.S. airplane industby from patent tangle. Also, patent pools can significantly as uce licensing transaction costs. Entities interes bd in a certain technology covered by a patent pool can, in one shop, license all the patents relevant to the technology. Another benefit of patents pool is to distribute risks by enabling its members to share the risks associated with R&D.

Patent valuation is necessary for fair distribution of royalty among patents involved in a pool. To be fair, the royalty distribution should be based on the relative technological contribution of a patent. Among various patent valuation methods, the Rating/Ranking Method seems to fit to our purpose of figuring out the relative technological contribution. One of the critical steps in employing the Rating/Ranking Method is selecting appropriate scoring criteria. In this paper, we examined various patent valuation models from leading organizations that carry out technology valuation, identifying 14 common scoring criteria which seem to be more influential to patent's value. It is our hopeful expectation that the selected scoring criteria can be used in a standard scheme of patent valuation for fair royalty distribution in the patent pool approach to solve the patent thicket problem.

References

[1] BusinessWeek(2005), Mining the vein of great ideas.

[2] BusinessWeek(2004), Spinning the orld's Web.

[3] BusinessWeek(2008), They make jobs, not widgets.

[4] Cohen, W., Nelson, R., and Walsh, J. (2000), Protecting their intellectual assets: appropriability conditions and why U.S. manufacturing firms patent (or not). Working Paper. National Bureau of Economic Research.

[5] Federal Trade Commission(2003), To promote innovation: the proper balance of competition and patent law and policy.

[6] Heller, M.(2008), Gridlock economy. Basic Books.

[7] Korea Invention Promotion Association(2004), A study on development of standard model for patent valuation.

[8] Nasaw, D.(2006), Andrew Carnegie. The Penguin Press.

[9] Razgaitis, R.(2003), Valuation and pricing of technology based intellectual property. John Wiley & Sons, Inc.

[10] Reitzig, M., Henkel J., and Heath C.(2007), On sharks, trolls, and their patent prayunrealistic damage awards and firms' strategies of "being infringed". Research Policy 36 (2007) pp.134-154.

[11] Shapiro, C.(2001), Navigating the patent thicket: cross licenses, patent pools and standard setting. Innovation Policy & the Economy, Vol. 1, Issue 1, (Apr. 2001), MIT Press.

[12] The New Yorker(2008), The permission problem.

[13] United States Patent and Trademark Office.(2000), Patent pools: a solution to the problem of access in biotechnology patent? DOI=

http://www.uspto.gov/web/offices/pac/dapp/opla/patentpool.pdf
[14] Varian, H.(2000), Paying complements. Article. University of California at Berkeley. DOI= http://people.ischool.berkeley.edu/~hal/Articles/TheStandard/complements.html
[15] Varian, H.(2001), In Europe, G.E. and Honeywell ran a foul of 19th century thinking. New York Times. DOI=http://people.ischool.berkeley.edu/~hal/people/hal/NYTimes/2001 06 28.html
[16] http://stats.oecd.org/glossary
[17] http://www.uspto.gov

Seong-Taek Park

2003 Chungbuk National University, M.B.A in MIS
2010 Chungbuk National University, Ph.D. in MIS

2006~Present Part Time Lecturer (Chungbuk National University, Sunmoon University, Hongik University)
Research Areas : IT & Business, Patent Valuation, Patent Management Strategy, e-learning, Ubiquitous Computing
E-Mail : solpherd@cbnu.ac.kr

Young-Ki Kim

1978 Seoul National University
1987 Univ. of Iowa, M.B.A
1992 Univ. of Iowa, Ph.D. in MIS
1993~Present Professor in MIS at the college of Business, Chungbuk National University
Research Areas : IT & Business, Patent Valuation, Patent Management Strategy, e-learning, Ubiquitous Computing
E-Mail : ykkim@cbnu.ac.kr

Seung-Jun Lee

2008 Chungbuk National University, M.B.A in MIS
2008 Ph.D. Candidate, Graduate School of MIS, Chungbuk National University
Present Assistant in Research Institute for Industry and Management (Chungbuk National University)
Research Areas : IT & Business, Patent Valuation, Patent Management Strategy, e-learning, Ubiquitous Computing
E-Mail : check81@cbnu.ac.kr

특허풀에서의 공평한 로열티 분배를 위한 특허가치평가

김영기 · 박성택 · 이승준

요 약

본 논문에서는 특허풀 내에서 공평한 로열티 분배를 위한 특허가치평가 방안에 대하여 살펴보고자 한다. 지식기반경제에서는 지적재산, 즉 축적된 기술과 노하우가 기업의 경쟁력과 국가의 경제성장의 가장 중요한 원천으로 인식되고 있다. 특허제도는 특허권자에게 독점적인 권리를 부여함으로써 기술혁신, 즉 새로운 기술의 발명과 상업화를 촉진시켜 궁극적으로 삶의 수준을 향상시키는 것을 목표로 하고 있다. 하지만 특허권의 숫자가 증가하고 특허권의 소유가 분산되면서 나타나는 특허제도의 문제점들이 기술혁신 의욕을 저하시키고 있다. 이에 대한 유망한 해결책으로 특허풀이 제시되고 있으며, 1차 세계대전 당시 미국정부가 특허풀을 결성하여 항공기 관련특허를 모든 생산업체들에게 라이선스함으로써 항공기 산업을 활성화시킨 사례가 있다. 특허풀의 원활한 운영을 위해서는 특허풀에 참여하는 특허들의 기술적 기여도를 평가하여 특허권자들에게 공평하게 로열티 수입을 분배할 필요가 있다. 이러한 특허가치평가에는 Rating/Ranking 방법이 적절한 것으로 보인다. 본 논문에서는 여러 특허가치평가 기관들의 평가모형들을 살펴보고 Rating/Ranking 방법에 활용될 수 있는 주요한 평가항목들을 추출하였다.

주제어 : 지식기반경제, 혁신, 특허풀, 특허가치평가