

2011 Modularization of Korea's Development Experience

Korea's Intellectual Property Rights System and its Application to the Phases of Industrial Development : Focusing on the Patent System

2012

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Prepared by	Korea Institute of Intellectual Property (KIIP)
Author	Jeeyoun Shin&Juyeon Lee, Korea Institute of Intellectual Property (KIIP)
Advisory	Tae Chang Choi, Representative Patent Attorney of Able Patent Law Firm
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Preface

The study of Korea's economic and social transformation offers a unique opportunity to better understand the factors that drive development. Within one generation, Korea had transformed itself from a poor agrarian society to a modern industrial nation, a feat never seen before. What makes Korea's experience so unique is that its rapid economic development was relatively broad-based, meaning that the fruits of Korea's rapid growth were shared by many. The challenge of course is unlocking the secrets behind Korea's rapid and broad-based development, which can offer invaluable insights and lessons and knowledge that can be shared with the rest of the international community.

Recognizing this, the Korean Ministry of Strategy and Finance (MOSF) and the Korea Development Institute (KDI) launched the Knowledge Sharing Program (KSP) in 2004 to share Korea's development experience and to assist its developing country partners. The body of work presented in this volume is part of a greater initiative launched in 2007 to systemically research and document Korea's development experience and to deliver standardized content as case studies. The goal of this undertaking is to offer a deeper and wider understanding of Korea's development experience with the hope that Korea's past can offer lessons for developing countries in search of sustainable and broad-based development. This is a continuation of a multi-year undertaking to study and document Korea's development experience, and it builds on the 20 case studies completed in 2010. Here, we present 40 new studies that explore various development-oriented themes such as industrialization, energy, human capital development, government administration, Information and Communication Technology (ICT), agricultural development, land development and environment.

In presenting these new studies, I would like to take this opportunity to express my gratitude to all those involved in this great undertaking. It was through their hard work and commitment that made this possible. Foremost, I would like to thank the Ministry of Strategy and Finance for their encouragement and full support of this project. I especially would like to thank the KSP Executive Committee, composed of related ministries/departments, and the various Korean research institutes, for their involvement and the invaluable role they played in bringing this project together. I would also like to thank all the former public officials and senior practitioners for lending their time and keen insights and expertise in preparation of the case studies.

Indeed, the successful completion of the case studies was made possible by the dedication of the researchers from the public sector and academia involved in conducting the studies, which I believe will go a long way in advancing knowledge on not only Korea's own development but also development in general. Lastly, I would like to express my gratitude to Professor Joon-Kyung Kim for his stewardship of this enterprise, and to his team including Professor Jin Park at the KDI School of Public Policy and Management, for their hard work and dedication in successfully managing and completing this project.

As always, the views and opinions expressed by the authors in the body of work presented here do not necessarily represent those of KDI School of Public Policy and Management.

May 2012

Oh-Seok Hyun

President

KDI School of Public Policy and Management



Prologue

The shift to a knowledge-based economy was foretold by thinkers such as Peter Drucker and Alvin Toffler. While traditional factors of production such as capital and labor were key sources of economic growth in the 20th century, the 21st century is a knowledge-based economy, where information and knowledge are the key economic resources that lead the growth of the global economy. Under this new economic paradigm, intellectual property rights (IPRs) are recognized as the key driver for economic development. Now, an increasing number of countries in the world are competing with one another to effectively generate, utilize and protect IPRs for their economic growth. Against this backdrop, IPRs have emerged as the key issue of national development policy.

Especially, IPR became an issue of importance for all countries engaged in the global market after the WTO TRIPs Agreement was signed in 1994. Because the TRIPS Agreement requires members to comply with certain minimum standards for IPR protection, all participating WTO member countries had to modify their IPR regimes and policies in compliance with TRIPs. Events of this kind that have a global impact will continue to take place in the future as well. In fact, the world's major advanced countries, which took the lead in the standardization of international IPR systems as part of the TRIPS Agreement, have actively participated in bilateral agreements such as FTAs and have influenced international IPR norms.

In that international IPR environment, Korea's IPR system has been modified and developed. Korea has modified its legal IP regimes and IP policies, taking the international challenges into consideration. It is said that Korea's IPR system has successfully been modernized in response to the changes in circumstances. Now, Korea is recognized to have a well-functioning IPR system that fosters technological development and economic growth (KIPO&WIPO, 2003). The development experience of Korea's IPR system holds positive implications for developing countries that have recently joined or will soon join the international community through WTO/TRIPS or FTAs. Korea's experience can shed light on how they could respond to global IPR trends and manage their own systems.

To introduce Korea's experience of IPR development to developing countries, this paper tries to enhance the understanding of the development process of Korea's IPR system by presenting individual events such as the enactment of new laws and establishment of new institutions in detail. Commencing from the year 1908, when Korea's first IP law was enacted, this paper will examine various institutions and policies that characterizes the development of the IPR system in Korea; there will be detailed explanations on the advantages and their effects in each specific case. What happened in Korea would serve as a great reference for developing countries in designing their own IPR systems.

Korea Institute of Intellectual Property Right

December 2011

Contents | LIST OF CHAPTERS

Prologue.....	4
---------------	---

Summary	14
---------------	----

Chapter 1

Introduction	19
1. Existing Discussions on the IPR System and Industrial Development	21
2. Observation of Korea's IPR System in the Context of Industrial Development.....	25
2.1 1960s to Mid 1970s.....	27
2.2 Mid 1970s to Mid 1980s.....	27
2.3 Mid 1980s to Late 1990s.....	29
2.4 Post-Financial Crisis ('98) to the Present	30
3. Proposing Three Developmental Phases of Korea's IPR System.....	31

Chapter 2

The First Developmental Phase of Korea's IPR System: Introduction Period (1900s-70s).....	37
1. Overview of the Introduction Period.....	38
2. Outline of Patent System&Policy.....	40
2.1 Efforts to Stabilize the Patent System: Utility Model Introduction.....	40
2.2 Efforts to Promote Invention: Introduction of the Employee Invention Compensation System	44
3. Major Details of Patent Administration and Infrastructure.....	48
3.1 Efforts to Stabilize Patent System: Patent Attorneys Association	48
3.2 Efforts to Modernize the Patent Administration: Launch of the Korean Intellectual Property Office	49

Chapter 3

The Second Developmental Phase of Korea's IPR System: Settlement Period (1980-late 1990s)	55
1. Overview of the Settlement Period (Second Period: from 1980 to the late 1990s)	56
2. Major Details of Patent System and Policy	58
2.1 Efforts to Integrate into the International System: Joining International IP Communities	58
2.2 Efforts to Strengthen Patent Rights at the International Level: Introduction of Substance Patents	61
3. Administration Institutes and Infrastructure for Patents	67
3.1 Efforts to Nurture International Human Resources: Establishment of the International Intellectual Property Training Institute	67
3.2 Efforts for Flexible Responses for International Systems: Operation of an Independent Profit System	69

Chapter 4

The Third Developmental Phase of Korea's IPR System: Advancement Period (late 1990s-Present)	71
1. Overview of the Advancement Period	72
2. Execution of Patent Institutions and Policies	73
2.1 Efforts for Advanced Patent Administration: Introduction of the E-application System	73
2.2 Efforts to Enhance Efficiency of the Examination System: The Three-Track Examination System	77
3. Restructuring of Patent Administration and Infrastructure	80
3.1 Efforts to Improve IPR Trial System: Establishment of the Patent Court	80
3.2 Efforts to Vitalize Technological Information for Patents: Establishment of KIPI	81



Contents | LIST OF CHAPTERS

Chapter 5

Evaluation and Implications.....	85
1. Three Keys to Korea's Success	87
1.1 Efforts for Promoting IPRs Activities.....	87
1.2 Active Leadership of Governmental Office in Charge of IPR	89
1.3 Effective Management of IPR Procedures	90
2. Discussion on Limitations.....	91
2.1 Quantitative Growth Rather Than Qualitative Growth	91
2.2 Protection Scope of Patents: Introduction of Substance Patent	92
2.3 Patent Examination	93
3. Closing Remarks	95
References.....	97
Appendix	100

Contents | LIST OF TABLES

Chapter 1

Table 1-1 Types of IPR	23
Table 1-2 Industrial Development in Korea, Divided into Four Periods	26
Table 1-3 Technology Transfer (1962-1993).....	28
Table 1-4 Three Developmental Phases of Korea's IPR System	32
Table 1-5 History of IPR Legal System in Korea	33

Chapter 2

Table 2-1 Trends of Major IPR Variables in Korea.....	39
Table 2-2 Total Issuance of Utility Model&Patent in Korea (Locals + Foreigners).....	42
Table 2-3 Progress of Employee Invention in Korea (2002-2006)	46
Table 2-4 History of the Patent Attorney System	48
Table 2-5 The number of people who pass the patent bar exam (1945~1980).....	49
Table 2-6 Examination disposals or pending applications (1973-76).....	50

Chapter 3

Table 3-1 Trends of Major IPR Variables in Korea.....	57
Table 3-2 Status of Joining Conventions Related to Patent (as of August 2011)	59
Table 3-3 Establishment of Corporate R&D Centers by Year and Field.....	63
Table 3-4 Statistics of Application for Substance Patents	64
Table 3-5 Foreign Direct Investment (FDI) by Domestic Manufacturing Areas.....	65
Table 3-6 KIPO Budget Developments from the Introduction of Special Accounting Plan to Financial Independency (1988-1998).....	70



Contents | LIST OF TABLES

Chapter 4

Table 4-1 Trends of Major IPR Variables in Korea.....	72
Table 4-2 Increasing Trend of E-application (1999-2006)	76
Table 4-3 International Comparison of E-application Rate (%).....	76
Table 4-4 Accomplishment of KIPOnet (1999-2006)	76
Table 4-5 Scope of Information Available through KIPI Service	83

Chapter 5

Table 5-1 Best Practices	87
Table 5-2 Trade Balance of Payment of Korea.....	92
Table 5-3 Experiences of Examiners and Judges prior to their Appointment as Appellate Administrative Judges.....	94
Table 5-4 Reversal Rate for the Appellate Administrative Judges' Decision at the Supreme Cour	94

Contents | LIST OF FIGURES

Chapter 1

Figure 1-1 Total R&D cost in Korea	29
Figure 1-2 Number of patent applications by domestic and foreign applicants filed in Korea (1960-2010).....	30

Chapter 2

Figure 2-1 Firms Implementing Employee Invention Compensation System	45
Figure 2-2 Progress of Patent Applications by Applicants (Firms, Individuals).....	47
Figure 2-3 KIPO's Organization.....	52

Chapter 3

Figure 3-1 Cases of Technology Transfer in Chemical Industry.....	65
Figure 3-2 Cases of Technology Transfer in Pharmaceutical Industry	66

Chapter 4

Figure 4-1 Application Procedure Using KIPONet	74
Figure 4-2 Changes in KIPO's Services after Introduction of KIPONet	75
Figure 4-3 Number of Patent and Utility Model Applications by Local Residents and Foreigners in Korea (1960-2010)	78
Figure 4-4 Track Examination System (Customer-tailored Patent Examination System)	79
Figure 4-5 Current Patent Judiciary System	80
Figure 4-6 Virtuous Circle of R&D and Patent Information Utilization	81

Summary

Korea, once one of the poorest nations in the world, is currently among one of the world's 15 largest economies by its GDP standards of 2010. Such an unprecedented growth has generated voluminous literature about what were the key factors for Korea's economic growth. With many discussions being devoted to the question of whether stronger IPR protection promote or deter economic growth or industrial development, it would not be easy to assess the role of IPR system in industrial development in Korea. Contributions in this area in the context of Korea include KIPO&WIPO (2003), Lee&Kim (2010), and Kim et al. (2011), which stressed the significance of the intellectual property right (IPR) system in imitating advanced technology from foreign countries and thereafter developing local technological capacity.

While recognizing the contribution of understanding a country's economic growth from the perspective of the IPR system, this paper departs from the approaches taken in existing studies. The existing discussions attempted to find out the relationship between the role of IPR system and technological/industrial development, i.e. whether a stronger IPR system would have a positive or adverse effect on industrial development. However, such examinations would be insufficient for policy makers in developing countries faced with various circumstances, whose decisions are not simply about whether to strengthen or weaken the levels of IPR protection. In order for the policy makers to design their own IPR systems and policies, they need to refer to a detailed mechanism in which Korea's IPR system and policies have been shaped responding to changing circumstances.

Faced with various challenging situations, policy makers in developing countries need to have ample references to consult in their policy-making decisions-including a list of pros/cons of certain policy options, precautionary measures, etc. Since such references can be produced only through detailed, micro-level examinations on how the IPR system in a given country has developed responding to various circumstances, we will take the case of Korea's IPR system to examine how a country's IPR system has changed through active

policy choices responding to various circumstances. The utility model system is a good example of active policy choice, for example, which will be discussed in detail later in this paper. Korea used the utility model system as a tool for encouraging indigenous inventive activities in the early stage of industrial development. Back to the time the utility model system was introduced in the 1960s, Korea had low levels of technological capability, and a patent-which requires high level of inventiveness-was an inappropriate form of protection for domestic inventions.

Thus, this paper chronologically examines the development of Korea's IPR system. Instead of simply describing a list of changes that occurred in Korea's IPR system, our discussion will emphasize the background against which the changes took place and reasons underlying the changes. As such, policy makers in other countries are expected to learn from this paper the policy choices Korea has made over the last four decades in implementing its IPR system when faced with various circumstances. To better understand the process of the IPR system development in Korea, this paper proposed dividing the process into three developmental phases: the introduction period (the first developmental phase: 1900s~70s), the settlement period (the second developmental phase: 1980s-late 1990s), and the advancement period (the last developmental phase: late 1990s-present).

The "introduction" period (first phase) starts from the time when the first IPR system was introduced in 1908. During this period, the patent system was modernized and stabilized in the country, which stimulated domestic technology development activities. The "settlement" period (second phase) is the period when Korea's IPR system became more globalized and strengthened to meet global standards along with the rapid development of technological capability. During this period, the overall organization of Korea's IPR system was modernized and developed as a response to external pressures such as Section 301 of the U.S. Trade Act of 1985 and the World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Agreement. In addition, government officials actively brought the changes into the IPR system in order to integrate the system into an international system. The last period is the "advancement" phase of the IPR system's development (late 1990s-present), when the country promoted strategic policies for active application of the IPR system. Korea's competency for technological innovation nearly reached the level of advanced countries in the late 1990s and sound performance of patenting activities were observed. Against this background, the government pursued strategic IPR policies aimed at building highly efficient operations of the IPR system.

Undergoing the three developmental phases, Korea now is recognized to have a well-functioning IPR system to foster technological development and economic growth (KIPO&WIPO, 2003; Lee&Kim, 2010). The question then arises whether Korea's success is transferable to other countries. Certainly, experiences of Korea are unique to Korea, and countries wishing to benchmark the success of Korea are neither able to nor need to emulate the exact steps taken by Korea. In fact, scholars have noted that an IPR system's effectiveness for industrial development depends on a country's unique characteristics that contribute to

or detract from the country's success (Fink and Maskus, 2005; Maskus, 2000). However, the points to be taken from Korea's experience are not its IPR system itself but rather the process in which the IPR system has developed responding to external circumstances. Thus, this paper attempted to present in what context certain features in Korea's IPR system have been made: what challenges Korea faced in operating the IPR system; which decisions or efforts government officers made in response to the challenges; which effects were brought by the measures, laws, or policies taken, etc.

This paper found three key factors that characterized the development process of Korea's IPR system. The first key to success is the Korean government's big effort to promote indigenous inventive activities. As was in Korea's case, at the earlier stage of the introduction of the IPR system in developing countries, the level of technology would be greatly lower than that of advanced countries. Due to the low level of indigenous technological capacity, people in developing countries could hardly develop their own technology that would require a patent, which requires a high level of inventiveness. Thus, it is first necessary to reinforce people's awareness and encourage IPR-generating activities through the introduction of a utility model system, which awards IP rights to inventors of small inventions that do not qualify for patent rights. In addition, it is imperative to establish an invention-oriented atmosphere to promote IPR-generating activities by the adoption of "Employee Invention Compensation System." This system recognizes ownership of employers on the IPRs from their employees' inventions while providing the employees with compensation for their inventions in return. Being assured that they would own successful inventions created in the workplace, firms were encouraged to invest in R&D and IPR-generating activities. The role of the Korean government was huge in establishing the "Employee Invention Compensation System"; it implemented promotional activities including holding seminars and publishing guidelines, integrating the system into industry.

The second key is the active leadership of government office for IPRs. The Korean Intellectual Property Office (KIPO), a central governmental office for IPR, has been an integral component in Korea's successful growth. Since the reestablishment of KIPO as an independent IP office, Korea's IPR system for technological/industrial development has been effectively modernized with the help of the comprehensive role of KIPO.¹ For example, KIPO itself could push forward "the modernization plan" for the advancement of IPR administration in a more effective way. By getting funds from the UNDP in 1978, KIPO could successfully accomplish its modernization plan from the period of 1980-1986, and thus establish the advanced IPR administration. Successful implementation of numerous IP policies (or projects) by KIPO could be attributable to KIPO's special accounting plan, which allows KIPO's operation on independent revenues from IPRs application fees. With

¹ KIPO's role in facilitating the use of the IPR system to promote development far exceeds that of other intellectual property offices. While most patent office see their functions limited largely to patent examination, patent promotion, administration of the patent laws, such as the United States Patent and Trademark Office (USPTO), KIPO sees its functions as supporting technological development through direct interaction with private sectors [e.g. firms, individual inventors].

KIPO's budget independency,² Korea was better able to effectively operate IP policies to support and protect domestic industries. Furthermore, KIPO was able to establish three sub-organizations of KIPO thanks to the independent budget system: the International Intellectual Property Training Institute, the Korean Invention Promotion Association, and the Korean Institute of Patent Information. These three affiliates have played as a key capacity builder for indigenous innovations as they formed highly effective partnerships with the private sector in all aspects of IPR activities, from R&D to commercialization of technology, and to enforcement of IPRs. Thus, it is recommended that IP offices in developing countries consider establishing their IP office's independent budget, so that the IP office has a stable budgetary ground to pursue efficient IP policies for industrial and technological development and to make proactive, timely responses to the changes in international IP environments.

The third key is the effective management of IPR procedures. To further facilitate the activities of creation, commercialization, utilization, and protection of IPRs, Korea's E-application system called 'KIPOnet' can be recommended. KIPOnet is an office automation system that enables complete electronic management of IPR procedures such as patent application, registration, and examination. It provides applicants with a breadth of electronic services such as on-line filing and patent information searches. In Korea, the KIPOnet system successfully increased KIPO's efficiency in patent administration without necessitating the transfer of paper wrappers. Recently, the customized systems of KIPOnet have been developed and provided to developing countries in line with their IT competency. The introduction of such a program in developing countries would enhance the efficiency of the patent administration as well as IPR-generating activities. Along with the introduction of the E-application system, the Three-Track examination system is recommended as the IPR examination system for developing countries. Under this system applicants are no longer obliged to accept a uniform examination period; depending on their IP strategy, they can choose one of the following three examination tracks: accelerated, regular, or customer-deferred. The system has been so highly appreciated; for example, the United States uses it for the protection of applicants' rights.

Admittedly, Korea still has problems that need to be resolved in making its IPR systems and policies operational. While the generation of IP has been actively promoted as one of the core dynamics for economic growth, quantitative growth has been the main focus, resulting in less qualitative performance to strengthen industrial and technological competitiveness. Additionally, despite KIPO's intense efforts to reduce, examinations and trials still need to be qualitatively improved. Another problem arose, whereby, owing to the passivity shown by the Korean government during the U.S.-Korea trade negotiations, most of the demands made by the United States, including the partial introduction of substance patents in 1987, were accepted. In Korea, the introduction of substance patents promoted R&D activities

² With the Patent Management Special Accounting program initiated in 1987, KIPO obtained its budget independency.

of related industries, as well as patent generation; however, since the late 1990s, there has been an issue with the consistent increase of market share of foreign pharmaceutical firms. When substance patents are allowed in developing countries with almost non-existent pharmaceutical or chemical industries, foreign medicine and agricultural chemicals have to be imported at higher prices, and high royalties have to be paid to foreign licensors, resulting in a heavier burden on the economy. Hence, the question as to whether it is desirable to delay the introduction of a substance patent system as much as possible should be prudently considered.

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Chapter 1

Introduction

1. Existing Discussions on the IPR System and Industrial Development
2. Observation of Korea's IPR System in the Context of Industrial Development
3. Proposing Three Developmental Phases of Korea's IPR System

Introduction

Korea's GDP was USD 986.2 billion and is currently among one of the world's 15 largest economies. While the country was once one of the poorest nations in the world after it underwent the Korean War (1950-53), it has recorded profound growth since then. Korea's economic growth is often applauded as success and has generated voluminous literature on the key factors for Korea's economic growth. Many studies have focused on the key role of technological development in Korea's economic growth (Lee et al., 1988; OECD, 1996; Kim, 1997). They argued that technological development resulted from the internalization of technology imported from advanced nations. Recently, KIPO&WIPO (2003), Lee&Kim (2010), and Kim et al. (2011) stressed the significance of the intellectual property right (IPR) system in imitating advanced technology from foreign countries and thereafter developing local technological capacity.

While those previous studies contributed to understanding Korea's economic growth from the perspective of the IPR system, the question of "then what?" remains unresolved for policy makers in countries wishing to benchmark Korea's success. For example, Lee&Kim (2010) provided excellent findings that a weak IPR protection in Korea during its early stage of industrial development became gradually stronger as the country's technological capacity improved, and that the weaker IPR protection was appropriate when Korea's technological capacity did not reach high levels. However, such general or macro-level examinations on the role of the IPR system would be insufficient for policy matters.

In order for the policy makers to come up with their own IPR systems and policies, they need to refer to a detailed mechanism in which Korea's IPR system and policies have been shaped as a response to changing circumstances. Faced with various challenging situations, policy makers in developing countries need to have ample references when making their policy decisions-including a list of pros/cons of certain policy options, precautions to be taken, etc. Since such references can be produced only through detailed, micro-level

examinations on how the IPR system in a given country has developed through various circumstances, we will take the case of Korea's IPR system to examine how a country's IPR system changes through active policy choices formulated for various circumstances. The utility model system is a good example of active policy choice, which will be discussed in detail later in this paper. Korea used the utility model system as a tool for encouraging indigenous inventive activities in the early stage of industrial development. At the time the utility model system was introduced in 1961, patents, which require a high level of inventiveness, were not regarded as the appropriate system for Korea, which still had low levels of technological capability.

Thus, this paper will chronologically examine the development of Korea's IPR system. Instead of simply describing a list of changes that occurred in Korea's IPR system, our discussion will emphasize the background against which the changes took place and reasons underlying the changes. As such, policy makers are expected to learn from this paper the policy choices Korea has made over the last four decades in implementing its IPR system when faced with various circumstances.

Overall, this chapter will give an explanation of how Korea has fine-tuned her IPR systems as per her developmental requirements for economic growth. Before this paper discusses the course in which the IPR system in Korea has changed in detail in Chapter 2 to 4, Chapter 1 is devoted to a brief review of existing discussions on the IPR system and industrial development made in the general sense (1.1) and in specific context of Korea (1.2). The review of the existing discussions will make a clear distinction between the current paper and existing discussions. Like other studies which discussed the IPR system within the context of industrial development, this paper will look at the levels of industrial development in Korea. Unlike other studies, however, this paper regards the levels of industrial development as an external environmental factor which affected the changes.

In this paper, the term "IPR system" is used in a broad sense to refer to a system of legal regimes for intellectual property rights and related policies. While there is no legal definition or consensus among scholars, laws generally achieve their intended goals when implemented along with related policies. Therefore, the legal regimes for intellectual property rights and related policies in Korea are considered together under the term "IPR system" in this paper.

1. Existing Discussions on the IPR System and Industrial Development

Before presenting existing discussions on the IPR system and industrial development, it will be helpful to briefly explore different types of IPRs. It would be misleading to group the different types of IPRs and treat them all simply as IPRs: IPRs protect different forms of subject matter and contribute to industrial development in different ways.

Intellectual Property, as a subject matter of IPR, is defined to be creations of the mind: inventions, literary and artistic works, symbols, names, images, and designs used in commerce. In other words, it is a creation which results from intellectual activity in the industrial, scientific, literary, and artistic fields. The Convention Establishing the World Intellectual Property Organization (1967) gives the following list of subject matter protected by intellectual property rights:

- Literary, artistic and scientific works;
- Performances of performing artists, phonograms and broadcasts;
- Inventions in all fields of human endeavor;
- Scientific discoveries;
- Industrial designs;
- Trademarks, service marks, and commercial names and designations;
- Protection against unfair competition;
- All other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields.

IPRs protect the interests of creators by giving them property rights over their creations. Traditionally, the IPRs are divided into two branches, “industrial property right” and “copyright”, but the scope of IPRs is becoming broader to include new types of rights: rights for protecting semiconductor integrated circuit designing, new varieties of plants, trade secrets, and geographical indications. Therefore, IPRs can be grouped into the following three areas: “industrial property rights”, “copyrights”, and “new types of IPRs” (Yun, 2011). The “new types of IPRs” are separately classified to show the new types of IPRs which do not fit comfortably into the traditional categories. While the table provides a brief explanation of the types of IPRs, it does not reflect the detailed variances in intellectual property law regimes among countries, particularly given the differences in the way the new types of IPRs are protected.

Table 1-1 | Types of IPRs

Types of IPRs		Subject Matter of Protection
Industrial Property Right	Patent	core technologies, technological creation (major inventions)
	Utility Model	relevant/improved technologies practical and on a short life-cycle (micro-inventions)
	Design	aesthetic shapes/forms of products
	Trademark	marks/letters/figures distinguishing
Copyright	Copyright	literature and artistic creations
	Related Right	rights of performers, record producers, broadcast industry operators
New types of IPR	IC Layout Design rights	integrated circuit I(IC) layout design
	Plant Breeder's Right	new variety of plants
	Right under Trade Secret Law	trade secret and undisclosed information
	Right under GI Law	geographical indications

Source: Reconstructed based on Yun (2011, 3)

Considering that an intended function of IPRs is to foster investments in competition but not to prevent fair entry (Marcus 2000, 21), every IPR will affect industry development in certain ways. However, patent is the topic of interest in our paper, of the various types of IPRs, because it protects technology and will significantly affect industrial development. In fact, discussions on IPRs in the context of industrial development have been made with a heavy focus on technology. One view presents negative impacts of IPRs on industry development for the reason that IPRs deter local firms from imitating and building on the advanced technologies of foreign firms. However, the opposing view is that IPRs induce firms to trade and license their technologies and products more readily, enhancing their diffusion into the economy (Marcus 2000, 8). Those arguments suggest that patent, as a system for technology protection, is a main factor in the context of industrial development. This is also supported by Park and Kim (2002), who point out that the patent system has been a core industrial policy for industrial and economic growth. Thus, we will focus on the patent system in exploring existing discussions on the IPR System and industrial development.

The justifications for a patent system from an economic perspective can find its origin from the theory of J. A. Schumpeter, who in 1949 first discussed the relationship between technological innovation and industrial/economic development. Schumpeter argued that it is necessary to guarantee a monopolistic profit as a return for innovation activities in order to continually encourage the development of new products and technologies. His point was in the long term a monopolistic profit would facilitate technology sharing through technology supplier-buyer relationships, spreading innovation throughout the entire economy. In this context, for the long term, patent, which guarantees a monopolistic position for a certain time, serves as a strong incentive for inventors to introduce more technologies, products, and inventions into the market place, resulting in a driving force for the economy (Nordhaus, 1969).

As the endogenous growth theory, which highlighted the significance of technological knowledge in economic growth, emerged in the 1980s, many empirical studies were conducted to see if stronger patent rights could actually facilitate technological innovation and sustainable economic growth. For example, Gould&Gruben (1996), analyzing the correlation between economic growth and patent right enforcement, suggested a positive correlation between them. Yeon (2003) argued that the increasing number of IPRs led to the higher total factor productivity (TFP), which consequently contributes to increasing national income and economic growth. Kim (2003) also presented research findings that an economy grew faster when the market was open and patent rights were enhanced. Oh, et al. (2003) reported that reinforced patent systems could improve patent productivity. In Korea, it was reported that a 1% increase in patents granted was equal to a 0.11% rise in the national income (Yeon, 2003). These empirical studies, which explored the correlation between economic growth and patent enforcement, support the idea that the patent system is an effective tool for expediting technology innovation. This means that better protection of patent rights plays a vital role in a nation's economic competitiveness and growth.

Not all scholars agree on the positive effect of the patent system on industrial development. Recent empirical researches started to express skepticism about the traditional hypothesis that the patent system plays a vital role in stimulating innovation activities and economic growth. Jaffe (2000) pointed out that in the case of the United States, R&D investment for innovations was already expanding before patent protection was enhanced, indicating that there was no evidence that strengthened IPRs facilitated R&D efforts and technology innovation. Sakakibara&Branstetter (2001), which analyzed Japan's enterprises, found no evidence that the country's 1988 patent reform stimulated R&D and patenting activities. Jeong (2004) raised an issue with the findings of Yeon (2003) that his results identified only a correlation between increased patent applications and expanded national income, but no causality between them.

Given the varying views on the matter, it is difficult to come to a conclusive, general examination on the impact of the patent system on industrial development. As Mascus (2000) clearly noted, IPRs, including patent, could either enhance or limit economic growth

in theory. In reality, the process in which IPRs affect economic development and growth is complex and based on multiple variables (Marcus 2000, 1). With regard to the patent system, in particular, its influence over technology generally depends upon the technology development stage of the country in question (e.g. KIPO&WIPO, 2003; Kim et al., 2011). This is because the patent system could play either a positive or a negative role for technology innovation in those countries having diverse levels of technology and economic development. Kim (2003) elaborated this explanation by exploring the relation between the IPR systems and technological innovation activities in Africa and Asia. He discovered a disparity between the effectiveness of a patent policy according to a country's unique situations and technological development levels. The World Bank (2005) also expressed the possibility that IPRs could have differential effects on countries at different stages of economic development.

In other words, the impact of the patent system on industrial development in a given country depends on certain special circumstances in that country. This finding would also be in line with contradictory positions on whether IPRs promote or hinder industrial development: depending on the circumstances in countries, IPRs could be observed to promote or hinder industrial development. Therefore, it is necessary to observe the impact of the IPR system on industrial development, under given circumstances, i.e., the case of Korea. The next section is devoted to discussing the IPR system in Korea in the context of its development, with particular focus on the patent system.

2. Observation of Korea's IPR System in the Context of Industrial Development

While not many works have examined Korea's IPR system in the context of industrial development, Lee (2002) studied Korea's experience of industrial development in terms of its IPRs. Recognizing the relationship between the development level of Korea's technology/industry and the strength of IPRs, he found that levels of attention paid by the government or firms to the IPR system grew hand in hand with industrial development. Lee (2002) suggests that Korea was less interested in the IPR system or policy during its early industrialization stage when Korea's technological capacity was low. As its technological competence grew to the extent that it could import and improve technologies and produce globally competitive products with those technologies, however, the government and domestic firms recognized the importance of IPR in Korea's positive economic development and began to strengthen its IP protection. According to Lee, therefore, the role played by Korea's IPR system has changed in line with its technological development, and is generally judged to have played an important role in the development of industrial technology and economy (Lee 2002; Lee and Kim 2010).

Following the approach taken by Lee, this chapter will examine the role of the IPR system in the context of Korea's industrial development. In addition to the research done

by Lee, this paper attempts to provide more observations related to industrial development in Korea to help better understand its levels of industrial development (Table 1-2). Table 1-2 below summarizes stages of industrial development in Korea, from the 1960s, when Korea was a technology-poor country, to the present, when Korea is one of the world's major economies. The remaining part of this section will present the relationship between the industrial development and the IPR system in Korea, for each of the stages of industrial development.

Table 1-2 | Industrial Development in Korea, Divided into Four Periods

Time	(1) '60s to mid '70s (formation)	(2) mid '70s to mid '80s (high growth)	(3) mid '80s to late '90s (transition)	(4) post-financial crisis ('98)-present (rebound)
Growth Industry	Labor-intensive (e.g. Textile, footwear)	Heavy and Chemical, Electronics (e.g. Automobile, Television)	Electronics, Steel, Semiconductor	High-tech (e.g. IT, BT, NT)
Development Process	Goal: to build a production base; Characteristics: rely mainly on imported technologies	Goal: to promote self- reliance of technology; Characteristics: import substitution, localization of parts/ components and production	Goal: to export and expand the market; Characteristics: plant export begun, cutting- edge&core technology learned	Goal: world- class technology developed&related products exported; Characteristics: focus on world-class, creative knowledge generation
Technology Import	Packaged technology: turn-key-base plants, assembly technology	Unpackaged technology: parts/ components, Operation technology	Material-related technology, core/ design technologies, high-level product technology	Core&new technology created on its own
Production & R&D	Knock down, (Almost no in-house, R&D)	OEM/own brand: OEM-dominated, (Encouragement of R&D)	OEM/own brand: many products developed with own brands, product/process innovation (Strengthening of R&D)	Independently developed technology: pursuit of global new technologies (Leading R&D efforts)

Source: Constructed based on KIPO&WIPO (2003) and Lee&Kim (2010)

2.1 1960s to Mid 1970s

The 1960s to the mid 1970s is the period when Korea was in the early stage of industrialization. During this period Korea implemented its five-year economic development plan, which lasted from 1962 to the mid-1970s. As this period is characterized by a very poor technology base, the major industries for economic growth were labor-intensive industries, such as the textile, footwear and plywood industries (see Table 1-2). Exports were made by assembling imported parts at foreign imported facilities or by processing imported raw materials via an original equipment manufacturing (OEM) method. Technology transfer from advanced countries consisted mainly of assembling technology and packaged technology: turnkey-based plants (see Table 1-2).

Even though the inflow of technology was very low,³ the Korean government put great efforts to align technology rules and regulations to attract more foreign investment and technology (Park, 2000). There were laws on capital goods imports, foreign loans and technology imports, and technology, including the Foreign Capital Inducement Act (1966). In 1967, Korea initiated the Science and Technology Promotion Act for technological development (Ibid.). In 1968, to more effectively manage technology adoption, the country established a guideline that gave priority to those technologies that promoted exports, developed intermediate capital goods industries, or had an awareness-promoting effect. The Technology Development Promotion Act was enacted in 1972 to bring in more technologies (Ibid.). These efforts were put into place because the Korean economy was unable to develop industrial technologies on its own during this period.

Observing this period in terms of IPRs, the IPR system was not actively used for technology protection during this period (Lee, 2002; KIPO&WIPO, 2003; Lee&Kim, 2010). The inflow of foreign technology was low as foreign firms found little market for technology in Korea, and they showed little interest in seeking patents in Korea. With most domestic firms lacking technological capacity, the numbers of patent applications by domestic firms were also small. Meanwhile, the utility model system was actively being used by Koreans. Overall, the use of the IPR system during this period is dominated by utility models by local Korean residents (see Table 2-2).

2.2 Mid 1970s to Mid 1980s

The 1960s to the mid 1970s is the period characterized by the active importation of foreign technologies. During this period the economy shifted toward heavy and chemical industries (i.e. skill-intensive industries), which required more advanced technology to modernize. In order to stimulate the inflow of foreign advanced technology, Korea had to substantially ease up its technology import criteria. Thus, the government established the Technology Promotion Act in 1978 and 1979 to assist domestic firms in importing necessary technologies in a timely fashion (Park, 2000). To accelerate the influx of technology

³ As seen by Table 1-3, the amount of technology transfer was very low from the 1960s to the mid-1970s.

imports, the Korean reporting system was changed from the earlier pre-approval system to an automatic approval for technology imports in 1984 (OECD 1996).⁴ As seen in <Table 1-3>, the amount of technology imports had markedly increased during the period 1977-1986 with the help of these governmental initiatives.

Table 1-3 | Technology Transfer (1962-1993)

Time	Technology Transfer (TT)		Foreign Direct Investment (FDI)		Ratios (TT/FDI)		Machinery Imports (MI)	
	Payment [A] (USD \$M)	Cases [B] (Case)	Payment [A] (USD \$M)	Cases [B] (Case)	[A]/[C]	[B]/[D]	Amount [E]	[E]/Total Imports
1962-66	0.8	33	47.4	39	1.7	0.85	255	9.94
1967-71	20.4	285	218.6	350	9.3	0.81	1,387	16.02
1972-76	96.5	285	879.4	851	11	0.51	3,543	11.94
1977-81	451.4	434	720.5	244	62.7	5.02	12,335	13.05
1982-86	1,184.9	1,225	1,767.5	565	67	3.68	16,988	11.81
1987-91	4,359.4	2,078	5,634.7	1,622	77.4	2.14	52,503	17.18
1992-93	1,797	3,471	1,938.8	506	92.7	2.46	94,718	17.12
Total	7,906.1	1,240	11,207.6	4,177	70.5	2.1	181,729	15.97

Source: Lee&Kim (2010, 137), Korea Industrial Technology Association (KITA) and Bank of Korea, as cited in OECD, 1996, 83. UN Commodity Trade Statistics Database (SITC), <http://comtrade.un.org>

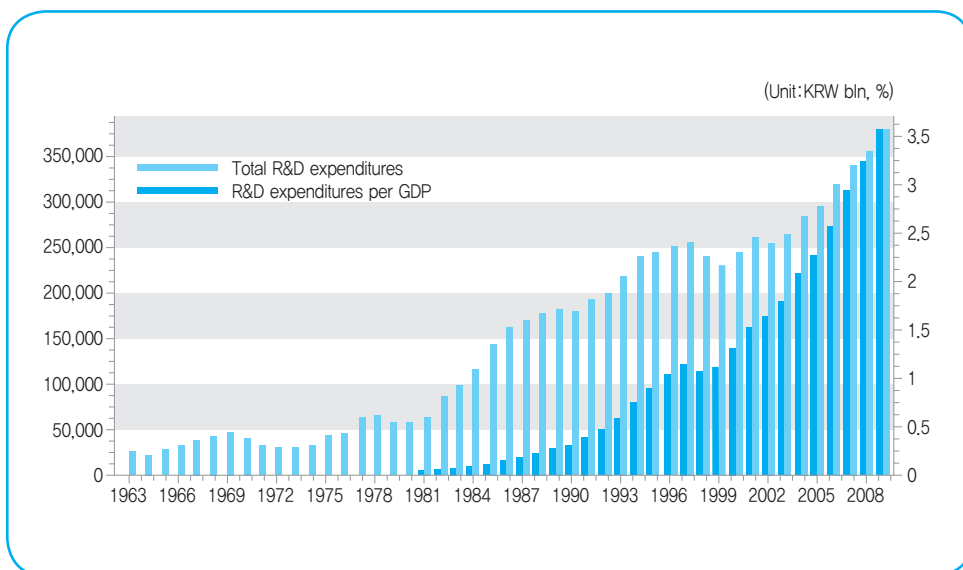
During this period domestic firms heavily invested in learning foreign technologies to secure markets in technology-intense industries and actively sought importation and transfer of foreign technologies. This made the Korean market a popular foreign technology importation (technology licensing) destination (Lee 2002), and highly active patent applications by foreigners followed. During the 1970s the number of Korean patents issued clearly showed that foreign patents increased dramatically (see Figure 1-2). This behavioral pattern of the firms in using the IPR system is in line with their technological capabilities. Foreign firms, as technology exporters, were actively seeking patent protection, while domestic firms with low technological capabilities had yet to use the patent system intensively.

⁴ Before 1984, technology imports had to be approved by a reporting system (OECD, 1996).

2.3 Mid 1980s to Late 1990s

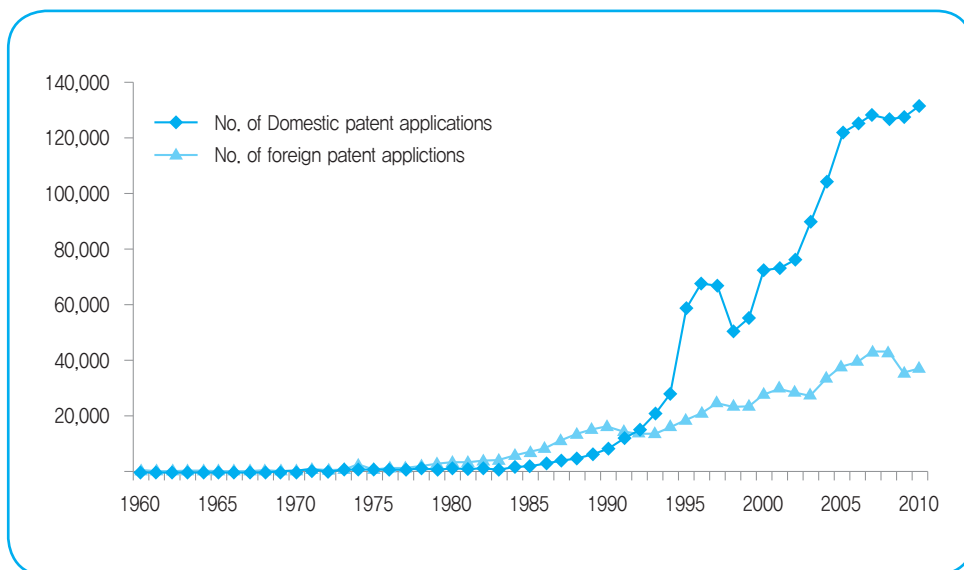
The mid 1980s to the late 1990s is the period of rapid growth in technological capability through intensive R&D efforts. From the early 1980s, the Korean economy was forced to produce globally competitive products to secure internal/external markets (Lee, 2002; Lee and Kim, 2010). Responding to these needs, Korean firms started to extensively invest in R&D to learn from foreign technologies and develop their technology capacity. As seen by [Figure 1-1], R&D expenditures per GDP had strikingly increased during the period 1980-90s. With extensive R&D efforts, Korean firms started to expand the market in knowledge-intensive industries by assembling imported knowledge-intensive core components and domestically produced less knowledge-intensive components (Ibid.). Some knowledge-intensive core product parts were produced domestically during this period. As technological capacity grew to a very high level, exports of Korea's own brands exceeded Korea's OEM-based exports (OECD, 1996; See Table 1-3).

Figure 1-1 | Total R&D cost in Korea



Source: Ministry of Education, Science, and Technology, Report on the Survey of R&D in Science and Technology

Figure 1-2 | Number of patent applications by domestic and foreign applicants filed in Korea (1960-2010)



Source: Database of KIPO statistics

With this growth of indigenous technological capabilities, the share of domestic applicants was rising rapidly during this period. As seen in [Figure 1-2], the number of patent applications rose rapidly in the mid 1980s. In 1992, domestic patent applications exceeded that of foreigners' patent applications, and the gap has grown since 1992 (See Figure 1-2). Again, the behavioral pattern of the firms in using the IPR system is in line with their technological capabilities. A domestic firm's increasing technological capabilities suggests substantial growth in their patenting activities.

2.4 Post-Financial Crisis ('98) to the Present

The last period is from the late 1990s to the present. In the late 1990s, especially after the 1997 financial crisis, the Korean economy had to undergo drastic reforms in the financial sector, corporate organization, government regulations, and labor relations (KIPO&WIPO, 2003). Although the firm's R&D activities were adversely affected after the 1997 crisis in terms of the dropped levels of patent applications, Korea's economy rebounded as a result of successful restructuring. The levels of patent applications continue to rise since the late 1990s [Figure 1-2]. It shows a rapid increase in the number of patent applications as well as an increasing gap in patenting activities between domestic and foreign applicants.

3. Proposing Three Developmental Phases of Korea's IPR System

In the previous Sections, it is found that the existing discussions on the IPR system and industrial development essentially share the same characteristics: a pursuit of a generalized description of the role of the IPR system in industrial development. As seen in Section, the two views contradict one another on whether a stronger IPR system promotes or deters a country's development. The studies in Section discussed in the context of Korea found that the role of Korea's IPR system in its economic growth differed depending on the levels of technological capabilities.

Although those studies provide excellent points that are useful in understanding the interplay between the IPR system and industrial development, they are of limited use for policy makers in developing countries because they draw general conclusions on the IPR system. They fail to explain how an IPR system in a given country can evolve by active involvement of policy makers and firms. In other words, for those seeking policy advice in a developing country, they need to know “what policy makers need to do” or “what firms need to do” in the actual operation of the IPR system. To that end, they need to have a more detailed picture of which policy decisions were made according to certain aspects of Korea's IPR system, what affected the Korean policy makers to choose certain policy options, or how firms behaved as a response to changed IPRs systems. Recognizing the limitations of the previous studies, this paper focuses on the course in which Korea's IPR system has developed because of the active involvement of policy makers in adopting and changing laws and policies.

In <Table 1-4> below, major events that have shaped Korea's IPR system are presented; the events that eventually led to changes in the IPR legal regime or policies (for more detailed description of the changes in the IPR legal regime, see <Table 1-5>). It is noted that three distinctive periods are discerned in the course of the development of the IPR system, suggesting active involvement of policy makers in the development of the IPR system. For example, during the period from the 1980s to the late 1990s the Korean government's active participation in multilateral agreements and establishing an educational institution (Patent Training Academy) makes it appropriate to name the period “establishment”.

To explain the three developmental phases of Korea's IPR system in detail, the “introduction” period (first phase). During this period the patent system was modernized and stabilized in the country, which stimulated domestic technology development activities. The “establishment” period (second phase) was the time period when accumulated domestic technological progress increased the demand for foreign technologies and Korean firms' overseas activities. Thus, the country's IPR system and the infrastructure for IPR creation/application/protection were improved so that the system could be integrated into the global IP system. Finally, in the “advancement” period (third phase), Korean enterprises achieved world-class innovative technology capacity; hence, strategic IPR policies were pursued to enable better use of the IPR system.

Table 1-4 | Three Developmental Phases of Korea's IPR System

Periods	Characteristics	Major Events
1 Introduction (1960-70s)	modernize & settle the system	<p>1961: framed a patent system</p> <p>1973: recognized foreign publication as prior art introduced employee's invention compensation</p> <p>1974: Korea-Japan Industrial Property Right (IPR) Protection Agreement (the first agreement with a foreign country)</p> <p>1977: established Korea Intellectual Property Office (KIPO)</p>
2 Establishment (1980-late 90s)	join global IPR regime & strengthen domestic infrastructure	<p>1979: joined the WIPO</p> <p>1980: joined the Paris Accord started the 1st Modernization Plan of KIPO ('80-'86)</p> <p>1984: joined Patent Cooperation Treaty (PCT)</p> <p>1987: introduced product patent system, extend patent period under Korea-United States IPR MOU established Patent Training Academy enacted Patent Management Special Accounting Act started the 1st Modernization Plan of KIPO ('87-'90)</p> <p>1995: amended the Patent Act; reflected TRIPS provisions</p>
3 Advancement (late 1990s-present)	pursue strategic IPR policies	<p>1999: opened KIPOnet (electronic patent application system)</p> <p>1999: conducted PCT international investigation & preliminary review</p> <p>2005: mandated national R&D patent investigation</p> <p>2006: the world's shortest review period (9.8 months)</p> <p>2007: acknowledged the minimum range of provisions in the Patent Cooperation Treaty</p> <p>2008: adopted three-track review system</p> <p>2010: passed basic IPR law</p>

Not only are the three developmental phases of Korea's IPR system useful for understanding people's active involvement in the development of the IPR system in Korea, the dynamic pattern (introduction→establishment→advancement) will also provide developing countries with direction on how to operate their IPR system from its inception. While not all the laws and policies of Korea are applicable to other countries, they may follow the same course in which Korea adopted its IPR system ("introduction"), participated in the global regime, improved its IPR system to global standards ("establishment"), and then finally implemented a customized system ("advancement"), while optimizing detailed laws and policies to suit conditions in their countries.

The following Chapters 2, 3, and 4 will elaborate more on each developmental stage in the development of Korea's IPR system, by discussing major changes in the IPR system. To highlight the people's active role in the development of the IPR system, we will present the surrounding circumstances of the changes, and how policy makers in the Korean government responded to the circumstances to adapt to those changes.

Table 1-5 | History of IPR Legal System in Korea

Date	Description of Amendments
1908	The Patent Decree laid the foundation in Korea for institutionalizing intellectual property (the earliest Korean law protecting intellectual property was enacted).
1910	As Japan annexed Korea under Japanese colonization, the Royal Decrees were repealed, and Japanese IP laws were instituted with little alteration.
1946	The Patent Bureau was established within the Ministry of Trade and Industry and the Patent Act, covering inventions, utility models, and designs, was passed.
1961	<p>As a result of a legal reorganization project after the military revolution on May 16, 1960, the military administration revised the overall legal system to update its old, intractable predecessor. As a part of national modernization, the Patent Act (No. 950), Utility Model Act (No. 952), and Design Act (No. 951) were newly established and promulgated in 1961.</p> <ul style="list-style-type: none"> • Patentable subject matter was defined as industrially applicable, novel and inventive. • Patent Act adopted the first-to-file (or first-to-apply) rule. • A non-resident had to appoint a representative who had an address or place of business in the ROK to initiate any procedure in relation to a patent. • Patent Act allowed a non-exclusive license by virtue of prior use. • Patent Act provided for the mandatory grant of a non-exclusive license where a patented invention has not been continuously worked commercially or industrially in Korea. • The term of protection was set at 12 years.

Date	Amendment (implementation)
1963	<p>The government amended the 1961 Patent Law in order to remedy a number of defects and prepare for upcoming international demands, and the amended law was promulgated on March 5, 1963.</p> <ul style="list-style-type: none"> • Patent Act allowed conversion of application. • Patent Act introduced provisions on priority claims.
1970	<p>With the successful implementation of three consecutive five-year Economic Development Plans, rapid economic growth took place in the ROK in the early 1970s. As the scale of the economy grew and industrial technologies rapidly improved, an advanced IPR system was required to encourage the technological development of domestic industries in preparation for the era of international free competition. To meet the demands of the era, an overall amendment to the IP laws was carried out in 1973.</p> <ul style="list-style-type: none"> • The invention of a substance produced by nuclear transformation was excluded from the scope of patentable subject matter. • As international transport and communication technologies were highly developed, the so-called international standard for novelty adjudication was adopted, which rules that inventions described in a publication distributed not only in the ROK, but also in a foreign country.
1980	<p>As the development of international transport and communication technologies increased, the growth of the patent system accelerated rapidly around the world. Keeping in line with patent policy changes in the international arena, the ROK became a member of the World Intellectual Property Organization in 1979 and acceded to the Paris Convention in 1980 and to the Patent Cooperation Treaty (PCT) in 1984. After having thus joined the international IPR community, it amended its IP laws as many as 19 times in the 1980s to keep up with international demands.</p> <ul style="list-style-type: none"> • It adopted an earlier publication system for applications. • It adopted a request for examination system whereby an application would be examined only on the filing of a request. • It added an article for backing up the priority claims based on the Paris Convention. • It adopted a preferential examination system. • It added an article specifying the international application procedures under the PCT. • It enlarged the scope of patentable subject matter to include pharmaceutical inventions, methods of producing pharmaceuticals, substances and substance-uses. • It extended the term of patent protection from 12 to 15 years from the grant of the patent or 18 years from the application date.
1990	<ul style="list-style-type: none"> • The entire Patent Act was amended to rearrange the article structure in a more systematic and reasonable way. • Its scope was enlarged to accommodate plant patents. • It adopted a so-called domestic priority claim system, by which an applicant could claim priority based on an earlier patent application, as provided in international treaties.

Date	Amendment (implementation)
1993	By eliminating bureaucratic regulations, an overall amendment was made to the Patent Enforcement Decree and Patent Enforcement Regulation to establish a more reasonable and applicant-friendly patent system.
1995	<p>The IP Tribunal was established for the conduct of patent-related administrative proceedings independently using technical expertise. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) had a marked influence on the IP law system.</p> <ul style="list-style-type: none"> · The main features of the amendment comply with the TRIPS regulations by enlarging the scope of patentable subject matter, extending the term of patents to 20 years. · Since the TRIPS Agreement required all contracting States to amend their IP laws in accordance with the TRIPS regulations, the Korean government amended its IP laws accordingly.
1998	<p>As Internet technology has developed at an incredible speed, the world has been globalizing faster than ever, and it has become easier to disseminate technology or information. To correspond to the age of information and globalization, IP laws have been amended.</p> <ul style="list-style-type: none"> · When KIPO introduced an online application system called KIPOnet, articles dealing with online applications were added to the Patent Act. · To encourage the development of new technology and prompt acquisition of IPRs, the Quick Registration System (QRS) was introduced for utility models; as a result of its introduction, the dual application system was adopted and the converted application system was abolished. · When ROK was selected to become an International Searching Authority (ISA) and an International Preliminary Examination Authority (IPEA), articles relating to those roles were added.
2001	Some detailed procedures of examination, such as the system of giving final notice of the reasons for refusal, were introduced to improve the quality and efficiency of patent examinations.
2006	A system of dual application for a patent was abrogated and a system of altered application for a patent revised. The opposition to the grant of registration into an invalidity trial system was integrated and the public announcement from a local system was converted into an international system.
2007	The requirements to enter detailed explanation for an invention and claim of patent submission extension system were mitigated. Application examination system and claim of patent filling method were diversified.

Source: Author's elaboration based on WIPO website from <http://www.wipo.int/wipolex/en/details.jsp?id=8852>

2011 Modularization of Korea's Development Experience
Korea's Intellectual Property Rights System and its
Application to the Phases of Industrial Development
: Focusing on the Patent System

Chapter 2

The First Developmental Phase of Korea's IPR System: Introduction Period (1900s~70s)

1. Overview of the Introduction Period
2. Outline of Patent System&Policy
3. Major Details of Patent Administration and Infrastructure

The First Developmental Phase of Korea's IPR System: Introduction Period (1900s~70s)

1. Overview of the Introduction Period

The introduction period stands for a period during which a basic form of the IPR system was set up by the introduction of legal regimes for protecting IPRs.

The establishment of Korea's IPR system was not actively established by the Korean government, but rather by some world powers so that they could protect their foreign patent rights and hold on to a dominant position in the market (Han&Jang, 2007). At first, the Korean IP law was enacted by “the Agreement between the U.S. and Japan for protecting inventions, designs, patents and copyrights”, which consequently led to the promulgation of a Patent Decree, a Design Decree, a Trademark Decree, and a Copyright Decree in 1908 (Ibid.). In 1910, however, those decrees were repealed, and Japanese IP laws were instituted with little alteration because Japan annexed Korea under the Japanese colonization process (KIPO, 2007). Those IP laws remained in effect until 1945, the end of Japanese colonization.

After Korea's liberalization from the Japan's 1910-45 colonial rule, Korea was governed by the US military government until 1948 when an independent Korean government was established. During this period a legal system for IPR was required. Thus, the Patent Bureau was established within the Ministry of Trade and Industry, and the Patent Act covering inventions, utility models, and designs was enforced in 1946. The 1946 Law was practically the first modern IP law in Korea (Lee&Kim, 2010). However, the 1946 Patent Law was rather rushed and patterned after the U.S. law so as to quickly repeal Japan's Patent Act (Jeong, 2004). In addition, it did not contribute much to technical industrial development because the Korean War soon broke out in 1950 and the economy collapsed (Lee&Kim, 2010).

Table 2-1 | Trends of Major IPR Variables in Korea

	1965	1970	1975	1981
R&D/GDP	0.34	0.37	0.42	0.62
Foreign Patents	160	639	1,588	3,984
Domestic Patents	858	1,207	1,326	1,319
Domestic Share (%)	84.3	65.4	45.4	24.9
Utility Model [A]	2,849	6,167	7,290	9,064
Invention Patents [B]	1,018	1,846	2,914	5,303
Ratio [A]/[B]	2.80	3.34	2.50	1.71
Individual (Korean) Patents	-	-	-	10,781
Corporate (Korean) Patents	-	-	-	241
Corporate share (%)	-	-	-	18.27

Source: Lee&Kim (2010, 137)

During the 1960s the effective IPR system began to be established upon the implementation of the overall revision of IP laws for postwar reconstruction (Ibid.). In 1961, the Korean government began to revise its whole system of laws, and promulgated the 1961 version of Patent Law to facilitate the catch-up process of the Korean economy. It became the foundation of Korea's present IP registration (Jeong, 2004; Lee&Kim, 2010). Overall, the period of 1960s-70s, the introductory phase, is characterized by the establishment of the effective industrial property system resulting from the overall revision of industrial property laws in 1961 and 1963 (Lee&Kim, 2010). During this period, with the modern IPR system, Korea began its modernization with the five-year economic development plan, while promoting an invention-friendly climate and enlightening the significance of IPRs for technological development. During this period, the number of IPRs (patents and utility models) had been increased (see Table 2-1). Notably, the utility model system, which awards IP rights to inventors of small inventions that do not qualify for patent rights, was extensively used at the introductory period.

In this period, the overall degree of Korea's IPR protection was weak compared to the 1946 patent act (Jeong, 2004). For instance, the term of protection was shortened from seventeen to twelve years. In addition, Korea limited foreign patent rights to protect the domestic industry and develop its technology base. For example, a nonresident was required to assign his representative, who has an address or a place of business in Korea, to initiate any procedure related to a patent. In this situation, Korea's IPR-generating activities were mainly generated by the domestic inventors; the share of domestic patents was much higher than that of foreign patents during the period of the 1960s (see Table 2-1).

However, the number of foreign patents surpassed that of domestic patents in 1975 and 1981 (see Table 2-1). It is related to the Korean government's efforts for indigenous technological development through the inflow of foreign advanced technologies. As the heavy and chemical industry promotion required advanced foreign technologies in the early 1970s, an overall amendment to the IP laws was carried out in 1973 so as to attract more foreign technologies.(See Table 1-5).

Another interesting feature is that the ratio of utility models to invention patents had been decreasing from 1970 to 1981. It implied that Korea's weak IPR protection helped develop indigenous technological capability by means of imitating foreign advanced technology (see Table 2-1). During this period, the weak protection regime encouraged minor adaptations and incremental innovations on the foreign inventions by domestic enterprises and developed a patent culture through utility models and design patents (Lee, 2002; Lee&Kim, 2010).

In summary, the introduction period can be explained by three distinctive facts. First, the number of IPRs, especially the utility models, had been dramatically increased. Thus, the Section 2.2 explores the role of the utility model. Then the employee invention compensation system was introduced to explain the increasing number of corporate patents (see Table 2-1). Third, foreign patents began to exceed domestic patents since the mid 1970s. Against this background, this paper will touch on how Korea corresponded to the changes in Korea's IPR environment during this period. Therefore, this paper will touch upon the Korea Intellectual Property Office (KIPO) which was launched to more effectively deal with IPR-generating activities of domestic and foreign inventors.

2. Outline of Patent System&Policy

2.1 Efforts to Stabilize the Patent System: Utility Model Introduction

In 1961 the Korean government revised its entire system of intellectual property laws and established its first autonomous IPR system. When Korea introduced the patent system in 1961 the technological capability of Korea was quite low compared to other countries. At this time, the introduction of the patent system in Korea was thought to impede the people's desire to develop indigenous technologies because patents required a high level of inventiveness. Against this background, the utility model system⁵ was also introduced in 1961 to support the indigenous inventive activities and encourage IPR-generating activities (Yun, 2010: 187).

Korea's utility model law mirrored Japan's law,⁶ which awards IP rights to inventors of small inventions that do not qualify for patent rights. As the utility models granted a right

⁵ Korea's Utility Model Law (Law No. 952) was promulgated as an independent law on December 31, 1961.

⁶ The utility model system was first implemented by Germany. Japan adopted the German laws, but the Japanese utility model system was different from the German one. It had a broadened scope of application and applied to less sophisticated devices that serve a practical purpose (Institute of Intellectual Property, 2000).

to small inventions which the patent act may have overlooked, the utility model system effectively helped maximize the patent system's functions (Institute of Intellectual Property, 2000). Such supportive roles of the utility model system in the patent system helped people eventually become more familiar with the patent system. Taking this into consideration, Korea's Utility Model Law (Law No. 952) was promulgated as an independent law in 1961 to raise people's awareness of the IPR system (i.e. patent and utility model system) and facilitate indigenous inventive activities for technology development.

In the initial stage of introduction of the IPR system, the Korean utility model system was significant in promoting Koreans' inventive activities and IPR-generating activities (see Appendix 1). As indicated in <Table 2-2>, Korea's utility models have been extensively utilized. Especially, the ratio of utility models to patents had increased until the mid 1980s. The main reason why the utility models were dominantly utilized in the early stage of economic development is that the utility models are generally less expensive to apply for and do not require substantive examination (Park&Kim, 2002: 625).

While the utility model requires a low level of inventiveness, gaining a patent right requires a great deal of time and involves a large amount of R&D expenditures. So it can be a burden to individuals and small-and medium-sized firms, which does not have enough resources. Through the utility model system, Korea was able to encourage smaller domestic firms as well as local residents to produce small technological innovations and quickly introduce new products and technologies into the market place (see Appendix 1).

Due to the low technological capabilities of Korea in its early developmental stage, the number of utility model applications exceeded that of the patents in the first phase of Korea's IPR development process (see Table 2-2). During the 1960s and 1970s firms did not possess the resources to conduct highly innovative R&D and thus firms relied heavily on imported technologies and on reverse engineering, adapting them for local needs (Kim, 1997; Lee, 2002). In 1975, more than five times the number of Koreans applied for utility models than those who applied for patents. This indicated that the system protecting the utility model contributed to protecting and spreading Koreans' small inventions during that period. The system also played a large role in boosting domestic technological development by protecting Koreans' small inventions in the early days when the patent system was introduced and there was a considerable gap between technology levels of advanced countries and Korea (Jeong, 2004). In sum, the relationship between the utility model and patents filed during the IPR introductory period (1960s-'70s) tells us that the utility model played a key role in elevating IPR awareness and settlement in the country (Park, 2000).

Table 2-2 | Total Issuance of Utility Model&Patent in Korea (Locals + Foreigners)

Category		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Koreans	Patents [A]	545	800	714	670	744	858	883	855	1086	1154	1207	1283	1377	1622	1093	1326
	Utility Models [B]	1207	1683	1791	1788	2244	2818	3237	3585	5114	5562	6143	6789	7736	7536	5817	7052
	Ratio[B]/[A]	2.21	2.10	2.51	2.67	3.02	3.28	3.67	4.19	4.71	4.82	5.09	5.29	5.62	4.65	5.32	5.32
Foreigners	Patents [A]	66	58	68	101	164	160	177	322	377	547	639	623	618	776	3362	1588
	Utility Models [B]	0	0	2	2	0	31	15	9	15	11	24	21	11	25	1016	238
	Ratio[B]/[A]	0.00	0.00	0.03	0.02	0.00	0.19	0.08	0.03	0.04	0.02	0.04	0.03	0.02	0.03	0.30	0.15
Category		1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Koreans	Patents [A]	1436	1177	994	1034	1241	1319	1556	1599	2014	2703	3641	4871	5696	7021	9082	13253
	Utility Models [B]	8117	7199	6212	7215	7936	8519	9500	10345	13814	17615	21434	23684	21666	20655	21661	25125
	Ratio[B]/[A]	5.65	6.12	6.25	6.98	6.39	6.46	6.11	6.47	6.86	6.52	5.89	4.86	3.80	2.94	2.39	1.90
Foreigners	Patents [A]	1825	1962	3021	3688	3829	3984	4368	4795	6619	7884	9118	12191	14355	16294	16738	14879
	Utility Models [B]	261	402	433	742	622	545	1169	1140	951	933	967	1089	1011	875	993	770
	Ratio[B]/[A]	0.14	0.20	0.14	0.20	0.16	0.14	0.27	0.24	0.14	0.12	0.11	0.09	0.07	0.05	0.06	0.05

Source: Statistical data from Korean Intellectual Property Office

Korea's utility model system has gone through many changes: Korea's utility law has been revised 24 times thus far (Jeong, 2004). Initially, utility models were subject to substantive examination and conversion between the patent and utility model was allowed. However, in 1999 to facilitate the application process for utility models KIPO adopted its "Quick Registration System (QRS)." Under this system, applications for utility models were not examined on substantive matters such as novelty, inventive step and industrial applicability, but only on basic requirements such as description requirements. Substantive examinations were made only if there was an infringement against utility model rights. This system was adopted because expeditious protection was required for utility models, owing to the shorter life cycles of products that incorporated them. Under this system, the dual application (if a patent application was filed on or after July 1, 1999, an applicant of a patent application may file a dual utility model application in parallel with the patent application) rather than a conversion of the application was adopted. Although there certainly were some advantages in introducing the QRS for utility models, such as the prompt acquisition of IPRs, the QRS contains an intrinsic handicap, namely the possibility of unreliable IPRs being granted. Thus, the QRS was abandoned in 2006 due to the surge in unqualified utility

models. Consequently, the substantive examination was reintroduced and the conversional application was reintroduced.

In sum, the utility model system is judged to a good IPR system by supplementing the patent system and encouraging the indigenous inventive activities of Korea, especially in the 1960s and 1970s (See Appendix 2). Granting rights through patents requires a great deal of time and involves expending a large amount of revenue, so it can be a burden to individuals and small- and medium-sized firms. However, through the utility model system, Korea was able to encourage smaller domestic firms to produce small technological innovations and quickly introduce new products and technologies into the market place. As demonstrated by the Japanese utility model example, the utility model system can be assessed as a superior means of aiding domestic inventors to improve imported machinery and/or equipment, or not only invent a new technology but also add a new function to an original technology (Kim, 2010).

On the other hand, some people doubted whether the utility model system actually played a big role in promoting technological innovation and enhancing Korea's competitiveness in the international community since it was perceived that not a high level of skill was required to produce small inventions (See Appendix 1). In addition, the number of cases applying for utility models, which had been consistently decreasing to the point it was difficult to run the system, made people skeptical about the significance of the program (Kim 2010).

The Korean technology level, however, cannot be compared to technologically advanced countries. Still the utility model system is necessary for protecting areas where the Korean technology level has not fully been developed. Additionally, smaller inventions also require appropriate protection since the accumulation of smaller technological innovations can often times result in major technological discoveries. If the seemingly less significant technologies are neglected, inventors may lose their incentive to produce technology and products, or tend to keep results of research and development a secret. It is therefore essential to introduce technologies by protecting the smaller inventions, as well as the ostensibly "larger, more important" technologies.

Currently, small-and medium-sized firms, as well as individual inventors, still prefer the utility model system in Korea, and thus the system is considered valuable. It should therefore remain to encourage and protect inventors' respective inventions. Also, small inventions are protected by the patent law in other countries, such as Germany and Japan, so if the protection of small inventions is discontinued competitiveness can be weakened on the international stage.

2.2 Efforts to Promote Invention: Introduction of the Employee Invention Compensation System

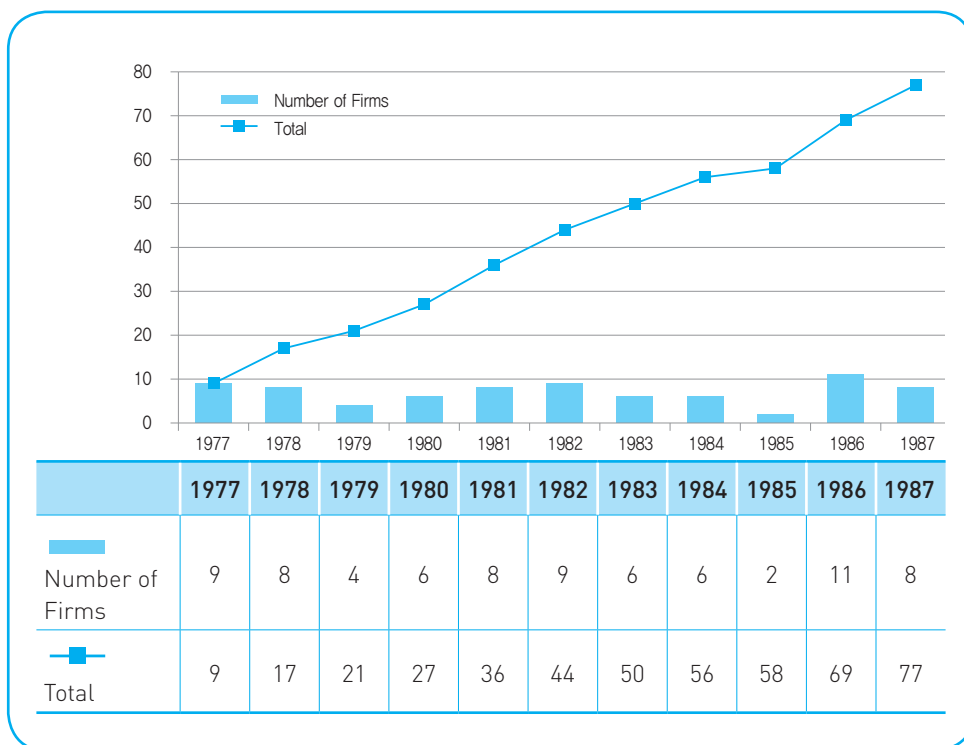
With the start of the five-year economic development plan in 1962, the Korean government made efforts to provide an environment where awareness of the importance of an invention, and IPR, can be shared in society to develop indigenous technological capability (see Appendix 3). In the early stage of industrialization, the employee invention compensation system was evaluated as a system that could play a greater role in promoting indigenous inventive activities (Ibid.). The employee invention compensation system helps reasonably distribute profits from an invention to employees who had invented a process or a device through their creative efforts, as well as users who invested in and provided funds and facilities for the invention's progression. Thus, the system was established to enhance individual inventors' desire to invent, as well as lead economic development by strengthening competitiveness through employers' (usually firms') active technological innovation (research&development).

To promote inventive activities in Korea, the employee invention compensation system started in January 1973 after "Regulations on Remuneration of Public Officials' In-Service Inventions" (Presidential Decree 6397) was legislated and promulgated. The regulation of the employee invention compensation system targeted public officials, with its main objective to succeed to patent rights, utility model rights, and design rights that public officials were granted while they were working. This was in conjunction with paid compensation for the rights and the money paid when the rights were transferred, based on compensation rules for employees defined by the Patent Law (Korean Intellectual Property Office, 2007).

In June 1973, by the prime minister's directive, the system expanded to local authorities, state firms, public research organizations, and private organizations, so the system was used across varied types of businesses (Korean Intellectual Property Office, 2011). As such, the system targeting public officials expanded to private firms, so each company's expectations of the system were enhanced. As a result, the number of firms running the system increased from 9 in 1977 to 77 in 1987 (See Table 2-1).

In 1987, the government improved awareness of the system by arranging seminars with the theme: "Implementation of the Employee Invention Compensation System." From managers to employees, the seminar pertaining to IPR played a significant role in enhancing the awareness of the patent system (Korean Intellectual Property Office 2007 82). Korea Intellectual Property Office (KIPO) also publishes the "Guidelines for the Employee Invention Compensation System" and distributed it to major firms to improve firms', and firms' employees', awareness of the system. KIPO encouraged firms to implement the system, and in keeping with this goal, since 1994 it has held an invention promotion competition among firms' employees to vitalize research and development among Korean firms, universities, and research institutes, as well as to raise the morale of the individual inventors (Korean Intellectual Property Office, 2007).

Figure 2-1 | Firms Implementing Employee Invention Compensation System



Source: Korean Intellectual Property Office (2007, 83)

Currently, small- and medium-sized firms, universities, and research institutes, along with large firms, create and effectively run the employee invention compensation system. The percentage of employees' inventions in Korea has consistently exceeded 80% for five consecutive years (see Table 2-3). Considering that inventions by firms, research institutes, and universities are mostly employees' inventions, strongly protecting, encouraging, and nurturing employees' inventions is a very essential component to improving national technological competitiveness.

Table 2-3 | Progress of Employee Invention in Korea (2002-2006)

(Unit: Number of Cases)

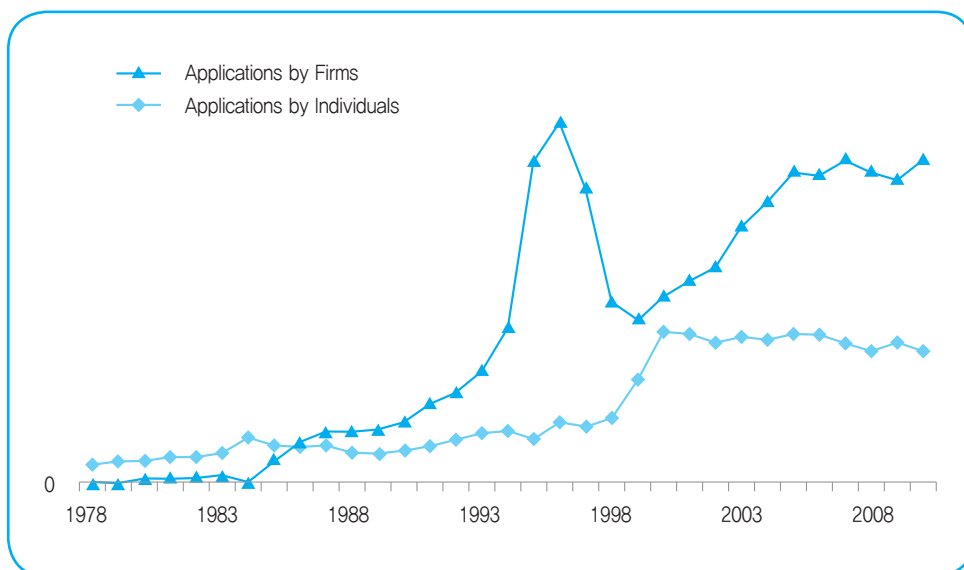
Category	2002	2003	2004	2005	2006
Individual Invention (A)	19,662	21,275	22,104	24,368	26,974
Employee Inventions (B)	86,474	97,377	118,011	136,553	135,644
Total (C)	106,136	118,652	140,115	160,921	162,618
Proportion of Employee Inventions (B/C)	81.5%	82.1%	84.2%	84.9%	83.4%

Source: Korean Intellectual Property Office (2011, 171)

As a result of a 2006 survey of 2,213 organizations out of 6,300 firms, public research institutes, and universities performing R&D activities, approximately 34.7% participated in the employee invention compensation system (Korea Institute of Intellectual Property 2006). Most organizations involved in the system replied that their competitiveness improved, thanks to an increase in their employees' inventions after the system was introduced. Additionally, the organizations' employees' desire to work was also enhanced (Korea Institute of Intellectual Property 2006). Pertaining to the question about difficulties caused by the implementation of the system, a significant number of people responded that there were no problems, which indirectly indicates that the activation of the system has had a positive impact on the participants (Korea Institute of Intellectual Property Ibid. 2006).

Although awareness of the significance of the employee invention compensation system has been consistently augmented, the understanding of its specific details is relatively low and there is a gap between employers and inventors relating to their knowledge of the program (Korea Institute of Intellectual Property 2006, 61). Also, approximately 65.3% of large firms, approximately 20.3% of small-and medium-sized firms, and roughly 27.8% of venture capital firms are implementing the system, which indicates a sizable differential among the three groups in the implementation of the program (Korea Institute of Intellectual Property, 2006: 61). In sum, the employee invention compensation system is not as utilized by the small- and medium-sized firms, nor by the venture capital (VC) firms, as by the larger firms. Additionally, it is difficult to force the smaller firms and VC firms to implement the program, since they recognize that the employers enjoy exclusive and transferable rights of exploitation of patents resulting from their respective employees' inventions (Korea Institute of Intellectual Property Ibid., 2006: 64).

Figure 2-2 | Progress of Patent Applications by Applicants (Firms, Individuals)



Source: Statistical data from Korean Intellectual Property Office (Statistical yearbook of IPR)

In many cases, unlike the private sector, officials in the public sector invent basic or initial-stage applied technology that cannot be instantly commercialized; therefore, it may take a considerable amount of time for the technologies to be adopted and remuneration to be paid after the invention is registered. Additionally, the leading research institute retains sole ownership of the results of government research and development projects. However, the decision of how the projects are managed is made at its sole discretion, which causes confusion among employers and inventors (Korea IPR Research Institute).

As mentioned above, much time and effort are needed to stabilize and vitalize the employee invention compensation system. It can, however, be concluded that the program is playing a significant role in enhancing individual inventors' desire for inventing and promoting firms' technology development activities. Moreover, as it becomes more difficult for individuals to independently invent, as industries become more highly advanced, and technologies for the industries become more complex and diverse, the number of inventions performed by organized firms, research institutes, and universities has steadily increased. In a broad sense, if firms' patents are considered the inventions made by its employees, the number has gradually increased (See Figure 2-2). Given the above scenario, the more important the employee invention compensation system is to employers and their employees, the more Korean firms, institutions, and industries will expand.

3. Major Details of Patent Administration and

Infrastructure

3.1 Efforts to Stabilize Patent System: Patent Attorneys Association

Patent attorneys, who represent clients in obtaining patents and acting in all matters and procedures relating to patent laws and practices, are required to possess specialized qualifications with technology and legal backgrounds. Without appropriately qualified attorneys, it is hard to expect a decent quality of intellectual property in a given country. The importance of the patent attorney system is that the system regulates the eligibility and procedure necessary for patent attorneys.

Table 2-4 | History of the Patent Attorney System

Date	Details
1908.08.12	The Patent Decree No. 196
1908.08.19	Application of Japanese Patent Agent Rule to Korea
1909.10.23	Promulgation of Korea Patent Attorney Decree (the law code 308)
1921.04.30	Promulgation of Patent Attorney Law under the Japanese Government-General of Korea (the Japanese law code 100)
1946.06.26	Inauguration of Chosun Patent Attorney Association
1947.05.01	Renamed 'Chosun Patent Attorneys Association' to 'Korea Patent Attorney Association'
1947.11.06	Holding the First Patent Bar
1961.12.31	Enactment of Patent Attorney's Law (the law code 864) Re-inauguration of 'Korea Patent Attorney Association'

Source: Author's construction based on Korea Patent Attorney Association (2007)

As seen in <Table 2-4>, the origin of Korea's patent attorney system dates back to the Japanese colonial era, when Korean Rule of Patent Agent Registration was promulgated in August 19, 1908, which simply adopted the Japanese Rule of Patent Agent Registration. The intended beneficiaries of the Korean Rule of Patent Agent Registration were Japanese not Korean—thirty-one patent attorneys registered in Korea were all Japanese. During the Japanese occupation period most patent attorneys were Japanese and most patent applications were filed by the Japanese rather than Koreans. Thus, the overall observation of the patent attorney system can be that the system was managed to protect the IP rights of the Japanese.

However, it should be noted that the patent attorney system during the Japanese colonial period (1910-1945) produced some Korean patent attorneys who played the important role in localizing and modernizing Korea's IPR system (KPAA, 2007). More specifically,

Korea's patent attorneys took the lead in the science movement to enlighten the general public. They actively participated in various activities to promote inventing activities among the public, such as the establishment of an invention association, and the provision of lecture series (Ibid.).

Table 2-5 | The number of people who pass the patent bar exam (1945~1980)

Year	'47	'63	'64	'65	'66	'67	'68	'69	'70	'71	'72	'73	'76	'78	'79	'80
Applicant	15	41	46	35	34	35	21	20	21	26	24	24	27	94	102	115
Successful Candidate	2	8	1	1	0	1	0	2	1	3	2	2	4	6	12	12

Source: KPAA, 2007, p.208

After Korea was liberated from Japan's 1910-45 colonial rule, the licensed patent attorneys in the Japanese colonial era obtained their qualifications according to the 1946 patent law. New patent attorneys were also produced through the patent bar exam under the 1946 patent law. Although there existed a small number of patent attorneys before the 1980s, as seen by <Table 2-5> above, the patent attorneys made a huge contribution in the enhancement of Korea's patent system by organized activities through Korea's Patent Attorneys Association, which was established in 1962 (KPAA, 2007).

Notably, the Korea Patent Attorney Association (KPAA) played the capital role in launching the Korea Intellectual Property Office (KIPO). More specifically, the Association blocked the closing of the Patent Bureau when the Korean government considered the closing as part of its organization reform plan. Further, the Association argued that such a Bureau responsible for intellectual property is critical in enhancing export competitiveness through scientific/technological development. It continued to suggest enhancing the Patent Bureau activities and elevating it to the Korean Intellectual Property Office. Thanks to its effort, the Korean Intellectual Property Office was established in 1977. Looking back at the early phase of Korea's IPR development process, Korea's patent attorney system played the important role in promoting invention activities and localizing the IP system.

3.2 Efforts to Modernize the Patent Administration: Launch of the Korean Intellectual Property Office

Since the economic development plan started in the 1960s, the Korean economy and technological capability has remarkably grown,⁷ and more and more domestic firms have entered and expanded into the international market. By doing so, domestic firms realized

⁷ The annual growth rate during the period of 1962-1972, when the first and second five-year economic development plans were implemented, was 8.8%.

the importance of IPRs in gaining international competitiveness (See Appendix 1 and 2). Along with Korean economic growth, the number of patent applicants in Korea has consistently increased. For instance, the total number of patent applications increased from 858 in 1961 to 1,060 in 1966 (see Table 2-2). To effectively respond to the rapid increase in IPR-generating activities in Korea, the Patent Bureau expanded the organization and secured 100 employees in 1966 (Korean Intellectual Property Office, 2007).

Table 2-6 | Examination disposals or pending applications (1973-76)

Classification		1973	1974	1975	1976
Examination	Application	25,854 (14.3%)	26,561 (2.7%)	26,387 (Δ0.7%)	28,694 (8.7%)
	Disposal	23,630 (21.2%)	22,356 (Δ5.4%)	15,092 (Δ32.5%)	22,825 (51.2%)
	Pending	21,312 (11.7%)	25,517 (19.7%)	35,812 (44.3%)	42,681 (15.9%)
Trial	Request	772 (Δ6.3%)	826 (7.0%)	957 (15.9%)	1,195 (25.0%)
	Disposal	914 (9.5%)	854 (Δ6.6%)	652 (Δ23.7%)	677 (3.8%)
	Pending	406 (Δ26.0%)	377 (Δ6.9%)	682 (80.9%)	1,201 (76.1%)

Note: The increased rate is depicted by the percentages in parentheses, compared to the previous year and the total number of judgments and appealed judgments.

Source: 1978 yearbook from Korean Intellectual Property Office, recited as KIPO (2007, 58)

Korea continued to experience the dramatic increases in patenting activities, as the Korean economy shifted toward heavy and chemical industries, which require more advanced technology in the 1970s. Due to the consistently increasing activities for generating IPRs, the number of pending applications had remarkably accumulated from the early 1970s. As seen in Table 2-6, there were fewer IP examinations conducted than applications submitted in 1973. Hence, the number of pending applications where examinations were not conducted rapidly increased from 21,312 in 1973 to 42,681 in 1976. In the case of trial, the number of cases where judgments were not conducted rapidly grew, along with the growing number of trial requests. As seen in Table 2-6, the number of pending applications in 1976 was 1,201, an increase of 197% from 406 cases in 1973.

As this problem of unprocessed examinations and trial requests from the 1970s emerged, people started to raise their voices for reform of the Korean patent administration system (Korean Intellectual Property Office, 2007). Accordingly, the Korean Patent Bureau under

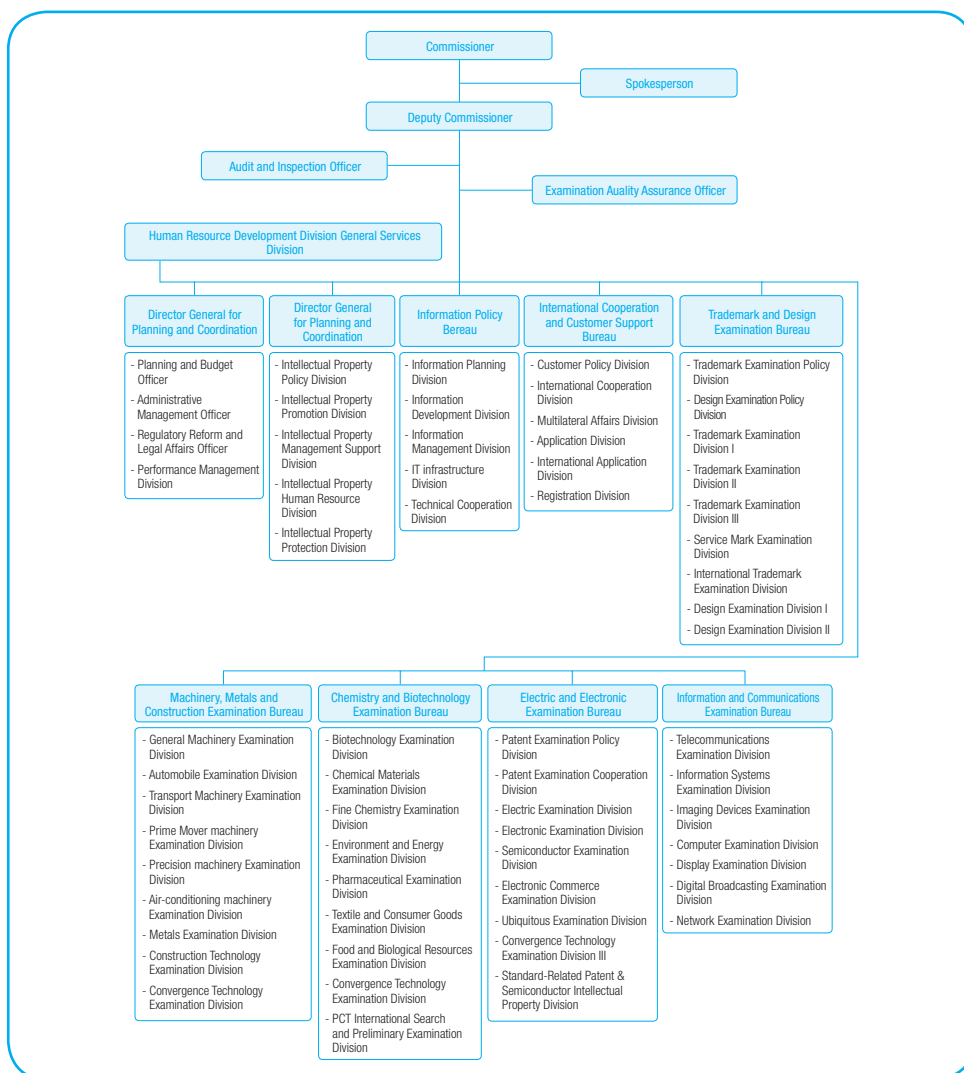
the Ministry of Trade, Industry, and Energy was expanded and promoted in status to the Korean Industrial Property Office in March 1977. To effectively administer IPR policy, the bureau became independent in 1977 and was renamed the Office of Patent Administration, headed by a commissioner with vice-ministerial rank. The office adopted the name “Korean IP Office (KIPO)” in 1988 and formally changed its name to the “Korean Intellectual Property Office (KIPO)” in June 2000 to better reflect its overall functions.

Other than resolving the problem of accumulated unprocessed cases, another objective of KIPO was to support technological development to make Korea competitive in the international market place and to ensure that Korea’s patent administration policies met the international criteria, beyond just the registration process (Korean Intellectual Property Office, 2007). To achieve this goal, KIPO established the First Modernization Plan (1980-1986) in 1977. According to the Memorandum of Agreement on Korea’s modernization plan between KIPO and the UNDP, KIPO was funded by the United Nations Development Program (UNDP) in October 1978. The main objectives of the modernization plan were to: redesign the IPR rules, improve the quality of the IP examiners and IP judges, secure patent information materials, establish the management system, develop/modernize the computer system, and enhance the effectiveness of patent administration through reform of the administrative organization. Korea was provided with \$597,929 from the UNDP for the project to modernize the patent office. (KIPO, 2011: 1213). At first, the project period was scheduled from 1980 to 1984 but it was extended by two years (1985, 1986) thanks to additional support by the UNDP. The first project was successfully completed at the end of 1986. Since 1980, through supplemental funds of approximately \$600,000 granted by the UNDP, budgets of the office, WIPO’s development cooperation funds, and diverse support from other advanced countries, KIPO successfully established an advanced IPR system (KIPO 2007).

As a result of the restructuring of the organization to a more efficient agency, Korea’s IPR policies for the technological/industrial developments are now, being more effectively implemented. KIPO was appointed to serve as an International Searching Authority by the member countries of the PCT in 1997, and in 2005, based in large part on its reputation for excellence, the USPTO designated KIPO to act as an International Search Authority for the U.S.-originating PCT applications. That designation thrust KIPO into the limelight and greatly increased its status as well as its workload. Now, KIPO is one of thirteen patent offices,⁸ which are entrusted to undertake international searches.

8 The International Searching Authorities are the European Patent Office, the National Patent Offices of Japan, the United States, Korea, Canada, Australia, China, Sweden, Spain, Austria, Russia, Finland, and the Nordic Patent Institute. In addition, the patent offices of Israel, Egypt, Brazil and India have been appointed as International Searching Authorities, but they have not yet begun acting.

Figure 2-3 | KIPO's Organization



Source: www.kipo.go.kr

Now, KIPO is the authoritative governmental office for IPR among the 9 central administrative organizations in Korea (see Figure 2-3). KIPO supports the effective creation, utilization, and protection of IPR, including patents, trademarks, and industrial designs, by examining and granting IP applications, administering IPR laws, promoting and protecting intellectual endeavors, and developing the national policy on IPR. It is a comprehensive organization with a mission “to enhance technological innovation and industrial development by facilitating the creation, commercialization, utilization, and protection of intellectual property. KIPO’s main responsibilities are the following:

- Examination and registration of patents, utility models, industrial designs and trademarks (including service marks), trade secrets protection policies and registration of semiconductor chip layout designs;
- Investigation and settlement of IPR-related disputes (IP Tribunal);
- Anti-counterfeiting activities;
- Management, computerization and dissemination of IPR information and documentation at home and abroad;
- Encouragement of inventive and innovative activities;
- International cooperation in the IPR field;
- Human resources development in the IPR field;

In summary, in the 1970s, the number of IP-related applications rapidly increased since an enhanced IPR awareness took place through growing technology development activities and international activities of domestic firms. Subsequently, the Korean Industrial Property Office was launched in 1977 (later renamed the Korean Intellectual property Office [KIPO] in 2000), to establish an improved IP administration system. KIPO, with better qualified IP examiners and judges, together with monetary support from the UNDP, has been successful in modernizing the administration of Korean IP. Given the roles of Korea's patent administration policies for industrial/technological development, its history can be divided into the eras before and after the existence of KIPO (1977).

2011 Modularization of Korea's Development Experience
Korea's Intellectual Property Rights System and its
Application to the Phases of Industrial Development
: Focusing on the Patent System

Chapter 3

The Second Developmental Phase of Korea's IPR System: Settlement Period (1980-late 1990s)

1. Overview of the Settlement Period
(Second Period: from 1980 to the late 1990s)
2. Major Details of Patent System and Policy
3. Administration Institutes and Infrastructure for Patents

The Second Developmental Phase of Korea's IPR System: Settlement Period (1980-late 1990s)

1. Overview of the Settlement Period (Second Period: from 1980 to the late 1990s)

In the period from the 1980s to the late 1990s Korean firms started expanding their international market share of knowledge-intensive industries such as electronics, automobile, and mechanical engineering industries (see Table 1-2). Realizing the limitation of the licensing and embodied technology transfer, domestic firms during this period put great efforts on R&D activities for technological innovations (Lee&Kim, 2010). Thus, their technological capabilities started to initiate product innovations that adhered to global standards and had the capability for process improvement (OECD, 1996; see Table 1-2). With this growth of technological capability of domestic firms, the number of domestic patents dramatically increased and then surpassed that of foreign patents in 1994 and 1995 (see Table 3-1). The corporate share strikingly increased as well.⁹

⁹ Lee&Kim (2010) argued that the enhancement of in-house R&D activities by the firms paved the way for corporate patents to surpass for the first time the share of individual patents.

Table 3-1 | Trends of Major IPR Variables in Korea

	1981	1985	1990	1994	1995
R&D/GDP	0.62	1.41	1.72	2.32	2.37
Foreign Patents	3,984	7,8884	16,738	17,148	19,263
Domestic Patents	1,319	2,703	9,082	28,564	59,236
Domestic Share (%)	24.9	25.5	35.2	62.5	75.5
Utility Model [A]	9,064	18,548	22,654	39,806	59,866
Invention Patents [B]	5,303	10,587	25,820	45,712	78,499
Ratio [A]/[B]	1.71	1.75	0.88	0.87	0.76
Individual (Korean) Patents	1,0781	1,495	1,815	4,182	3,942
Corporate (Korean) Patents	241	1,208	7,267	24,382	55,294
Corporate share (%)	18.27	44.69	80.02	85.36	93.35

Source: Lee&Kim (2010, 137)

As more industrial technologies of domestic firms were rapidly improved during this period, an advanced IPR system was required to encourage technological development in preparation for the era of international free competition (See Appendix 3). There were great efforts put forward to transform Korea's IPR system to meet international standards. In 1980, an overall amendment to the IP laws was carried out (Jeong, 2004). In addition, Korea started joining international treaties to keep in line with patent policy changes in the international area (see Appendix). First, Korea became a member of the World Intellectual Property Organization (WIPO) in 1979, and then actively joined the international treaties such as the Patent Cooperation Treaty (1984) and the International Patent Training Center (1987). In the middle of joining international communities, Korea's IP laws were substantially modified (see Appendix). For example, the 1982 patent law added articles specifying the international application procedures in order to join the PCT. By doing so, Korea's IPR system became more globalized during this period.

Another issues related to Korea's IPR development process during this period was the substantial increase in IPR protection promoted by the Korean government. As the United States, which was the largest trading partner, continued to force Korea to enhance its IPR protection to promote good trade relations with Korea, the 1986 patent laws were considerably modified to increase the degree of Korea's IPR protection under the Korea-U.S. IPR MOU. The 1986 patent laws enlarged the scope of patentable subject matter to include pharmaceutical inventions and methods of producing pharmaceutical substances. In addition, it extended the term of patent protection from 12 to 15 years from the grant of the patent or 18 years from the application date. Also, the patent right was further strengthened by including provisions of WTO/TRIPS in 1995. In sum, Korea's IPR system was reformed and strengthened during this period to reach global standards.

Summarizing the development process of the IPR system and policies in the Settlement Period, Korea's IPR system became more globalized and strengthened to meet global standards along with the rapid development of technological capability. This chapter deals with Korea's efforts to keep up with the international IPR system. More specifically, Section 3.2 deals with the government's efforts to develop the global level of Korea's IPR systems. The opening of the International Patent Training Center in 1987, as well as the introduction of the self-supporting accounting system for actively responding to changes in the international IPR environment will be covered in Section 3.3.

2. Major Details of Patent System and Policy

2.1 Efforts to Integrate into the International System: Joining International IP Communities

As the focus of Korea's economic development plan shifted from light-industry to heavy and chemical industries in the 1970s, the IPR system was required to be internalized to attract more technologies from advanced foreign countries.¹⁰ Along with the growing demand of foreign technology for indigenous technological development, the Korean economy was gradually exposed to global competition. Against this backdrop, Korea started joining international treaties to keep up with patent policy changes in the international area in the late 1970s (Jeong, 2004). <Table 3-2> below shows the current status of the international agreements Korea has signed.

Korea first joined the convention upon the establishment of the WIPO in 1979. There were two main reasons why Korea considered signing the WIPO treaty at first (KIPO, 2007: 809). First, Korea could receive diverse benefits from WIPO projects supporting developing countries. Second, joining the WIPO was the first step towards signing the Paris Convention. By doing so, Korea's status in the international community could be improved by joining the WIPO (Ibid.). Afterward, Korea revised the patent law in compliance with the Paris Convention for the Protection of Industrial Property¹¹ in order to sign the Paris Convention in 1980.

10 To become an attractive market for technology licensing, the patent system, which effectively enables the inventors to protect their technology, should be enhanced.

11 The Paris Convention protecting industrial property rights was agreed to on March 20, 1883 in Paris and is a basic international convention concerning industrial property rights. This Convention had been amended six times, the first time in Brussels in 1901, Washington in 1911, The Hague in 1925, London in 1934, Lisbon in 1958, and Stockholm in 1967. The main points of the Convention are the principle of equality of domestic and foreign people, the principle of priority, and the principle of patent independence.

Table 3-2 | Status of Joining Conventions Related to Patent (as of August 2011)¹²

Name	Objective	Number of Members	Approval Date (Effective Date)	Date Korea Joined
Convention on the Establishment of WIPO	To establish the World Intellectual Property Organization	184 countries	07.14.67 (04.26.70)	03.01.79
Paris Convention (Protecting industrial property rights)	The basic charter to protect industrial property right	173 countries	03.20.83 (07.07.84)	05.04.80
Patent Cooperation Treaty (PCT)	Cooperate in terms of the process of applying for international patents (utility models)	144 countries	06.19.70 (01.24.78)	08.10.84
Budapest Treaty (Deposit of microorganisms)	International approval of deposit of microorganisms	75 countries	04.28.77 (08.09.80)	03.28.88
WTO/TRIPs	Regulations related to trading of intellectual property rights	148 countries	04.15.94 (01.01.95)	01.01.95
Strasbourg Agreement (International Patent Classification)	International Patent Classification	61 countries	03.24.71 (10.07.75)	10.08.99
UPOV (Convention on protection of new varieties of plants)	Protection of new varieties of plants	67 countries	12.02.61 (08.10.68)	01.07.02
Patent Law Treaty (PLT)	Make procedures convenient and simplify the procedures	28 countries	06.02.00 (04.28.05)	Review whether to join
Substantive Patent Law Treaty (SPLT)	Unification of substantive patent	-	In progress	-

Signing the Paris Convention meant that Korea was opening its patent system to the world. Foreigners were better able to obtain patent protection in Korea and simultaneously Korean inventors were also able to more easily obtain patents in overseas countries. The commitment to extend the national treatment to foreigners as prescribed in the Paris Convention, along with the right of priority under the Convention, led to a sharp increase in the number of applications for industrial property rights filed by foreign parties in Korea.

¹² Refer to the homepage of the World Intellectual Property Organization (WIPO) and the book entitled, *The Theory of Patent Law* (2002).

For further efforts to achieve a prominent place in the international patent community, Korea considered joining the Patent Cooperation Treaty (PCT)¹³ in 1982. The main reason for joining the PCT was that it could revitalize technology transfer and investment by providing an environment where Korean firms and foreign firms were better able to obtain patents in a country and out of a country. In order to become a member of the PCT, Korea amended the patent laws related to international applications for patents (see Appendix 1). On August 10, 1984, Korea signed the PCT and the country was able to remarkably improve its procedures for international applications for patents.

By signing the Paris Convention and the PCT, Korea became easier for inventors from foreign countries to protect their technology in Korea. As a result, the number of technology transfer from foreign countries, as well as foreign direct investment (FDI), increased substantially (Jeong, 2004; see Appendix 1). As shown in <Table 1-3> in the first chapter, the payment of technology transfer as well as FDI had been markedly increased during the period of 1982-1991.

In July 1987, the substance patent system was introduced in Korea under commercial pressure from the U.S., so in December 1987, the Korean government prepared to join “the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure” to make it possible to deposit microorganisms with international organizations (KIPO, 2007). When Korea signed the Budapest Treaty in 1988, it was able to freely obtain microorganisms deposited in international depositories and activate such international exchange as mutually communicating about information pertaining to microorganism strains between countries or international organizations, which led to the growth of microorganism-related industries (Jeong, 2004).

The WTO TRIPS Agreement reached through the Uruguay Round in 1993 also had a significant impact on the IP regime in Korea. In 1994, Korea was more urgently pressed to modify its IP laws in compliance with international norms. Since the WTO took on the role of controlling worldwide IPR protection under the TRIPs Agreement concluded in 1994, it began to demand that its member countries amend their IP laws in accordance with the Agreement. Thus, Korea completed the revision of related laws in compliance with the Agreement by the end of 1998 and sent the notification of the revised laws to the Council for TRIPs. With the five-year grace period ending, Korea conducted a legislative review of its IP-related laws and it was confirmed that all the IP-related laws are in full compliance with the Agreement. The main features of the amendment comply with the TRIPS regulations by enlarging the scope of patentable subject matter, extending the term of patents to 20 years.

13 The Patent Cooperation Treaty, a special agreement under the 19th Article of the Paris Convention, was agreed to in a meeting among diplomats held in Washington, D.C., in 1970 as a multinational agreement. Korea signed the PCT on August 10, 1984. The PCT was meant to resolve problems caused by duplicate applications and examinations, as applications for patents had increased due to dramatic international scientific and technological innovation, and there had been many applications from foreign firms insisting on priority in the international arena.

The Patent Law Treaty regulating unification of patent-related procedures was then approved in June 2000. The Substantive Patent Law Treaty¹⁴ to regulate unification of the substantive patent is currently being discussed. If the Patent Law Treaty takes effect to unify patent procedures and major countries join the treaty applicants will be able to use a prompt, affordable, and stable service. Furthermore, if the examination criteria for each country's patent office are unified thanks to the approval of the Substantive Patent Law Treaty, mutual recognition of examination results will be possible. This will reduce the examination period and examination fee and lead to more stable examination results.

By actively participating in the international IP community, the credibility of Korea's patent system has been improved among foreign/domestic inventors who intend to license their technology in the Korean market. The enhanced IPR system dispelled the fear of possible infringements of patent rights among the technologically advanced countries (See Appendix 2). The Korean patent system is now readily acknowledged as one of the world's most advanced (Jeong, 2004; see Appendix 1). Korea's status as an intellectual property power is readily evidenced by Korea's role as a PCT International Searching Authority.

2.2 Efforts to Strengthen Patent Rights at the International Level: Introduction of Substance Patents

As Korea announced its openness to the patent system by joining the Paris Convention in 1980, Korea's patent law related to substance patents gained attention from the international IP communities (KIPO, 2007). In 1981, the United States, Korea's largest trading partner, officially requested Korea to adopt the substance patent by insisting that patent rights of American firms were being infringed in the Korean market. At that time, its introduction was strongly opposed by related industries in Korea, the pharmaceutical industry in particular. They argued that they would be affected negatively because they have heavily relied on producing generic drugs by improving the production process of the existing drugs, given the lack of technology and R&D capability to develop new drugs. They were also concerned about the increasing burden of royalty payments.

However, due to trade pressure from the U. S. Super 301 in 1985, Korea and the United States concluded an agreement for Korea to introduce the substance patents for pharmaceutical and chemical materials. When the product patent system was introduced on July 1, 1987, Korean pharmaceutical firms and firms manufacturing agricultural chemicals strongly opposed this action with concerns that they would be overtaken by foreign firms

14 The Substantive Patent Law Treaty (SPLT) is an international treaty for unification of criteria to judge points of patent law to "harmonize" such substantive requirements as: definition of prior art, sufficient disclosure of the invention, industrial applicability/utility, drafting and interpretation of claims, inventive step/non-obviousness, grace period, patent targets, novelty, sufficient disclosure, claim, definition of prior art, among others. Negotiations among the participating countries, and as of the fifteenth session the WIPO's Standing Committee on the Law of Patents (SCP) which was held from October 11 to 15, 2010, Member States had yet to reach a unified, definitive conclusion relating to the above criteria/requirements.

due to the foreign firms' strong protection of medical products' patent rights (See Appendix 2). Specifically, the domestic industries were strongly opposed to the introduction for the following reasons: the inability of imitating foreign products, domestic industries' subjugation to foreign countries, increased prices of relevant products, damage to small- and medium-sized firms, and the impact on the exportation of chemical products. The result was that domestic industries were not able to grow nor could they pay higher royalty to foreign firms.

When the decision to introduce the substance patent system was made in 1986 there were vigorous movements against it. For example, the Federation of Korean Industries (FKI), Korea Industrial Technology Association (KOITA) and 14 relevant organizations united and presented a petition citing strong opposition to this issue. Against this backdrop, the government did its best to proactively sway the opinions of stakeholders through research on the substance patent system in hopes of alleviating objections by firms and other possible adverse effects (see Appendix 2¹⁵). For example, relevant governmental ministries founded the "Committee for the Substance Patent System" under the leadership of the Vice Minister of the Economic Planning Board. The objective was to establish a conventional solution to nurture relevant industries and set up and implement effective policies. To facilitate the resolution of issues, the committee also strived to actively gather opinions from relevant industries through "private consultation on substance patents."

The Ministry of Health and Social Affairs and the Ministry of Agriculture and Forestry also established a policy for supporting technological development, including incentives when relevant technology was introduced together with the support for pharmaceutical and agricultural chemical firms to develop substance patents (See Appendix 2). With the support of WIPO, KIPO sent examiners to the United States and European countries to jointly formulate guidelines for the examination of substance patents and receive IP examination training. Thanks to these kinds of international-level efforts, a domestic company was able to apply for a substance patent within one year after the system was introduced. Consequently, domestic firms' development of pharmaceutical and agricultural technology was promoted (Ibid.). Relevant domestic industries were thus revitalized due to the government's policy efforts to introduce the substance patent system on July 1, 1987, and domestic pharmaceutical firms' active response. As a result, investment in research and development increased, research institutes expanded, and the number of applications for relevant patents also grew. Domestic industries centered on the "private committee on substance patents" also proposed founding an activity test center, an essential facility for new-materials research and development, a stability test center, a gene bank, and establishment of a new-materials information network. It also coordinated such measures as expanding research and development funding and enhancing the direction of research and development.

15 Domestic pharmaceutical firms and firms manufacturing agricultural chemicals strongly opposed the introduction of the product patent system by insisting that it took 10 years for a domestic company to apply for only one patent.

Since most firms in the related industry did not conduct serious and innovative R&D before the introduction of substance patents in the late 1980s, the proportion of applications by Koreans accounted for only 5.6% of the total number of applications from 1987 to 1990 (see Table 3-3). However, Korean firms rapidly changed their strategies towards more innovative R&D investment in order to overcome the limitation of the existing imitative R&D. Thus, they started to establish more research labs in related fields such as chemistry. After the mid 1980s, the number of corporate R&D centers in Korea began to substantially increase. Since large Korean firms opened R&D laboratories in major industries in the late 1960s (Amsden 1989), the number of corporate R&D centers rose from 3 in 1967 to 14 in 1976 (Ibid.). As shown in <Table 3-3>, there were 45 such centers in 1981. By 1986, a mere five years later, the number increased more than fivefold. In particular, in 1986 the number of newly established R&D institutes per year abruptly increased by more than 100% and the number of corporate R&D centers was more than 200 in 1986. There were more than 500 R&D centers in 1988 and approximately 1,000 in 1991, as shown in <Table 3-3>. The rise in the number of corporate R&D centers indicates that more Korean firms were able to fund their own internal R&D activities. The primary purpose of such laboratories originally lay in facilitating the transfer of designs and production processes from overseas. Their roles later became more focused on the development of new products (Amsden, 1989).

Table 3-3 | Establishment of Corporate R&D Centers by Year and Field

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
New establishment	45	26	31	31	39	89	145	146	110	121
Accumulated No.	45	71	102	133	172	261	406	552	662	783
Year	1991	1992	1993	1994	1995	1996	1997	1998		
New establishment	179	200	238	263	313	394	556	834		
Accumulated No.	962	1162	1400	1663	1976	2370	2926	3760		

Source: Korea Industrial Technology Association available at www.koita.or.kr

Along with the growing activities of R&D of domestic firms, the number of substance patents applications had increased (see Table 3-4). In the mid 1990s the amount exceeded 20% and the number of applications by foreigners rarely increased, while the number of applications by Koreans dramatically increased. These statistics were indirect evidence that domestic firms, responding to the introduction of the substance patent system, actively pursued research and development activities.

Table 3-4 | Statistics of Application for Substance Patents

(Unit: Number of Cases, %)

Category		'87-'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00
Koreans		354 (5.6)	161 (10.0)	173 (12.8)	243 (18.4)	346 (18.4)	311 (21.3)	347 (24.2)	582 (30.2)	547 (27.0)	464 (23.1)	365 (21.4)
Foreigners	USA	1,643	368	310	284	301	285	360	364	402	582	488
	Japan	1,549	356	229	250	289	253	270	331	335	325	278
	Western	2,604	684	636	516	487	582	445	618	713	626	570
	Other	154	40	39	28	21	27	9	30	32	17	4
	Total	5,950 (94.4)	1,448 (90.0)	1,214 (87.2)	1,078 (81.6)	1,098 (76.0)	1,147 (78.7)	1,084 (75.8)	1,343 (69.8)	1,482 (73.0)	1,550 (76.9)	1,340 (78.6)
Total		6,304	1,609	1,392	1,321	1,444	1,458	1,431	1,925	2,029	2,014	1,705

Source: The third Examination Bureau under KIPO

Note: () is the proportion of the entire number of cases applying for substance patents

The research and development expense of the top 100 pharmaceutical firms, compared to their sales, increased from 2.87% in 1988 to 4.09% in 1995, and the number of pharmaceutical firms' research institutes grew from 31 in 1985 to 96 in 1996 (Jeong 2004). As such, it appears that the introduction of the substance patent system has contributed to the invigoration of research and development of pertinent industries. The below Table 3-5 indicates that the introduction of the substance patent system influenced foreign direct investment, given foreigners' direct investment amount in each manufacturing area (Jeong, 2004). Due to the introduction of the system in 1987, the foreign investment ratio of the chemical industry to the pharmaceutical industry increased from 12.5% (chemical industry) to 2.6% (pharmaceutical industry) between 1962 and 1986 and from 18.4% (chemical industry) to 3.4% (pharmaceutical industry) between 1987 and 1990, respectively. It is estimated that foreign investment was revitalized because the IP of the highly advanced technologies of the chemical and pharmaceutical industries were protected by patents. Consequently, it can be assessed that the introduction of the substance patent (1987) promoted Koreans' and foreigners' activities for technological innovation in the chemical and pharmaceutical industries (see Appendix 2).

Table 3-5 | Foreign Direct Investment (FDI) by Domestic Manufacturing Areas

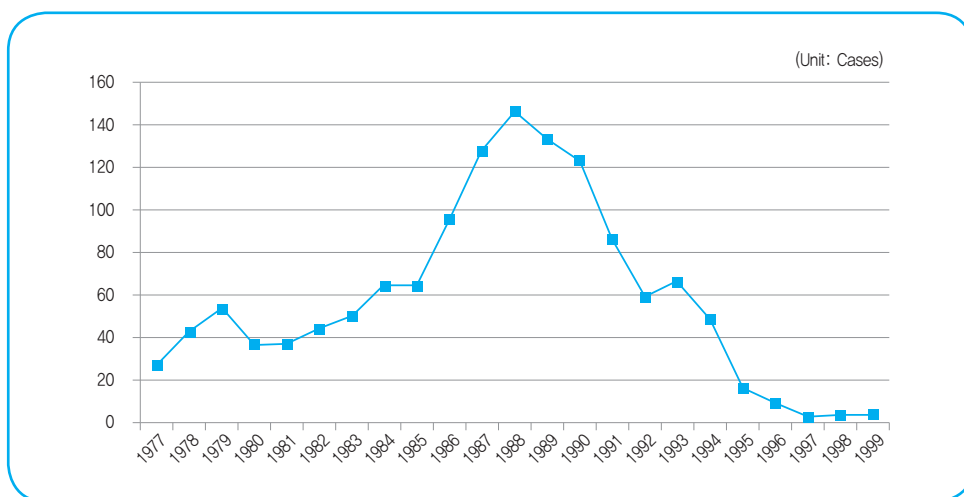
Industry	1962-1986	1987-1990
Chemical Industry	18.2 (12.5)	195.4 (18.4)
Medical Industry	3.8 (2.6)	36.9 (3.5)
Total in Manufacturing Industry	92.8 (63.9)	707.4(66.7)
Total Foreign Direct Investment	145.2 (100)	1,060.6 (100)

Note: () is the proportion of total foreign direct investment (FDI)

Source: “Current Status of International Investment and Introduction of Technology” from the Ministry of Finance and Economy in 1997 and data from Jeong (2004, 18) are reused.

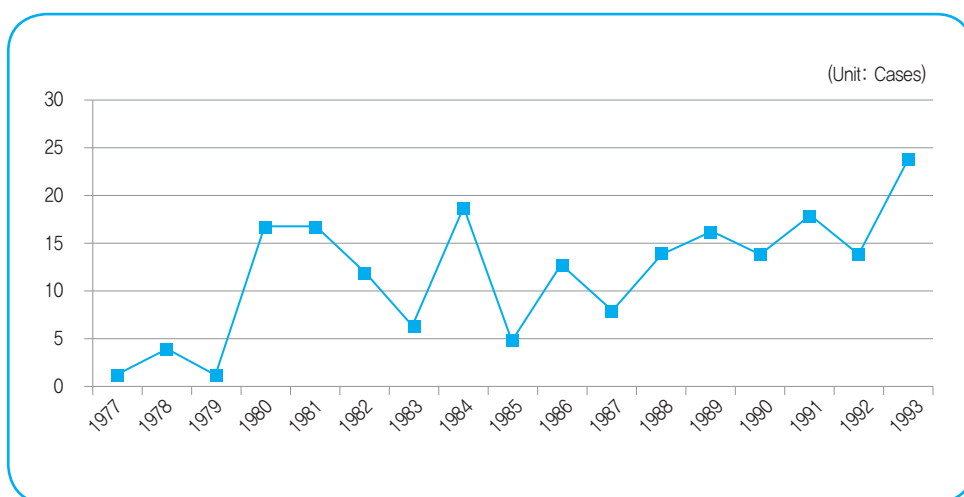
After the introduction of the substance patent system in 1987, a number of technology transfers vigorously took place in the chemical industries (see Figure 3-1). When it comes to the pharmaceutical industries, the number of technology transfers increased from 1987 to 1993 (see Figure 3-1). The introduction of the substance patent system has encouraged technology transfer in the chemical/pharmaceutical industries. It is because the protection of technologies pertaining to substance patents encourages technology transfer, which consequently led to technological development in these industries. Overall, the introduction of the substance patents encouraged domestic activities for technological innovation, inflow of foreign direct investment, and technology transfer.

Figure 3-1 | Cases of Technology Transfer in Chemical Industry



Source: KIPO's Database, cited from Song and Shin (2006, p.55)

Figure 3-2 | Cases of Technology Transfer in Pharmaceutical Industry



Source: KIPO's Database, cited from Song and Shin (2006, 55)

However, the number of the substance patent applications started to decrease since the year 1998. Furthermore, the Korean market share of foreign pharmaceutical firms (technologically advanced countries) markedly increased from 8% in 1999 to 22.2% in 2002 and to 27.3% in 2005,¹⁶ along with growing foreign direct investment. Among the top 10 products based on revenue Seoul-headquartered LG Life Science's Zanidip is the only Korean product. Even among the top 20 products, there is only Itopride, a prokinetic drug manufactured by JW Pharmaceutical Corporation, and gastroprokinetic function dyspepsia drug Gasmotin, manufactured by Daewoong Pharmaceutical Co., Ltd. Technologically advanced countries strongly protect their IPR to avoid being pursued by competing countries in terms of technology development. This strategy led to an increase in market occupancy that created a comparative advantage over smaller, competing countries. As such, the exclusive right of patents related to pharmaceuticals is stronger than that of other industries so even now the pharmaceutical firms are opposed to strengthening patents (See Appendix 1).

Indeed, when the substance patent system was introduced stakeholders showed strong opposition; however, because of pressure from the United States, an agreement was ultimately reached. Recently, the majority of Korean pharmaceutical firms have opposed the approval-patent linkage system, which was introduced through the Republic of Korea-United States Free Trade Agreement (KORUS FTA)(See Appendix 1). This is a free trade agreement between the United States and the Republic of Korea centered around tariffs on goods and protections for multinational financial services and other firms (the United States' first free trade agreement [FTA] with a major Asian economy and its largest trade deal

¹⁶ "Reckless Attack by the US Pharmaceutical Firms," April 28, 2006.
[source: <http://www.hani.co.kr/arti/economy/economy21/119475.html>]

since NAFTA). In response to Korean pharmaceutical firms' opposition to the approval-patent linkage system, the Korean government needs to implement conventional policies to resolve problems of expansion of foreign pharmaceutical firms' market occupancy and the contracted domestic pharmaceutical industry. To achieve better effectiveness of the substance patent policy, the Korean government has to make the utmost efforts to promote technology development of relevant industries through diverse policies. Especially in the case of developing countries, the government needs to be very careful in terms of implementing policies that consistently support its industries.

3. Administration Institutes and Infrastructure for Patents

3.1 Efforts to Nurture International Human Resources: Establishment of the International Intellectual Property Training Institute

From the early 1970s the increased involvement in the international IP markets highlighted a number of social concerns and elevated the importance of IP professionals who play the capital role in utilizing and protecting IPRs. However, in the early 1970s the training for IP examiners and trial examiners was essentially on-the-job training, with no specialized IP oversight and/or legal courses offered. Despite the previously organized industrial property training administered in the mid 1970s, it was not sufficient enough to nurture examiners and trial examiners for IPR training at the international level. In particular, as industrial technologies rapidly developed and applications in advanced technological areas (such as substance patents) significantly increased, it was necessary for the competency of examiners and judges to markedly improve. Since there was no dedicated specialized training institute to accommodate this need, it was difficult to accomplish the goal of better educating the examiners on the IP oversight and legal domains. To answer this need, then-chairman of KIPO proposed the establishment of the International Intellectual Property Training Institute (IIPTI) as a policy measure.

At the end of the Fifth Republic (the government in South Korea from 1979 to 1987 that made extensive efforts at reform), it was financially quite difficult to establish a new government organization (the training institute) even tapping the reserve contingency fund. The Chairman of KIPO, however, proactively persuaded the President in a bilateral meeting to utilize the government's reserve contingency funds so that the chairman was able to successfully establish the specialized institute for the first time in the history of Korea. Despite the fact that it is common to utilize the government's reserve funds only for contingency events, it was an unprecedented decision in this regard. It was telling of the distinctive and unique efforts made by the Korean government to join the international IP arena (KIPO 2007).

According to the Korea-U.S. IPR MOU signed in 1986, Korea had to further enhance its IPR system involving the introduction of the substance patents for pharmaceutical and chemical materials. At that time, Korean industries' IPR awareness was quite low and from an international perspective the professional capability of the KIPO IP judges was insufficient. It was urgent to cultivate IP professionals, particularly examiners and trial examiners of KIPO, new patent attorneys, IP managers of enterprise, and researchers at universities and research institutes.

Thus, the International Intellectual Property Training Institute (IIPTI) was founded under the authority of KIPO on July 15, 1988 to expand the opportunities for IP education. The establishment of IIPTI, which is a professional institute that provides education on intellectual property (IP) in Korea, heralded in a new era for IP education. The IIPTI, as the first Korean IP training institute, had the following goals.¹⁷

- To offer special training courses to help KIPO staff achieve a world-class standard of patent administration
- To develop the expertise of IPR experts in the private sector through training courses, tailored to meet their needs and the needs of their customers
- To introduce a system of grooming invention geniuses with the help of experienced IP specialists and the systematization of invention education
- To establish international cooperation and substantial IPR education for international participants so as to make Korea an IP hub
- To create advanced online IPR invention education through high-level IPR education information systems

According to the Patent Law Enforcement Order, revised in July 1987, training for IP examiners was made separately. After the establishment of the patent examination court and patent court in 1998 a training course for “judges and technological examiners” was established to educate professionals in trial and litigation activities, as well as to enhance the competency of examiners and judges. In addition, a training program for citizens was introduced to nurture specialists for IP management and to enhance the response capability of patent conflicts. Invitations were also made to appropriate international groups to participate in the IIPTI's training program, in cooperation with WIPO and the UNDP, as a means of reaching out to international countries, especially developing countries, to raise the level of international cooperation in the IP area.

WIPO, which whole-heartedly welcomed the establishment of the IIPTI, assisted with funding in the amount of USD \$300,000 in UNDP capital for four years after 1987 to execute programs inviting international experts and dispatching public officials for KIPO training, while ensuring the IIPTI play a role as a specialized institution for the Asia-Pacific

¹⁷ Available at http://www.kipo.go.kr/kpo/user.tdf?a=user.english.html.HtmlApp&c=91003&catmenu=ek02_03_01#_

region (KIPO 2007). In this vein, in 1987 the IIPTI introduced an IP course for foreigners and started to host the KIPO Asian regional seminars in cooperation with WIPO.

The IP training programs have greatly expanded Korea's IP opportunities by not only providing better education for the KIPO examiners and judges; employees of economic authorities; judicial apprentices; teachers who coordinate students' inventions; but also to operate various training programs for patent attorney apprentices and the general public, such as employees of businesses and university students. As the first training institute in the developing countries, IIPTI has been recognized as the representative training center for IP. Now, Korea has firmly established its international status as an advanced nation among the developing countries in the IP international arena (See Appendix 1).

3.2 Efforts for Flexible Responses for International Systems: Operation of an Independent Profit System

In the mid 1980s, amid strong pressure to open its doors to IP opportunities, including substance patents and the increasing importance of IP interests at home and abroad, heightened interest and activities in IPR resulted in the need for increased KIPO funding. Since there was a limit to its budget expansion, it became necessary for KIPO to urgently introduce a special accounting plan to expand the budget and to secure operational flexibility (KIPO, 2007).

In 1987, the relevant law (Executive Order 12167) was revised to enact a Patent Management Special Accounting program. The independent profit system started to operate in line with the law as of 1988. It was enacted to take countermeasures to address rapidly increasing IP applications, IP-related human resource needs, competence development for IP examiners and judges, international IP expansion, and to establish a robust domestic IP system. From the period after the introduction of the special accounting office in 1988 to 1991, the business budget for large-scale projects, such as the development of the IIPTI, was secured and the budget rose to 168.9%, with an expansion of operating expenses, due to an increase in diversified businesses (KIPO 2007, 1144). The budgetary expansion effort was largely attributable to the special accounting budget allowing for tax spending equivalent to tax revenue.

With budgetary expansion and flexibility in its operations function after the introduction of the Patent Management Special Accounting law, KIPO was able to efficiently execute IP policies for effective and efficient industrial and technological development. KIPO was also now able to shorten the IP examination period and modernize such IP-related administrative procedures as invention promotion projects, information dissemination, and human resource expansion (KIPO 2007). In summary, KIPO laid the foundation for patent administration in the 1980s after its launch in 1977, and in order to modernize the patent administration process KIPO secured independence in its budget operation activities with the introduction of the Patent Management Special Accounting plan in 1988.

Table 3-6 | KIPO Budget Developments from the Introduction of Special Accounting Plan to Financial Independency (1988-1998)

Description	Patent Management Special Accounting										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Tax revenue (tax expense)	17,508 (6,423)	13,265 (1,044)	18,594 (4,346)	23,252 (4,606)	25,385 (2,812)	27,894 (2,300)	31,126 (2,600)	39,907 (4,796)	50,937 (10,495)	69,416 (5,821)	96,761 (0)
YOY growth rate	308.6	Δ24.2	40.2	25.1	9.2	9.9	11.6	28.2	27.6	36.3	39.4
Financial independency ratio	63.3	92.1	76.6	80.2	88.9	91.8	91.6	88.0	79.4	91.6	100

Note 1. Figures in parentheses are the funding amounts transferred from general accounting.

2. Financial independency ratio (%) is the proportion of KIPO's revenue, excluding the transferred amount from general accounting from the total budget for tax expenditures.

Source: Specification for budget (KIPO 2007, re-quotation from p. 99)

With the introduction of the Patent Management Special Accounting plan from 1988 to 1997 KIPO conducted commission increases six times and commission adjustments three times in order to expand its budget to accommodate tax expenditures and to secure a flexible operation of the program. Finally, KIPO achieved 100% financial dependency in 1998 (See Table 3-6). With such secured financial flexibility, KIPO also made a great achievement in its IT system development with the KIPOnet E-application system (an office automation system that enables complete electronic management of IPR activities, such as on-line filing and patent information searches) (KIPO 2007). The institute laid the foundation for the proactive execution of projects for creation and utilization of IP rights, such as the invention promotion project and invention utilization business.

2011 Modularization of Korea's Development Experience
Korea's Intellectual Property Rights System and its
Application to the Phases of Industrial Development
: Focusing on the Patent System

Chapter 4

The Third Developmental Phase of Korea's IPR System: Advancement Period (late 1990s-Present)

1. Overview of the Advancement Period
2. Execution of Patent Institutions and Policies
3. Restructuring of Patent Administration and Infrastructure

The Third Developmental Phase of Korea's IPR System: Advancement Period (late 1990s-Present)

1. Overview of the Advancement Period

As already mentioned in Chapter 1, Korea's competency for technological innovation almost reached the level of the advanced countries in the late 1990s; big business reached the technological frontier. Along with such technological growth of Korea, the patenting activities show sound performance. As seen in <Table 4-1>, the number of domestic patents strikingly increased and thus the domestic share rose up from 67.3% in 1998 to 77.5% in 2010. Given the surge in the number of patents in Korea during this period, the IPR system revision was more focused on speeding up administrative procedures and improving the quality and efficiency of patent examination (KIPO, 2007; Lee&Kim, 2010). For example, KIPO introduced an online application system called KIPOnet in the 1998 Amendment, enabling for a shortened patent processing period for patent investigations (KIPO, 2007).

Table 4-1 | Trends of Major IPR Variables in Korea

	1981	1985	1990	1990	1994	1990	1995
Foreign Patents	24,592	24,672	29,566	34,865	40,713	43,518	38,296
Domestic Patents	50,595	72,831	76,570	105,250	125,476	127,114	131,805
Domestic Share [%]	67.3	71.4	72.1	75.1	75.5	74.5	77.5
Utility Model [A]	28,604	36,817	38,662	37,167	32,193	16,971	13,193
Invention Patents [B]	75,187	97,503	106,136	140,115	166,189	170,632	170,101
Ratio [A]/[B]	0.38	0.38	0.36	0.27	0.19	0.10	0.08

Source: Database of Korea Intellectual Property Office available at www.kipo.go.kr

In addition, KIPO started to concentrate more on publicizing the importance of gaining IPR to the people, establishing infrastructure such as an online access system, and helping the searching process by distributing patent map reports. Thus, the Korea Institute of Patent Information (KIPI) was established in 1995, followed by the introduction of an on-line patent data search system for researchers in 1996 and a free-of-charge service in 2000. In 2000, the patent-map for major technologies was developed and distributed, and in 2005 a patent analysis was conducted on major national R&D projects. In particular, the patent analysis included preemptive surveys on patents in the planning stage for national R&D projects, which satisfied criteria that became mandatory in 2005. In addition, in June 2011 the Intellectual Property Act (Article 10629) was enacted for comprehensive and efficient execution of national IP policies. Suffice it to say, the utilization of patent information has been better organized to produce more efficient, effective, and expedient IP operations.

As such, the major concerns in the development phase were the development of a high quality, efficient patent system and policy operations to encourage technological innovation and the creation of top-tier industrial technologies (Lee 2002). Therefore, Chapter 4 deals with the following: (i) Three-Track examination system, which was introduced to enhance the efficiency of the application process and (ii) the online application system introduced for promote efficiency of administrative procedures and patent examination; and the Korea Institute of Patent Information (KIPI), which were introduced to share IP information.

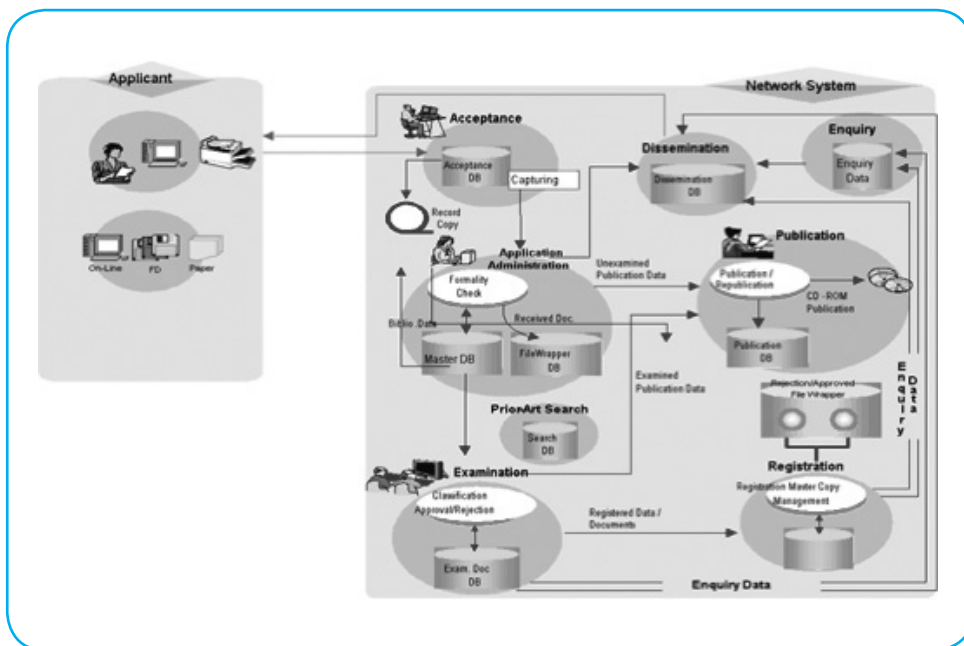
2. Execution of Patent Institutions and Policies

2.1 Efforts for Advanced Patent Administration: Introduction of the E-application System

As the 1990s unfolded, the emergence of a knowledge-based economy, together with a keen awareness of the importance of IP by domestic firms, led to a significant increase in the number of applications for IP rights. In line with such an increased rate of IP applications, the delayed IPR examination procedures emerged as a major issue in patent administration. In 1994 KIPO gave top priority to shortening the patent application examination time by developing the “Seventh Five-Year (Economic and Social Development) Revised Plan,” to include IT system development for IP administration. KIPO also entered into the IT system development stage for the E-application system¹⁸ in 1995 and finally opened the door to online applications by launching KIPOnet on Feb 2, 1999 (KIPO 2007).

¹⁸ KIPO registered copyrights for KIPOnet in Korean and English and secured the domain of kipo.net for expansion and exportation of the system. Ten years ago, KIPO pursued IT system export policies (See Appendix).

Figure 4-1 | Application Procedure Using KIPONet



Source: Lee et al. (2003, 98)

The KIPONet system consists of a total of 22 unit systems to computerize all patent administrative procedures, from filing, examination and registration, to publishing. A brief account of the working processes of the KIPONet system follows. As soon as an application is received (either online, on floppy disk, or on paper), the applicant is immediately notified of the application number. Applications in paper form are converted into SGML format (WIPO ST.32, the WIPO document standard). KIPO has set up a "Patent Data Conversion Center" for the rapid and efficient conversion of paper documents into SGML format. Applications received by KIPO are transferred to the Application Administration Server for a simple formality check of registration information, patent fees, and bibliographic data. The formality check automatically detects 100% of possible errors in the applications. Depending on the results of the automatic formality check, either applications are rejected, or the applicant is notified via a manual formality check of the defects to be corrected.

Unlike the Japan Patent Office (JPO) that first introduced the E-application type of system for the electronic submission¹⁹ of IP documents, the Korean KIPOnet is an Internet-based IP (for patents, utility models, designs and trademark rights) application e-filing system. The E-application system will be dealt with in detail in the next chapter. As illustrated in Figure 4-2 below, the KIPOnet system enables applicants to manage all patent administrative

¹⁹ The E-application system developed in December 1997 by Japan only allowed E-application for patents and utility models and used a dedicated line, rather than the Internet, and was not connected to a secure system.

procedures, including submitting, evaluating, registering, and publicizing IP. It also provides applicants with various search services, as well as copies of certain patent information, status announcements of application documents, and document transmission (submission and receipts), so as to maximize the work efficiency of KIPO in terms of patent administration.

Figure 4-2 | Changes in KIPO’s Services after Introduction of KIPONet

Before KIPONet		After KIPONet
Paper-based filing, referral, and transmittal		On-line filing application
Manual search		Customized services
Paper-based document management	⇒	Electronic document management
Paper-based approval		Electronic approval
Searching, issuing and posting		On-Line service
Typical statistic information		Various on-line analyses of statistics

Source: Lee 2003, 85

Since its launch in 1999, KIPONet has consistently expanded by implementing the following: establishing the E-Government²⁰ system in 2002, publishing an Internet-official magazine publication, and implementing both short-message service (SMS) and push e-mail (a system that provides e-mail delivery to a wireless device). In 1999, at the time the system was launched, only 36% of the public documents were utilizing the E-application type of method; however, constant software upgrades and online system improvements have resolved many system failures (See Table 4-2). As a result, by 2002, all procedures for IP administration through the IT system were addressed, while competing E-Government projects for the first time among government agencies (KIPO, 2007), and the rate of E-applications reached 92.2% in 2006. The IT system undoubtedly has substantially enhanced the work efficiency of the world’s IP administrative activities.

20 E-Government refers to a government agency that utilizes the Internet to realize a paperless work process system.

Table 4-2 | Increasing Trend of E-application (1999-2006)

Description	1999	2000	2001	2002	2003	2004	2005	2006
E-application rate (%)	74.0	79.4	81.4	83.6	86.5	89.0	90.8	92.2

Source: KIPO 2007, 65

Table 4-3 | International Comparison of E-application Rate (%)

Description	Korea (2006)	Japan (2005)	Europe (2005)	United States (FY 2005)
Patents	97.2	97	23.4	14.1
Utility Models	83.4		-	-
Designs	89.0	90	-	-

Source: Major Statistics for Intellectual Property (KIPO 2007, 2)

Table 4-4 | Accomplishment of KIPOnet (1999-2006)

Section	Section	1999	2000	2001	2002	2003	2004	2005	2006	Total
Internal Business OProcess portunity Cost Savings	Admi- nistration	21,160	18,631	24,521	25,381	26,770	30,854	39,264	51,672	238,253
	Exa- mination	11,495	10,656	9,728	13,947	16,942	19,294	21,387	25,712	129,161
	Total	32,655	29,287	334,249	39,328	43,712	50,148	60,651	77,384	367,414
Customer	E-filing	1,809	2,424	2,866	4,182	4,635	5,364	6,099	6,924	34,303
	Search	60,399	165,27	330,092	401,748	464,988	536,113	621,412	741,255	3,321,134
	Total	62,208	167,551	332,958	445,258	513,335	591,625	627,511	748,179	3,355,437
Grand Total		94,863	196,838	367,207	445,258	513,335	591,625	688,162	525,563	3,722,851
Promotion of Technology Development		Shortening of R&D period				26.18%				
		Reduction of R&D costs				27.5%				
Elevation of National Status		Leading role in international cooperation in IT								
		Elevation of national brand image								

Source: KIPO website from <http://www.kipo.go.kr>

With support from the KIPOnet IP administration IT system, the institute has played a leading role in transforming to “E-KIPO,” and as of end-2006 E-applications occupied 97.2% of all Korean patent cases. With a database of 145.5 million patent technologies at

home and abroad, the world-class patent administration IT system was developed and is operated by KIPO (KIPO 2007). In summary, KIPOnet, the world's first online E-application system, has laid the foundation for advanced patent administration, and is evaluated as one of world's best in terms of utilization (See Appendix 1).

The most remarkable benefit of KIPOnet has been the shift in Korea's work process; namely, the country has shifted from a paper-based paradigm to an electronic IP system. With a state-of-the-art IT infrastructure, Korea has become more IT oriented. By the end of 2009, the e-filing rate for IP applications in Korea reached 97.3%. For internal efficiency, Korea was able to enhance efficiency and transparency of its IP administration with computerized searches, renovated business processes, and improved convenience to staff with the Work-at-Home System. As a result between 1999 and 2006 customers and the government saved a total of USD 2,897 million. Since the system has been fully implemented in January 1999, the economic benefits have almost doubled each year. Besides direct economic benefits, industry receives advantages from the KIPOnet system in other ways: It has shortened the average R&D period by 26.18% and has lowered the average R&D costs by 27.59%.

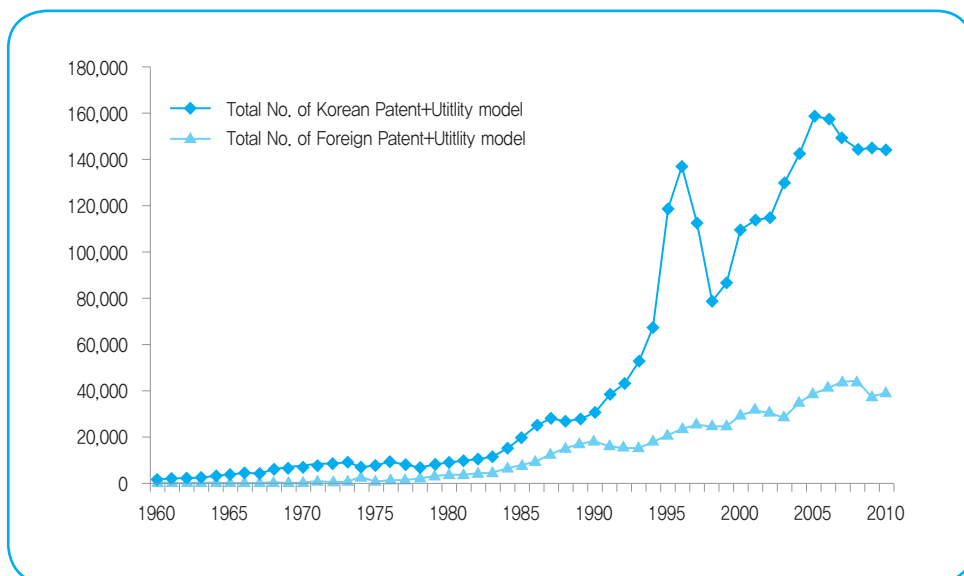
2.2 Efforts to Enhance Efficiency of the Examination System: The Three-Track Examination System

As the rapid development of industrial technologies and the advancement of a knowledge-based society have heightened the economic value of IP, the international competition for IP has intensified. To respond to the rapidly changing international IP environment, granting a patent-giving the patentee the sole right to make, use, and/or sell its technology/invention in an allotted time period-is of utmost importance. In order for the patent holder to receive a sound return (whether monetary or otherwise) on his/her investment, together with the finiteness of the amount of time allotted to exercise the patent option, the timeliness with which patents are able to pass through the entire IP system is also of great significance. The operation of the IP examination system is one facet of the entire IP system where gains can be made if it is run expeditiously and efficaciously.

As reflected in [Figure 4-3] above, the applications for patents and utility models have skyrocketed in the 21st century, enthusiastically driven by an increased awareness and keen interest in IP opportunities following the international activities of domestic firms in the 1970s. KIPO had earlier adopted a policy that emphasized speed of patent examination, and in 2006 and 2007 the office succeeded in reducing the period of examination that led to the issuance of the first office action (i.e., the first examination of patentability) to a world-record time of 9.8 months.

However, a large increase in the number of applications being filed as well as increasing concerns about the quality of the speedy examination results led KIPO to rethink its policy 173 and on October 1, 2008, it introduced the first-ever three-track, "customer-tailored" examination system.

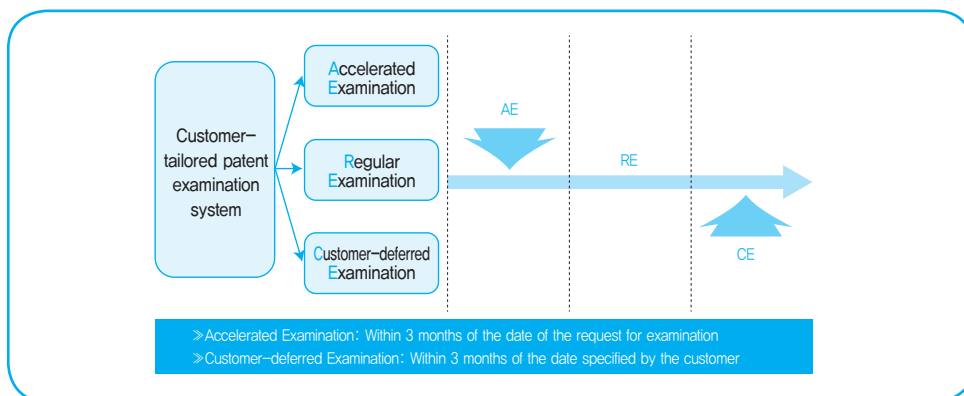
Figure 4-3 | Number of Patent and Utility Model Applications by Local Residents and Foreigners in Korea (1960-2010)



Source: KIPO statistics

Under this system, applicants are no longer obliged to accept a uniform examination period; depending on their IP strategy, they can choose one of the following three examination tracks: accelerated, regular, or customer-deferred. For example, applicants who wish to acquire an IP right as soon as possible to secure an exclusive position in the market place can do so by applying for an “accelerated” examination. For applicants who need more time due to commercialization, market-related or finance issues, or other examination delay-related reasons, can apply for a “customer-deferred” examination. Current examinations take an average of 16 months, so anyone utilizing the fast examination (via the expanded preferential examination) method will usually have their IP examined within two to three months. For customer-deferred examinations, applicants can request when they want their applications examined, and the examinations are conducted within three months of the requested date. Efficient use of the customer-deferred track can prevent the invention from being disclosed too early due to early patent decisions. It can also reduce the cost of maintaining a patent.

Figure 4-4 | Track Examination System (Customer-tailored Patent Examination System)



Source: KIPO web site

The origin of the three-month patent examination system was the priority examination in 1980, which was introduced with the revision of the law (Article 80.4) to enhance procedural efficiency and accelerate the examination speed for patents by giving priority to those applications that satisfied the criteria.

The eligible objects for priority examination are defined by the executive order, such as applications for the national defense industry for national industrial policies, energy savings and the alternative energy industry, export promotion, pollution prevention, and public-interest-oriented inventions of the central local governments and their research centers (Jung Chaho 2004). The eligible cases have expanded to cover most of the applications, in accordance with current regulations.

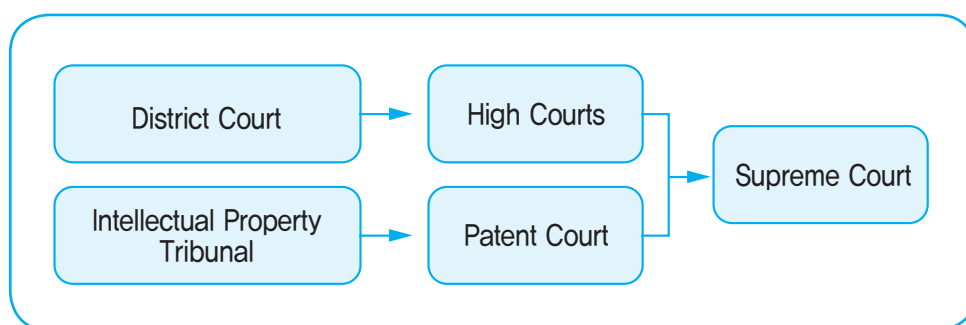
The priority examination system evolved into the customized Three-Track patent examination system. In 2009, 2,690 cases (2.9% of the total 132,493 cases) were priority examination cases, and 1,691 cases (1.3%) were for grace-period examination. In May 2009, the customer satisfaction survey showed 77.4% of users were satisfied with the expedited system. As indicated, the customized Three-Track system was stabilized within a year of its introduction and was of such high quality in the protection of rights and interests of the applicants that the United States introduced Korea's customized Three-Track patent examination method into its own system (See Appendix 2).

3. Restructuring of Patent Administration and Infrastructure

3.1 Efforts to Improve IPR Trial System: Establishment of the Patent Court

The current patent judiciary system was adopted as part of the Reform on Civil Judicial System in the early 1990s. Before the reform, the only judicial review before the court on patent cases was made by the Supreme Court after appeals to administrative tribunals at Korean Intellectual Property Office. Today the Intellectual Property Tribunal (IPT) only handles single-step trials while the Patent Court is in charge of reviewing appeals to decisions rendered by the IPT first hand. The Supreme Court takes over from there to review those appeals again. The Patent Court has an exclusive jurisdiction over all appeals from the IPT, which handles cases on validity of a patent, utility model, industrial design and trademark. However, the Patent Court does not review appeals from district courts decisions on infringement issues. Appeals on infringement cases go to high courts which have jurisdiction on general civil cases. Therefore, there are two different tracks which patent cases go through in Korea.

Figure 4-5 | Current Patent Judiciary System



Source: Chung(2005), p.120

The significance of the Patent Court's decisions is that the Patent Court reviews appeals for IPT's decisions on trials to confirm the scope of an intellectual property right. Key issues in intellectual property disputes often turn to the validity of intellectual property rights and the Patent Court plays a pivotal role in resolving intellectual property disputes.

Because the Patent Court does not decide on infringement issues, there is a need for another reform of the patent judiciary system. Many intellectual property practitioners believe that the jurisdiction of the appellate level on intellectual property infringement cases should be concentrated at the Patent Court in order to improve consistency and efficiency in

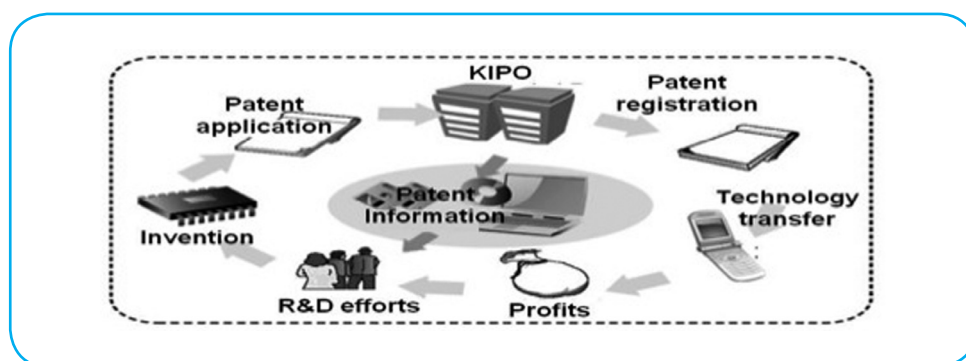
the resolution of intellectual property disputes. Another argument is that the judges sitting at general civil courts do not possess a sufficient level of technical specialty required to handle complicated patents.

3.2 Efforts to Vitalize Technological Information for Patents: Establishment of KIPI

To encourage inventions and IP creation, the indirect social infrastructure opportunities and services provided to creators, such as the ability to quickly access and utilize scientific and technological information included in IP, is invaluable. With such support, inventors are able to avoid patent redundancies and appreciate technological trends, enabling them to more efficiently create and utilize the IP. Therefore, technological IP information should not only be accessible to the nation and industries, but the general public should also have access to these benefits. Moreover, the increasing importance of IP, together with its strengthening of activities for technological innovation since the mid 1980s, has resulted in a significant increase in applications for IP and a great demand for IP technological information. The need for the establishment of an IP institution that coordinates IP activities and revitalizes the circulation and utilization of IP technological information at the national level has become acute.

In the early 1990s, however, there was only the KINITU, under the authority of the Korea Institute for Industrial Economics&Trade (KIET). The Invention Promotion Institute provided services of collecting simple patent information using the Pigeon Hole System, the manual patent data search engine of the KIPO (See Appendix 3, KIPO 2007, 639). KIPO benchmarked the IPI (JAPIO) and EPO (European Patent Office) EPIDOS (EPO's sub-office based in Vienna, Austria) to establish the "Patent Information Center," which since 1994 has developed online services for the private sector and developed the E-application system (KIPO, 2007).

Figure 4-6 | Virtuous Circle of R&D and Patent Information Utilization



Source: KIPO (2007, 174)

In the course of developing the Patent Information Technology Center, the budget examination session was held to secure budgets. However, it was difficult because of concerns over redundancies with other national research centers that had already been established. Proactive efforts by KIPO public officials secured them a budget of approximately 1 billion KRW for an online service plan for public patent information from the high-speed information and communication network project under the authority of the Ministry of Information and Communication. In the following year, the institute successfully secured a budget of two billion KRW to purchase IT equipment after several persuasive requests were made to the budget department of the Economic Planning Board.

These efforts helped to establish in July 1995 the Technological Information for Patent Center (now the Korea Institute of Patent Information [KIPI]); in 1996, the Korea Intellectual Property Rights Information Service (KIPRIS) for online IP search information; and the Patent Map Service in 1999, to efficiently provide patent information services.

As indicated in [Figure 4-6] above, the establishment of the Korea Institute of Patent Information (KIPI) has laid the foundation for technological development and international industrial competency by enabling industries, research centers, academia, and patent attorneys to obtain relevant information on patents at home and abroad (Choi Taechang, Kim Wonjun interview). Even though the scale of patent information was minimal upon its establishment in July, 1995, the Technological Information for Patent Center, which was later renamed the Korea Institute of Patent Information (KIPI), has since developed into a top-notch, quality patent-searching function with 500 specialists. It is the driving force behind the significant quantitative growth in patent rights (See Appendix 3).

KIPI, an affiliated public institute of KIPO, was founded in July 1995 to strengthen national industrial competitiveness and contribute to technological development by providing people (in industries; institutes and academia; and specialists, such as patent attorneys) with domestic and foreign information relevant to IPR. KIPI provides a specialized IPR information service and links up with KIPO for constructing a national intra-network system of IPR-related information. It performs a guiding role in creating superior inventions and developing up-to-the-minute technology in the ROK. The major activities of KIPI are as follows:

- Collection, processing and reproduction of domestic and foreign patent information;
- Database construction and free online service for domestic and foreign patent information;
- Prior art search and analysis service;
- Supply and distribution of patent information;
- Screening and planning work relevant to patent information;
- Cooperation with domestic and foreign patent information organizations;
- Teaching and advertising of patent information management.

Table 4-5 | Scope of Information Available through KIPI Service

Kinds	Contents	Forms of Compilation	Basic Date	Data Coverage
Patent/ Utility Model	Bibliography of Unexamined Publication	Text	Publication date	1983 to date
	Bibliography of Granted Publication	Text	Publication date	1948 to date
	Abstract	Text	Gazette date	1948 to date
	Specification	Image/SGML	Gazette date	1948 to date
Trademark	Character/figure	Text/Image	Formality examination date	1950 to date
Industrial Design	Registration	Text	Registration date	1948 to date
	Design gazette	Image/SGML	Registration date	1948 to date
	Publication in advance	Text	Publication date	1996 to date
Registration of Four Rights	Registration	Text	Registration date	1948 to date
Four Rights	Legal status		Filing date	1947 to date
Decision	1 st 3 rd		Request date	1957 to date
Foreign patents	USPTO, JPO, EPO		Links of Search site of each patent office	-

Source: WIPO (2003)

2011 Modularization of Korea's Development Experience
Korea's Intellectual Property Rights System and its
Application to the Phases of Industrial Development
: Focusing on the Patent System

Chapter 5

Evaluation and Implications

1. Three Keys to Korea's Success
2. Discussion on Limitations
3. Closing Remarks

Evaluation and Implications

Since its inception, Korea's IPR system has undergone three developmental phases: (i) the Introduction Period (1900s-1970s), (ii) the Settlement Period (1980s-late 1990s), and (iii) the Advancement Period (late 1990s-present). It is said that Korea has successfully modernized and developed the IPR system and effectively responded to changing circumstances. Now, Korea is recognized to have a well-functioning IPR system that fosters technological development and economic growth (KIPO&WIPO, 2003; Lee&Kim, 2010).

The question arises as to whether Korea's success is transferable to other countries. Certainly, experiences of Korea are unique to Korea, and countries wishing to benchmark the success of Korea are neither able to nor need to emulate the exact steps taken by Korea. In fact, scholars have noted that an IPR system's effectiveness for industrial development depends on a country's unique characteristics that contribute to or detract from the country's success (Fink and Maskus, 2005; Maskus, 2000). However, points to be taken from Korea's experience are not its IPR system itself but rather the process in which the IPR system has developed responding to external circumstances.

Table 5-1 | Best Practices

Periods		Best Practice
1	Introduction (1900s-1970s)	<ul style="list-style-type: none"> · Adoption of Utility Model System (1961) · Adoption of Employee Invention Compensation System (1977) · Establishment of Korea Intellectual Property Office (1977)
2	Establishment (1980s-late 1990s)	<ul style="list-style-type: none"> · Joining to International IP Communities · Establishment of International Intellectual Property Training Institute (1987) · Establishment of Patent Management Special Accounting (1988)
3	Advancement (late 1990s-present)	<ul style="list-style-type: none"> · Establishment of E-application System called KIPOnet (1998) · Adoption of Korea Institute of Patent Information (1996) · Adoption of 3-Track Examination System (2008)

Admittedly, every IPR system is supposed to undergo the developmental stages of “Introduction”-“Establishment”-“Advancement” although specific events characterizing certain stages or the time length for a certain stage may vary across countries. The contribution of this paper is to present in what context certain features in Korea’s IPR system have been made. Beyond simply presenting a chronological list of changes in Korea’s IPR system, this paper presents representative features of the Korea’s IPR system within the context which caused the features to occur. This can help discern whether such features are applicable to a specific country for that specific situation. In Korea’s case, the following factors particularly contributed to the successful completion of one stage and transition to the next stage. Countries should take into consideration the context in which the best practice was applied. The features presented as best practices in <Table 5-1> below are explained in detail in Chapters 2 to 4.

1. Three Keys to Korea’s Success

In addition to presenting the individual best practices (see Table 5-1) we have identified three key factors that characterized the development of Korea’s IPR system. To the extent the keys presented below contributed to Korea’s successful operation of its IPR system, developing countries may also apply these keys to increase their likelihood of success.

1.1 Efforts for Promoting IPRs Activities

The most urgent task for developing countries with low levels of IP awareness and the capacity to create IPRs would be to increase a quantitative volume of patent applications. As it was in Korea’s case, at the earlier stage of the introduction of the IPR system in developing countries, the level of technology is substantially lower than that of advanced countries. Due

to the low level of indigenous technological capacity, people in developing countries will not be able to easily develop their own technology protectable under patent, which requires a high level of inventiveness. Thus, it is first necessary to reinforce people's awareness and encourage IPR-generating activities through the introduction of the utility model system, which awards IP rights to inventors of small inventions that do not qualify for patent rights.

In this context, the introduction of the utility model system in Korea should be recognized.²¹ In Korea's experience, the utility model system is considered fairly effective in that it encouraged indigenous inventive activities by protecting domestic small inventions and also cultivated an IPR culture among people by letting them have their own inventions protected and understand the value of having IP ownership. Since the utility model demands a lower level of inventiveness, the utility model system allows protection of "lower level invention" that do not reach the level for a patent. In fact, other countries such as China and Malaysia have enacted an active utilization of the utility model system in their earlier phases of development (Kim et al., 2011).²²

For developing countries considering adopting the utility model system, Korea's model would not be the only alternative to follow, although the Korean government's efforts to educate the public of its system are noteworthy. The subject matters protected under Korea's utility model system were limited to "shape," "feature," "structure," and "their combination," thus excluding innovations in computer programs, process, chemical treatment, and chemical substance. To protect small-scale innovations or small inventions in those areas, other countries may consider providing a more extensive utility model system.

The adoption of "Employee Invention Compensation System" is another effort by the Korean government to promote IPR activities. As explained earlier in 2.2, this system recognizes ownership of employers on the IPRs from their employees' inventions while providing the employees with compensation for their inventions in return. Being assured that they would own successful inventions created in the workplace, firms were encouraged to invest in R&D and IPR-generating activities. The role of the Korean government was huge in the settlement of "Employee Invention Compensation System". It implemented promotional activities including holding seminars and publishing guidelines, dissipating the system into industry and establishing an invention-oriented atmosphere across the nation.

For a country with a short IPR system history, most firms would be left not appreciating the needs for IPRs. If the country is at an earlier stage of industrial development, little technological outputs would be expected from the domestic firms. In such situations, the Employee Invention Compensation System would provide the firms with incentives to invest in R&D and IPR-generating activities. To promote much more active use of the

21 Not all countries that provide patent rights protect utility models, such as the U.S. and U.K. The few developed countries that protect utility models include Germany, Japan, and some European countries. Countries that protect them are largely developing economies (former or current), such as Korea, Taiwan, China, and Malaysia (Lee&Kim, 2011).

22 In the case of China, the utility models accounted for nearly two-thirds of the total intellectual property rights granted during 1985-1998 (Kim et al., 2011).

Employee Invention Compensation system, a country would have to educate the public on its benefits. As with the case of Korea, the awareness of this system could be improved by seminars or guidelines.

1.2 Active Leadership of Governmental Office in Charge of IPR

The Korean Intellectual Property Office (KIPO), a governmental office for IPR, has been integral to Korea's successful growth. Although created in 1949, KIPO was reestablished as an external administration of the Ministry of Commerce and Industry in 1977. Since the reestablishment of KIPO as an independent IP office, Korea's IPR system for technological/industrial development has been effectively modernized with the help of the comprehensive role of KIPO. For example, KIPO itself could push forward "the modernization plan" for advancing the IPR administration in a more effective way. By getting funding from UNDP in 1978, KIPO could successfully accomplish the modernization plan from the period of 1980-1986, and thus establish the advanced IPR administration.²³

It is noted that KIPO's role in facilitating the use of the IPR system to promote development far exceeds that of other intellectual property offices. While most patent offices see their functions limited largely to patent examination, patent promotion, administration of the patent laws, such as the United States Patent and Trademark Office (USPTO), KIPO sees its functions as supporting technological development through direct interaction with the private sector (e.g. firms, individual inventors).²⁴ For instance, KIPO has provided a wide range of IP-related support programs such as invention promotion projects, technology information dissemination projects to the private sectors (KIPO, 2007).

Successful implementation of numerous IP policies (or projects) by KIPO could be attributable to KIPO's special accounting plan, which allows KIPO to operate on independent revenues from IPRs application fees. With the Patent Management Special Accounting program initiated in 1987, KIPO obtained its budget independency. KIPO was able to significantly expand its budget and secure its operational flexibility without being limited to the cap set by the National Budget Plan.²⁵ With KIPO's budget independency, Korea was better able to effectively operate IP policies to support and protect domestic industries. Korea's IP policies set priorities on the weak industrial sectors.²⁶ It is recommended that IP

23 As you can see on page 40, the main objectives of the modernization plan were to: redesign the IPR rules, improve the quality of the IP examiners and IP judges, secure patent information materials, establish the management system, develop/modernize the computer system, and enhance the effectiveness of patent administration through reform of the administrative organization.

24 Interview with Seungchul Jeon, Secretary of Korea Intellectual Property Office (September 9, 2011). Tel.: +82 042 481 5181. E-mail address: scjeon@kipo.go.kr

25 As you can see on page 55, KIPO achieved 100% financial dependency in 1998.

26 After concluding the agreement on the introduction of the substance patents, the Korean government put forward great efforts to persuade interested parties based on the rational outcome of commissioned research and the Ministry of Public Health and Society and the Ministry of Agriculture supported incentives to firms which introduced the relevant technologies and executed supportive policies to facilitate substance patent development [see Appendix 2].

offices in developing countries consider establishing their IP office's independent budget so that the IP office has a stable budgetary ground to pursue efficient IP policies for industrial and technological development and to make proactive, timely responses to the changes in international IP environments.

It is noted that KIPO could establish three sub-organizations of KIPO thanks to the independent budget system: the International Intellectual Property Training Institute (IIPTI), the Korean Invention Promotion Association (KIPA), and the Korean Institute of Patent Information (KIPI) (see Appendix 3). These three affiliates are key capacity builders for indigenous innovations as they formed highly effective partnerships with and intersect with the private sector in all aspects of IPR activities, from R&D to commercialization of technology, and to enforcement of IPRs. In other countries too, an independent budget system of the IP office would allow the office to pursue IP policies in a timely and effective manner, although such an independent budget system may be unlikely before the office has sufficient applications filed at its office.

1.3 Effective Management of IPR Procedures

To further facilitate the activities of creation, commercialization, utilization, and protection of IPRs, Korea's E-application system called 'KIPOnet' can be recommended. KIPOnet is an office automation system that enables complete electronic management of IPR procedures such as patent applications, registration, and examination. It provides applicants with a breadth of electronic services such as on-line filing and patent information searches. In Korea, the KIPOnet system successfully increased KIPO's efficiency in patent administration without necessitating the transfer of paper. Recently, the customized systems of KIPOnet have been developed and provided to developing countries in line with their IT competency. The introduction of such a program in developing countries would enhance the efficiency of patent administration as well as IPR-generating activities (See Appendix 2).

Along with the introduction of the E-application system, the Three-Track examination system is recommended as the IPR examination system for developing countries. Under this system applicants are no longer obliged to accept a uniform examination period; depending on their IP strategy, they can choose one of the following three examination tracks: accelerated, regular, or customer-deferred. The system has been so highly appreciated; for example, the United States uses it for the protection of applicants' rights (See Appendix 2).

Introducing legislation to implement these types of IPR examination systems is strongly recommended once a country's application numbers reach a certain level and need to serve various application strategies. As the level of national IPR activities increases, the larger number of applications filed is likely to cause a delay in patent examination. Patent examination needs to be customized to serve the applicants who want to secure patents as soon as possible and enter the market fast. The accelerated track of the Three-Track examination system would meet such needs of the applicants, while the regular or customer-

deferred tracks serve other applicants who want to take their time to observe how markets develop.

2. Discussion on Limitations

2.1 Quantitative Growth Rather Than Qualitative Growth

It is appropriate to say that Korea has reached a world-class level in IP creation in terms of quantity, e.g., the numbers of patent applications or patents registered. The following statistics illustrate how quickly and drastically patent activities by Koreans have increased: as to the number of patents held by Koreans in the United States Patent&Trademark Office (USPTO), it dramatically increased from only 30 in 1984 to 6,295 in 2010. When it comes to the number of international patents (PCT) applications by Koreans it has also strikingly increased from only 10 international patents (PCT) filed in 1984 to 9,686 PCT applications in 2010. It is the opinion of IP experts in Korea that this growth is attributable to the Korean government's policy which emphasized the generation of IPRs and promoted it among the public as one of the core goals for technological/industrial development of Korea.²⁷

Despite the surge in Korean patenting activities, assessment on Korea's innovation capacity is not entirely positive. Referring to Technology Balance of Payment (TBP)²⁸, Korea has experienced chronic loss of TBP in an absolute amount (see Table 5-2). The values of Korea's TBP have only shown some incremental improvement from 0.05 in 1996 to 0.43 in 2007 (see Table 5-2).²⁹ It seems that Korea still has a high dependency on technology from abroad and has yet to achieve capabilities sufficient to developing key technologies.³⁰ Its apparent growth (i.e., huge volume of patent applications and patents registered every year) may be in essence a quantitative one rather than a qualitative one.

27 Interview with Chaho Jeong, Professor of Sungkyunkwan University, Republic of Korea. E-mail address: chaho@skku.edu

28 The OECD definition for TBP is the money paid or received for the use of patents, licenses, trademarks, designs, inventions, know-how and closely related technical services. It reflects the total volume of technology trade, the technology balance of payments reflects a country's ability to sell its technology.

29 The incremental improvement of the rate of TBP shows Korea's gradual enhancement of technological capacity (Jeong, 2004).

30 TBP reflects a country's ability to sell its technology abroad and its use of foreign technologies (OECD, STI scoreboard 2001).

Table 5-2 | Trade Balance of Payment of Korea

(Unit: USD \$million, %)

	1996	1997	1998	1999	2000	2001	2002
Technological Export(A)	108.5	162.9	140.9	193.3	201	619.1	638.1
Technological Introduction Expense(B)	2,297	2,414	2,386	2,685	3,062	2,642	2,721
Technology Trade Balance(A-B)	-2,188	-2,251	-2,245	-2,492	-2,861	-2,023	-2,083
Technology Trade Volume(A+B)	2,405	2,577	2,527	2,879	3,263	3,261	3,359
TBP Rate(A/B)	0.05	0.07	0.06	0.07	0.07	0.23	0.23
	2003	2004	2005	2006	2007	2008	2009
Technological Export(A)	816.2	1,416.4	1,624	1,897	2,178	2,530	3,582
Technological Introduction Expense(B)	3,236	4,147	4,524	4,838	5,103	5,670	8,438
Technology Trade Balance(A-B)	-2,420	-2,731	-2,900	-2,940	-2,925	-3,140	-4,856
Technology Trade Volume(A+B)	4,052	5,563	6,150	6,734	7,282	8,200	12,020
TBP Rate(A/B)	0.25	0.34	0.36	0.39	0.43	0.45	0.42

Source: Ministry of Science and Technology and Technology Trade Statistics Survey (annual)

In fact, IP experts in Korea accept that the focus of patent policies by the Korean government throughout the three developmental phases has mainly been on encouraging people to generate patents, rather than encouraging them to generate “high-quality” patents (Appendix 1). A shift from quantitative growth toward high-quality patents is thus necessary for Korea. However, it is to be noted that the quantitative growth was not in vain. High-quality patents are likely only on a wide range of patents including the ones with poor quality; quantitative growth is a prerequisite for quality improvement (Appendix 1). As such, developing countries are advised to begin with policies aiming to expand application numbers first.

2.2 Protection Scope of Patents: Introduction of Substance Patent

In 1987, Korea revised its Patent Act to protect product patent under law. The adoption of product patent was a topic of heated debate for years because it was viewed that the Korean government accepted all the demands of the US government without a thorough

investigation of the introduction of the substance patent system in Korea (see Appendix 2). The adoption of the substance patent was certainly due to strong pressure from the US and it is understandable that Korea ultimately adopted it in the process of negotiations with the US. Nonetheless, one may point out that the details of the agreement, may have been different and in favor of Korea if the circumstances were different.

Korea's experience shows that countries need to be cautious in adopting the substance patent system and, if it is decided that it will be adopted then detailed measures to support domestic industry need to be taken. Korea's case evidences that the introduction of substance patents for Korea has resulted in the consistent expansion of market share by foreigners.³¹ This would also be the case with developing countries; developing countries with a limited level of technological capabilities in pharmaceutical and chemical industries would have to import foreign medicine and agricultural chemicals at a high price, or pay sizable royalties after adopting the substance patent system.

Therefore, it is recommended that developing countries in the early stages of IPR development seriously consider delaying the introduction of substance patents (See Appendix 2). As for developing countries that would like to introduce the substance patent system in the early stages, it is recommended that after implementing interim measures of WTO/TRIPS they develop protective measures such as relying on their traditional medicine and not allowing foreign patents on these medicinal products so as to protect their pharmaceutical industry (Ibid). In addition, with regard to the supply of medicine for public health, it is recommended that an affordable-price provision become mandatory (See Appendix 2). When a nation has only a few pharmaceutical firms, it should restructure its patent protection enhancements to a level that satisfies the regulations of WTO/TRIPS and delay, to the greatest extent possible, the introduction of substance patents (See Appendix 2).

2.3 Patent Examination

Because the core of patent administration lies in the work related to patent examinations by examiners and administrative judges³², the quality of patent administration depends, to a very large degree, on the level of expertise of the examiners and the administrative judges (KIPO 2007). Despite the importance of their expertise in IP, evidence suggests that they lacked sufficient experience. Among the 44 administrative appellate judges appointed to the Appellate Trial Board³³ during the period 1988-1997, 28 judges (63.7%) had less than two years of experience including 20 judges (45.5%) who had no experience at all (see Table 5-3).

31 As described in 51-52, the market share of foreign companies has been dramatically increased from 8% in 1999 to 27.3% in 2005.

32 Trial judges are administrative judges who work for Korean Intellectual Property Office (For more details, see footnote 32 and 4.3.1).

33 Although there trial judges still exist, there are no longer appellate trial judges. Before 1998, the patent invalidation cases went through two administrative tribunals before the Supreme Court's final review (see 4.3.1). Appellate trial judges refer to administrative judges who worked for Appellate Trial Board, the jurisdiction of second instance for invalidation cases. After the Patent Court was established in 1998 as part of the Reform on Civil Judicial System, the former Trial Board and Appellate Trial Board were amalgamated to create the Intellectual Property Tribunal (IPT).

Table 5-3 | Experiences of Examiners and Judges prior to their Appointment as Appellate Administrative Judges

(Unit: Person, %)

Years of Experience	No Experience	Under 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	Over 5 Years	Total
Number of Judges (percentage)	20 (45.5)	4 (9.1)	4 (9.1)	3 (6.8)	3 (6.8)	3 (6.8)	7 (15.9)	44 (100)

Note: 1. People who were appointed as appellate judges from 1988-1997 (excluding those before 1988).

2. People who were appointed more than 2 times from 1988-1997 are counted once.

3. In the case of examiners' careers, experience as an examination manager is not included.

Source: KIPO (2007, 236)

Such appointments of the administrative judges show that decisions on human resources were made without consideration of judges' IP expertise. As seen in Table 5-4, the judges' lack of expertise led to their poor performance in judging cases, resulting in a high reversal rate of 42% in 1997 at the Supreme Court level.

Table 5-4 | Reversal Rate for the Appellate Administrative Judges' Decision at the Supreme Court

(Unit: Case, %)

Years	1990	1991	1992	1993	1994	1995	1996	1997	1998
No. of Reversed Decisions/ No. of Total Decisions (percentage)	11/40 (27.5)	9/40 (22.5)	9/29 (31.0)	8/29 (27.6)	9/23 (39.1)	7/21 (33.3)	15/36 (41.7)	16/38 (42.1)	9/40 (22.5)
Years	1999	2000	2001	2002	2003	2004	2005	2006	
No. of Reversed Decisions/ No. of Total Decisions (percentage)	4/15 (26.7)	8/46 (17.4)	14/98 (14.4)	18/99 (18.2)	14/85 (16.5)	20/88 (22.7)	16/50 (32.0)	9/172 (5.2)	

Source: KIPO (2007, 237)

From Korea's experience, it can be learned that developing countries need to have well-established secure qualified examiners/administrative judges with sufficient experiences. A perfunctory appointment of examiners or judges would cause not only low quality patents being issued, but also poor performance in patent administration. To have qualified human resources with IP expertise, countries may consider educating people by offering continuous trainings provided at WIPO and other institutions in advanced countries. Korea also had their government officials trained to improve their IP expertise at United States (USPTO) and Europe (EPO), to specifically prepare them for the introduction of Substance Patent (See Appendix 2).³⁴

Another issue is the deterioration in examination quality due to heavy workloads. The great increase of patent applications in the 1990s lengthened the patent examination period to as long as 37 months, causing a negative impact on firms' plans for introducing products into the market (KIPO 2007). To resolve the delay issue, KIPO placed a great deal of pressure on examiners to reduce the examination period, and the measure of "Best 10" was introduced. Since the measure provided promotional priority to examiners who handled a higher volume of examinations, some examiners undertook excessively heavy workloads, 6.5 times higher than the average, for example. This resulted in the deterioration of quality of patent examinations (KIPO 2007, Appendix 2).

Developing countries should have in mind that the quality in patent examination can be adversely affected by the effort to shorten the time spent for examination. Both the fast granting of patents and high-quality patent examinations would be both among the top priorities of any patent office. Korea's case shows that it is hard for patent offices to strike a balance between the two competing priorities, and they may make a mistake of pursuing one priority at the expense of the other.

3. Closing Remarks

In this paper, we showed changing aspects of the IPR system in Korea in the context of Korea's development. Unlike other previous studies aimed at evidencing the role of the IPR system for a country's industrial or economic development, this paper explored the developmental stages of the IPR system in Korea as they actually happened. Instead of providing a generalized or macro-level observation of the role of the IPR system for a country's industrial or economic development, this paper rather presents explanations for individual events, i.e., changes in laws or introduction of new measures. The contribution of this paper is that one can understand through this paper: what challenges Korea faced in operating the IPR system; which decisions or efforts governmental officers made in response to the challenges; and which effects were brought by the measures, laws, or policies taken.

³⁴ With support from WIPO, KIPO dispatched examiners to the U.S. and European countries to develop examination guidelines and to get examination training for substance patent. As a result, examiners could improve their IP expertise (see Appendix 2).

Admittedly, this paper covers Korea's experience only, and the explanations in this paper for events occurred in Korea may not be directly applicable to other countries. Nonetheless, any developmental process of an IPR system among different countries would be necessarily similar because an IPR system is introduced, then settled, and finally advanced to a form as desired by the country. Moving through the process, the country will have to educate its people to know the IPR system and encourage them to use it, and will have to handle problems of delayed patent examinations, as Korea did. The three developmental phases of Korea's IPR System, as proposed in this paper, would help developing countries refer to Korea's case by guiding them through the levels of development in their IPR System.

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Appendix 1 Consultation Opinion 1 (July 22, 2011)



Jung Chaho (chaho@skku.edu)

- [Present] Prof. in the Department of Law, Sungkyunkwan University (intellectual properties law)
- 1999: Ph.D. from School of Law, University of New Hampshire
- 1992-2004: section-chief-grade official for KIPO examination, international cooperation and law
- 1990-1992: 5th grade official in the Ministry of the Industry and Resources(regulation on advanced technology trade)

1. Measures for institutional restructuring of intellectual properties (experience for consulting)

※ Expert's opinion on the cases of success and failure in overcoming issues like objections from interest parties in the course of execution of intellectual properties in Korea

(1) Scope expansion for patent protection

Q.1 (Execution of substance patent) the introduction of product patent has raised major concerns on the negative effects on the chemical and medicine industries in Korea. How about the objections from the interested parties and how was opinion adjustment done?

- Still the pharmaceutical industry is opposing to strengthening of patent rights while at that time, the opposition was fiercer. Despite the opposition, Korea had to introduce the patent due to the pressure from the U.S. and arbitration was not reasonable. As for the 'Patent Linkage' which is introduced from the Korea-US FTA, the pharmaceutical industry opposed as well.

Q.1-1 What kind of issues would developing countries, which have weak institutions for intellectual properties, face with the introduction of substance patent? (in the cultural, social and political aspect)

- Despite the strong opposition from the pharmaceutical industry, the concerned situation was not realized after the introduction of substance patent. Based on

the case of Korea, other developing countries are likely not to suffer from special issues, provided that distinctive conditions of each nation should be considered. As an example, it is better to consider seriously whether the introduction should be delayed as much as possible for a country with few pharmaceutical firms.

Q.2 (Economic impact of the substance patent system) As a result, the introduction of substance patent (1987) facilitated the technological innovation of the chemical and pharmaceutical industries.

In line with the execution of TRIPs, developing countries should introduce the system in phase-in manner. Please, elaborate the consulting measures for the developing countries based on the experience of Korea.

- Since most of domestic pharmaceutical firms never dreamed of competing with international pharmaceutical firms, they would oppose any institutions to strengthen patent rights. If it is possible to make the enhancement of R&D efforts of some firms triggered by the introduction, the introduction should be made to facilitate R&D efforts of the firms. It means that a policy should be made for the better future of a few firms with potential rather than being swayed by the majorities without any willingness and potential.

Q.3 (BM patent) After the introduction of substance patent, BM(Business Model) patent was introduced in 1998. Please, elaborate some issues of the introduction and development stage as of now as well as its impact on technological innovation activities in Korea. After the introduction of substance patent, BM(Business Model) patent was introduced in 1998. Please, elaborate some issues of the introduction and development stage as of now as well as its impact on technological innovation activities in Korea.

- I believe that allowing patent for sales methods enhances the flexibility of relevant industries. However, the legal changes out of sudden have made a negative ripple effect of confusion of the relevant industries like financial and bank industries. It seems that the legalization of sales methods with patent is not active in Korea so that it can be seen as the beginning stage.
- However, the patent for sale methods have provided opportunities for the financial industry to get accustomed to protecting their new ideas with patents and get a new locomotive for creation of new ideas. In this vein, it has had positive impacts.

Q.4 Are there any other institutions besides product and BM patents to expand protection scope? (If there is, please elaborate on the institutions)

- There was in-depth review on measures to provide patents for medical method invention. Of course, still majority opinion is that it is not appropriate to give patents on the activities of doctors which are related to human lives. But I believe we should give patents on medical method invention in the future to enhance the probability of life saving through the development of relevant technologies.

(2) Strengthening of patent protection and restrictions on right abuse

Q.1 (Enhancement of rights for patent holders) There was intention to limit the rights of foreign patent holders before 1980; but since then, there have some attempts to recover the rights of patent holders. What are the background reasons of such changes in Korea from the perspective of the economy, politics and culture?

- I do not believe that a policy was established based on the philosophy on the patent institutions at that time. As a result, however, there have been a couple of attempts to strengthen patents. There are major reasons such as the passive aspect of getting the trade pressure from the U.S. with growing economic scale of Korea and the willingness for early introduction of new system with public officials who have created new items.

Q.2 (Negative issues caused by the right strengthening for patent) Since the enhancement of patents in 1980, the patent application of foreigner increased rapidly.

※ No. of patent application: Koreans(53.8%) > foreigners(46.2%) (1967-1976) => Koreans(26.0%) < foreigners(74.0%) (1977-1986) Are there any negative issues and problems from the rapid increase of foreigners' patent applications? (success and failure cases)

- When the substance patent system was introduced, the concerns for damages on domestic firms were high. After the introduction, however, there was no tangible damage like shrinking of domestic industries. Rather it was evaluated as an opportunity to inspire domestic firms.

Q.2-1 (Policy consulting) What kinds of institutions will you recommend for developing countries as a measure to strengthen patent rights?

- As a passive approach, you should restructure the patent system to satisfy the regulations of TRIPS; but in a proactive approach, you can introduce a punitive compensation system against intentional violators to secure tangible effects of patent rights. When violators do not afraid of patent right, the possibility to make payment gets lower and in turn, inventors who do not have adequate rewards would have weak motivation for additional research.

Q.3 Korea has lowered the bar on rights abuse and patent period extension to protect the rights of patent holders. Do you have any other institutions?

- There are some proactive measures like the expansion of patent scope, active joining in relevant treaties and regulation revision on compensation calculation (Article 128 of the law).

(3) Joining in international treaties and trends

Q.1 (Background of internationalization efforts) Not only Korea but also other countries have strengthened intellectual properties and accelerated their efforts for internationalization. What is the reason for this?

- Excluding advanced countries, only a few nations have pro-actively strengthened intellectual properties. Korea as a non-advanced nation has taken different tracks in this vein. The background of its active attitude is the same in the answer of (2), Q.1.

Q.1-1 Do you believe developing countries of weak capabilities for technological innovation should follow the international trend? (If so, please give us some rationales.)

- Nations which are and will be weak in technological innovation do not need to pay efforts to strengthen protection for intellectual properties. But nations which believe the reward necessity for creative efforts in the future need to take preemptive measures for protection enhancement to facilitate creative efforts.

Q.2 Please elaborate on the representative intellectual properties institutions of Korea, which were revised as a part of internationalization efforts.

- The representative case would be the revision and review of relevant laws and regulations for joining to TRIPs.

(4) Efficiency enhancement of examination system

Q.1 (Model cased of Korean examination system) Through the system of pre-registration without examination or introduction of 3-Track examination system, we have paid a lot of efforts to shorten the examination period. Please, let us know the success and failure stories related to Korean examination system.

- The greatest advantage of Korean examination system is the recruitment of top quality examiners.
- The weakest point of Korean examination system is no improvement of examination quality due to mandatory workload of examination cases.

Q.2 Based on ICT and developed infrastructure, Korea has enhanced the efficiency of examination system through IT system development.

(Policy consulting) Which measures will you recommend for the examination system efficiency improvement to developing countries with weak ICT and relevant infrastructures.

- KIPO has engaged in the policy for KIPO IT system export from 10 years ago.

(5) Introduction of utility model system

Q.1 Please elaborate on the background and issues of the introduction of utility model system in Korea and its economic impact.

- To ensure easy access of the public to patent institutions at the early stage of the introduction, the utility model system played a positive role. But the non-examination system caused great confusions and there are regrettable opinions on the positive impact of utility model system on technological innovation. It is difficult to acknowledge the great economic impact from the system. It would be better to close the system considering our technological advancement.

Q.2 The introduction of utility model system has made contributions to enhancement of technological innovation capability. Do you believe developing countries must introduce the system? (If so, why?)

- In the early stage of patent institution introduction or with great deviation in technological competency with advanced nations, the utility model might be meaningful.

2. Industrial technology development VS reestablishment of intellectual properties institutions

Q.1 What are the representative revisions of patent laws which have great impact on the industrial technology development of Korea? (For example, the introduction of substance patent has an impact on the pharmaceutical and chemical industries of Korea.)

- It is difficult to say any single revision of the law has a specific impact on the industrial technology development; but earlier and timely revision of the law has led the technological and industrial development.

Q.2 Were there any damages of domestic firms or industries from strengthening patents and internationalization? (If there were, please let us know the measures to overcome.)

- The introduction of substance patent institutions were expected to cause great damages to the pharmaceutical industry in Korea. Fortunately, however, the industry has paid utmost efforts to minimize the negative impacts so that damages were not serious as much as expected and our firms have enhanced their R&D capabilities.

Q.3 As for the policy consulting to developing countries for the development of industrial technology, which institution will be recommended to be introduced first?

-
- First of all, policies should concentrate on the expansion of application numbers since quantitative growth is a prerequisite for quality improvement.

Appendix 2 Consultation Opinion 2 (July 29, 2011)



Choi Taechang (choi@ablepatent.com)

- [Present] Representative patent attorney of Able Patent Law Firm
- 1997-2001: Chairman of Korea Institute for Electronic Commerce
- 1986-1989: Geneva Office (negotiation on intellectual properties in WIPO and GATT, UR)
- 1982-1983: Representative in the negotiation on intellectual properties between Korean and the U.S. from Super 301
- 1988-1989: Government representative for Treaty on Intellectual Property in respect of Integrated Circuits
- 1980-1996: Prof. of IIPTI, KIPO and division head for information and data, chief judge and appeal judges
- 1979-1980: Commission for the heavy and chemical industry
- 1968-1979: Ministry of Commerce and Industry and Secretary office for the President (Economy 2 part for the heavy and chemical industry)

1. Measures for institutional restructuring of intellectual properties (experience for consulting)

- ※ Expert's opinion on the cases of success and failure in overcoming issues like objections from interest parties in the course of execution of intellectual properties in Korea

(1) Scope expansion for patent protection

Q.1 (Execution of substance patent) the introduction of product patent has raised major concerns on the negative effects on the chemical and medicine industries in Korea. How about the objections from the interested parties and how was opinion adjustment done?

- Upon the introduction of substance patent, manufacturers for medicines and agricultural chemicals which relied on process patent made a strong objection while insisting that the public health and pharmaceutical development would be totally dependent on overseas firms since it would take over 10 years for them to apply for one patent.

- The government persuaded them based on the rational outcome of commissioned research and the Ministry of Public Health and Society and the Ministry of Agriculture supported incentives to firms which introduced the relevant technologies and executed supportive policies to facilitate substance patent development of them. Meanwhile, KIPO with support from WIPO dispatched examiners to the U.S. and European countries to develop examination guideline and to get examination training for substance patent.
- Within a year after the introduction of substance patent, domestic firms applied for substance patent and as a result, the technological development of domestic industries was facilitated.

Q.1-1 What kind of issues would developing countries, which have weak institutions for intellectual properties, face with the introduction of substance patent? (in the cultural, social and political aspect)

- Most of developing countries carry the risk of public resistance since they should pay a great amount of royalties for the license manufacturing or import expensive foreign medicines and agricultural chemicals with the introduction of substance patent.

Q.2 (Economic impact of the substance patent system) As a result, the introduction of substance patent (1987) facilitated the technological innovation of the chemical and pharmaceutical industries.

In line with the execution of TRIPs, developing countries should introduce the system in phase-in manner. Please, elaborate the consulting measures for the developing countries based on the experience of Korea.

- The domestic traditional pharmaceutical industry should be protected by establishing protective measures to give foreign patents on the transferred medicines.
- The institutional measures should be developed to ensure provision of medicines for the public health at an affordable price.

Q.3 (BM patent) After the introduction of substance patent, BM(Business Model) patent was introduced in 1998. Please, elaborate some issues of the introduction and development stage as of now as well as its impact on technological innovation activities in Korea.

- Korea with advanced IT and Internet technologies had many businesses based on BM patents in the Internet industry with an expectation for surge of applications in a relatively short-term; however many venture firms bankrupted without profitability. Since then, the examination criteria of KIPO has strengthened and restructured so as to enter into the stable phase of BM patent application.

- Since the U.S. which developed BM patent started not allow pure BM patent after Bilski Case and Korea has introduced sales method patent registration related to IT system, the examination criteria of major countries for BM patent seem to be integrated.

(2) Strengthening of patent protection and restrictions on right abuse

Q.1 (Enhancement of rights for patent holders) There was intention to limit the rights of foreign patent holders before 1980; but since then, there have some attempts to recover the rights of patent holders. What are the backgrounds of such changes in Korea from the perspective of economy, politics and culture?

- Prevention for patent holders from suffering unexpected loss by missing the opportunity for patent registration and provision of opportunity to offset the expenses for R&D and patent application are in line with the social justice and fair principle and these are accepted by other countries so that the patent recover institution was introduced to facilitate patent applications of foreigners.

Q.2 (Negative issues caused by the right strengthening for patent) Since the enhancement of patents in 1980, the patent application of foreigner increased rapidly.

- No of patent application: Koreans(53.8%) > foreigners(46.2%) (1967-1976) => Koreans(26.0%) < foreigners(74.0%) (1977-1986) Are there any negative issues and problems from the rapid increase of foreigners' patent applications? (success and failure cases)
- With strengthening of patent protection through the introduction of substance patent and BM patent and increasing patent applications of foreigners, the demand from other nations forced Korea to raise the protection level equivalent to that of advanced nations. Considering its dependency on the international trade for the economic growth, Korea got requests on the legal and economic standards in general including patent institutions to be upgraded to the international level so that Korea strengthened the patent protection despite some objections from the domestic industries.

Q.2-1 (Policy consulting) What kinds of institutions will you recommend for developing countries as a measure to strengthen patent rights?

- I would like to recommend selective joining to international treaties of WIPO, Paris Convention for the Protection of Industrial Property, PCT, IPC and TRIPs of WTO.
- The followings are also recommendable like multiple claim system for specification development, Patent Prosecution Highway (PPH), indigenous medicine protection institutions, priority examination system for applications, compulsory licensing after decision and grace period for 20 days after application.

(3) Efficiency enhancement of examination system

Q.1 (Model cased of Korean examination system) Through the system of pre-registration without examination or introduction of 3-Track examination system, we have paid a lot of efforts to shorten the examination period. Please, let us know the success and failure stories related to Korean examination system.

- Success story: The 3-track examination system is highly appreciated so that the U.S. introduced the system for the protection of applicators' right. In addition, the verification system on examination outcomes can be introduced to enhance the consistency and quality of examination.
- Failure case: The mandatory examination period shortened the period; but caused low quality examination and excessive issuance of opinion letters.

Q.2 Based on ICT and developed infrastructure, Korea has enhanced the efficiency of examination system through IT system development.

(Policy consulting) Which measures will you recommend for the examination system efficiency improvement to developing countries with weak ICT and relevant infrastructures?

- Based on KIPOnet developed and operated by Korean KIPO, some customized systems are developed and provided to developing countries in line with their examination system and IT competency. This IT program introduction and preparation for it like examiner education would enhance the efficiency of patent administration of developing countries.

(4) Introduction of utility model system

Q.1 Please, elaborate the background and issues of the introduction of utility model system in Korea and its economic impact

- Korea introduced the utility model protection institution by benchmarking that of Japan. It has been appreciated as an institution enhancing invention desire and contributing to the industrial development in the nations with low technological competency by allowing the registration of inventions in use of modified or applied technologies and even simple ideas even though there are some deviations in institutions of various nations like Germany and Australia.
- Once it was operated as non-examination system to digest the bottle-neck of examination; but it returned to an examination system due to the risk of patent right abuse. As the technological competency of Korea has sophisticated, people started to evade it due to shorter period of protection than patents; but I believe it is worth of sustainment considering the preference of small-and-medium firms and individual inventors.

Q.1-1 What are the most significant considerations for developing countries in terms of introduction of utility model institutions based on the experience of Korea?

- Instead of streamlining the items for claim to 1-2 and technological area, it would better to substantially reduce the application commission to boost invention will and contribute to the development of domestic industries.

2. Industrial technology development VS reestablishment of intellectual properties institutions

[1970~1980: Restructuring of intellectual properties institutions for introduction of advanced technologies]

Q.1 From the 1970s to the 1980s, Korea achieved surprising technological development with introduction of advanced technologies. What are intellectual properties institutions or other factors which play a significant role in attracting overseas advanced technologies and technicians?

- By joining in the international treaties for patents, the level of overseas applicators in the Korean patent institutions was heightened and the introduction of international patent classification system streamlined the application procedures for ease and convenient application of advanced patents in Korea.
- As being selected as international survey organization and international pre-examination organization by joining in PCT, Korea was able to review minimum documentation of PCT and got the confidence of the international society in terms of searching quality so that international firms like MS, IBM and 3M appointed KIPO as an international survey organization over 1,000 cases for couple of years. As a result, the suspicions of applicators for technology leakage of Korea have eradicated.
- With various activities as a member of IP-5 and WIPO, the international status of KIPO has enhanced and in turn, the patent institutions of Korea have developed to the level of advanced nations so as to enhance the credibility of Korea.

Q.2 Do you think it is possible for developing countries to ensure the industrial technology development with introduction and adjustment of advanced technologies by strengthening intellectual properties institutions as Korea did? (Would be the successful cases of Korea possible to apply in developing countries?)

- It would not be possible to apply as it is; but generally it would be possible to apply to developing countries.

Q.2-1 If the achievements of Korea are attributable to specific social, cultural and political features of Korea, please let us know.

- The great difference lies in much higher education level of Koreans than

other developing countries. Korea has had rich human resources to expedite technological development.

- Since Korea did not have any natural resources, it should be reliant on exports for the economic development so that people were well aware the importance of patents for the patent-based technologies for exports and they were in serious need of patent application to secure competitiveness of their products for export.
- The Korean government put the efforts on enhancing the quality of examiners by providing many training programs held by WIPO, USPTO and EPO.

[1980~the mid of 1990s: strengthening of intellectual properties institutions]

Following the heightened trade pressure from the U.S. in the 1980s, Korea engaged in policies to strengthen patents like (1) active introduction of overseas patent institutions of public officials in KIPO (2) and following flexible responses and R&D efforts of firms so that intellectual properties institutions and industrial technologies developed together.

Q.3 Do you think that developing countries are equipped with the government's efforts to introduce intellectual properties institutions (willingness of relevant officials to reorganize intellectual properties policies) 2) and proactive efforts of firms for institutional application and R&D? (Please, make detailed explanation on 1) and 2).)

- Willingness of the government Developing countries can be categorized into resource-rich countries and low technological capacity countries. The first group is weak in willingness for technological development and the development of patent institutions as well. The latter is weak in patent institution development since they believe such development will worsen the technological dependency by protecting only foreign technologies while the technological development is none of their business and it will take long time.
- Proactive efforts of firms for institutional application and R&D Businesses prefer the investment in resource development and believe licensing sales investment of overseas products is more profitable than the investment in technological development so that they have weak willingness.

Q.4-1 If they do not have one of two factors, what kinds of policy consulting can be made for restructuring of intellectual properties?

- While benchmarking Korea, relevant officials for patent and high-level policy makers can be invited to Korea for consulting and discussions in a forum to enhance their awareness on the necessity of application expansion for technological development. In addition, field training can be made for middle management of firms to enhance their understanding the technological advancement of small-and-medium firms and

comprehensive development interconnected with patent institutions. In the course of such efforts, the mediation and role of WIPO should be attracted.

Q.4 What kind of efforts or institutional supports did the Korean government and businesses make to minimize resistance and maximize the effects of introduction of overseas patent institutions?

- Patent education and overseas field trip by the industry or association were provided and incentives were provided for technological development capital when a company has a dedicated person and gets training for it. We also facilitated applications with assistance for patent application expense.

Q.4-1 Are there any other factors which enabled Korea to successfully introduce new patent institutions and to improve its capacity with domestic technological development?

- The enforcement of the U.S. for Article 301 of Trade Law, Article 301 of Special Law and Article 337 of Customs Law forcefully upgraded the level of Korean patent institutions.

[After TRIPs in 1995: Internationalization of intellectual properties institutions]

Q.5 With Enforcement of TRIPs in 1995, developing countries should strengthen intellectual properties step-by-step. Under such circumstance, which institution should get priority in your policy consulting?

- Once you join TRIPs, you will take responsibility for the international standard protection in terms of intellectual properties so that you should develop a plan to introduce regulations of TRIPs based on domestic institutions ahead of joining. Of course, there are five and 10 years of interim measures period for developing countries and least-developed countries, respectively.

Q.5-1 As for developing countries with really scarce activities for intellectual properties, the priority would be the expansion of patent applications. Are there any inducement measures for such purpose?

- As mentioned earlier, inducement measures are loan for technological development, incentive for application, assistance for application expense for small-and-medium businesses and designation of invention day to give award contributors.

Q.6 Repercussion from and solutions to the introduction of new institutions should differ depending on the cultural, political and social aspects. Which factors should be considered most for intellectual properties (patent) institutions by developing countries which are obviously opposing the strengthening policies unlike advanced nations?

-
- A national campaign is required to enhance the public awareness on the fact that it is difficult to survive without intellectual properties institutions in the knowledge based economy of the 21st century and efforts should be made to change national atmosphere with concentrated education to businesses and major players on the cases of technological development of other countries and Korea with support from WIPO.

Appendix 3 Consultation Opinion 3 (Sept. 23, 2011)



Kim Wonjun (wonjk@chonnam.ac.kr)

- [Present] Professor of Graduate School of Law, Chonnam National University (intellectual properties law)
- Master in Economy from University of Missouri-Columbia
- Pass the 14th Technology Examination (1978)
- KIPO examiner-chief judge
- Division head of examination 4 in KIPO
- Councilor of GENEVA Office of the MOFAT
- Chief Attorney of LEADERS International Patent Law Firm

With Enforcement of TRIPs, developing countries should strengthen intellectual properties step-by-step. Which institution would you recommend to developing countries which should develop policies and revise patent institutions to strengthen intellectual properties?

Among representative cases of Korea, please give your opinion on the backgrounds and execution method of one or two cases.

※ In addition, give us your expertise on measures to minimize resistance and maximize the effects of the introduction of institutions and policies based on the cases of Korea.

1. Employee Invention Compensation Plan to Encourage Inventions (1973)

Commitment to invention and effective encouragement for more inventions will be achieved only when inventors are rewarded with appropriate amount of compensations (application compensation, registration compensation and implementation compensation). Developing countries, in particular, face a serious problem in elevating more interest in invention. Enterprises could be the first to adopt the employee invention compensation plan to invigorate their research and development for technology upgrade. Such a plan will attract more people's attention with incentives or benefits.

In Korea, during the early 1980s, it had few enterprise patent applications with little interest in employee inventions. As its industrial and information technologies grew more sophisticated in the 1990s, so did its industrial property. Since Korea relied on export

heavily, 70% of its GDP, trade with foreign countries was vital. As such, the country had to regard IPRs (patent right and trademark) significantly for they were attached onto exporting goods and services. In this situation, the national government adopted the employee invention compensation plan into the 1973 amendment. This sparked many other large or small firms, universities and research centers to build such an institution after the 1980s. These institutions are being effectively operated until now.

Developing countries often face their people's poor awareness on invention. To raise such awareness, it is important to provide and publicize an incentive system through which people could be more interested in and enjoy creative activities. Increased patent applications will bring in an organization (KIPO) and more personnel (examiners and judges).

2. KIPO Establishment for Patent Administration Globalization (1977)

There are many patent managing officials from African or Latin American developing countries who say that they have no organization like KIPO or if any, there are only less than a dozen examiners reviewing patent cases. KIPO or other organization under the patent bureau should first be set up to secure human resources and budgets.

If developing countries are to comply with global intellectual property treaties of norms and gain support from the WIPO, they should form KIPO organization and secure personnel. Since national economic growth goes hand in hand with patent processing globalization, developing countries with growing economy must work to advance their patent administration.

In the case of Korea, KIPO started only with 277 staff members in 1977. But after 30 years in 2007, its total personnel reached 1517. The number of examiners grew to 828 from 52, and judges to 79 from 18. To support this, its budget jumped 200 times from KRW 1.5 billion to KRW 300 billion, if personnel and business expenses are summed.

Behind this, there were KIPO's globalization efforts going in parallel with Korea's economic growth and soaring patent application after the 1980s.

3. KIPI Establishment (1995) and Common Use of Patent Map

For further development of patent administration (application, review, registration, and ruling decision), relevant patent information should be made available not only to the KIPO but other enterprises and general public. It is because such patent information is the very infrastructure of patent administration.

The KIPO pushed office work computerization (Paperless Plan) in a phased manner from 1980. In 199s, the body set up a 7-year computerization plan on industrial property administration, opening online patent information services. In January 1999, the e-application system (Electric Filling system), KIPOnet(KIPO-NET system) was launched

in an attempt to bring information-oriented structure in overall patent administration. These efforts sharply increased patent administration efficiency. In November 2001, KIPOnet won the ISO 9001 certification. In July 2003, the number of online-based patent applications exceeded 1 million for the first time in the world.

In 1995, the KIPI was established after benchmarking Japan's IPO (JAPIO). As of 2011, thanks to the KIPI setup and online application structure in place, 98% of the KIPO examination process is dealt with online (internet) and its processing time is also shortened to 10 months. Plus, the Patent Map was developed and distributed for firms to use together with a computer program which helps the process automatically.

The online-based patent net deals with a majority of the country's patent applications through computer systems. Only few of them are on paper documents. The administrative process for this no longer relies on paper documents as it has done previously, but electronic document files are sent to and saved in KIPO central computer servers. To begin a review, KIPO examiners access relevant application files saved in the central computer. Such an enhanced patent information system is viewed to be a result of Korea's 7-year plan on the computerization of industrial property and government administration. Such endeavors of the country may present a good lesson for any developing nation that tries to benchmark its patent administration computerization.

[Appendix 4] Comment on Report of Korea's Development Experience

Name of Commentator (Nationality): Otakhonov Sherali (UZBEKISTAN)

Date: November 16, 2011

This research paper is very useful for developing countries to study experience of developed countries, especially experience of Korea, in the field of intellectual property protection and innovation progress. The researcher of this paper gives many interesting cases which also include process of technological development of Korea Republic after 1960's until nowadays.

First of all, I want to give a brief explaining how this issues important to the Republic of Uzbekistan. Today in Uzbekistan, the issue of intellectual property development and its prospects are very important during the transitional phase of innovation. One of the important conditions for creating a favorable innovation climate is to develop a complete and reliable system of protection of intellectual property. In this regard, and was admitted to the Law "On Copyright and Related Rights", which aims to regulate relations arising in connection with the creation and use of science.

Accordingly, I want to explain how this research is important and may useful for Uzbekistan.

- We need more information about the laws of Korea on intellectual property protection and improvement of the regulatory framework.

Uzbekistan is negotiating to join the WTO. In this regard, especially important to ensure the protection of intellectual property rights. TRIPS protects a wide range of rights holders. The disadvantage of the system of protection of intellectual property rights in the country within the rules of TRIPS is the lack of clearly defined procedures to protect intellectual property rights and against their violation (enforcement). This applies, above all, administrative and criminal legislation and the related process of law, border control systems.

- We need more information about the problems associated with the assessment of intellectual property.

Because the lag in establishing a legal framework for intellectual property valuation does not allow evaluate the intellectual resources with a high degree of reliability.

It should be noted that currently in Uzbekistan there is no the legal documents which regulate the procedure for inventory, assessment and management of intellectual property.

We need more information about economic and legal mechanisms for the payment of royalties for the transfer and use of rights to intellectual property.

In the legislation of the Republic of Uzbekistan there are no well-established economic/legal mechanisms of payment of royalties for the transfer and use of rights to intellectual property.

We need more information about the system for financing the results of intellectual property at the expense of state budget.

In conclusion, interesting to study the experience of formation of the IP Protection and innovation policy in Korea. The scientific and technological policies in the last 20-25 years the Korean government, is aimed at strengthening cooperation between the major government agencies interested in reorienting the economy from an industrial to an innovative path of development. It should be noted that Korea has started to form their innovation policies in a relatively weak development of the industrial sector as well as scientific and technical base.

Intellectual property can play a key role in the realization of any management strategies-whether the strategy of development, or strategy of stabilization, or anti-crisis strategy.

[Appendix 5] Comment on Report of Korea's Development Experience

Name of Commentator (Nationality): Biru Ashenafi Gebremichael (Ethiopia)

Date: October 9, 2011

This research is very much useful and on-time benefit for my country, Ethiopia, current socioeconomic development and technology growth. It really provides us with the existing conditions of developing countries regarding to designing and implementing effective Intellectual Property Rights System. I come up with some comments and try to explain how this research can help my country, Ethiopia, in relation to IPRs growth.

- We need information how to explore intellectual property right in poor country. (Does the technology and economic growth results good intellectual property or the intellectual property leads to technological and economic growth?)
- In my country, not only to create new technology which can be useful to the society, but also there is a problem of using the imported technologies properly. Thus, we need information how Korea government was enhance the intellectual property before the industrialization period of Korea.
- Does imitating negatively affect the development of intellectuality of the generation? Because Ethiopian government try to practice imitating of technology from developed countries. We need this research project to come with some information on how the government can encourage the society for incremental adaptation of technologies.
- We need more information on the specific criteria of modernized IPRs system. i.e.; in which specific area should Ethiopian government focus in order to develop standardized law and legislations of IPRs.
- This research project is so helpful Ethiopia as it covers the official's contribution in IPRs development. Whether due to lack of responsibility or lack of capacity of the officials, the Intellectual Property Right System in Ethiopia is very weak. Hence it would be more important if this research comes with idea or information of how the officials should react and manage changes in development of IPRs. It is also important if we got information on how the government should take measures and follow up the development of IPRs.
- We need also more information on how the government and other nonto develop his intellectual capacity and come up with new innovation which can be easily adopt by the community.
- Ethiopia can be more beneficiary from the experience of Korea's remarkable growth in IPRs and patent activities. At the current time, Ethiopia is one of the rapidly

developing countries in Africa. The role of IPRs in technological and economic growth, the best experience that we should consider is Korea's experience in IPRs. This research can be more useful to Ethiopia in building the standardized IPRs system in the country.

We need more information on the challenges that the Korea government faced while changing and improving the IPRs policies according to the international regimes.

- There is an Intellectual Property office in Ethiopia which is called "Ethiopian Intellectual Property Office (EIPO)". However, the role of this office is not as expected in IPRs growth. Thus, we need more information on the preconditions that should be fulfilled in establishing such office and how the office can work more effectively as per Korea's experience.

In general, this research paper is very useful as it provides us with the information of the best practices of Korea's patent system and policies which enable us to establish efficient intellectual property rights system in Ethiopia. Because without such good system, we cannot achieve our national plan and ensure sustainable development. Moreover, this information about Korea IPRs helps us not to face the problems, which Korea has faced at the earlier stage.

[Appendix 6] Korea's IPR Enforcement System

Korean IPR system has some different competent offices in charge according to the nature of the IPRs involved. As shown in the below table, KIPO is the competent office of industrial rights and trade secrets, while MOCT is in charge of the management of copyright.

Table A-1 | Legal Systems for the Protection of IPRs in Korea

Type of IPR		Law	Authority
Industrial Property Rights	Patents	Patent Act	Korean Intellectual Property Office (KIPO)
	Utility Models	Utility Model Act	
	Designs	Design Act	
	Trademarks	Trademark Act	
Unfair Competition Prevention and Trade Secrets Protection		Sound Records, Video Products and Game Software Act	
Semiconductor Integrated Circuit Layout Right		Semiconductor Act	Ministry of Culture, Sports and Tourism (MCT)
Copyright		Copyright Act	
Sound Records, Video Products and Game Software		Sound Records, Video Products and Game Software Act	
Computer Programs		Computer Programs Protection Act	
New Breed of Plants		Seed Industry Act	
Customs clearance regulation on counterfeit goods		Customs Act	Korea Customs Service

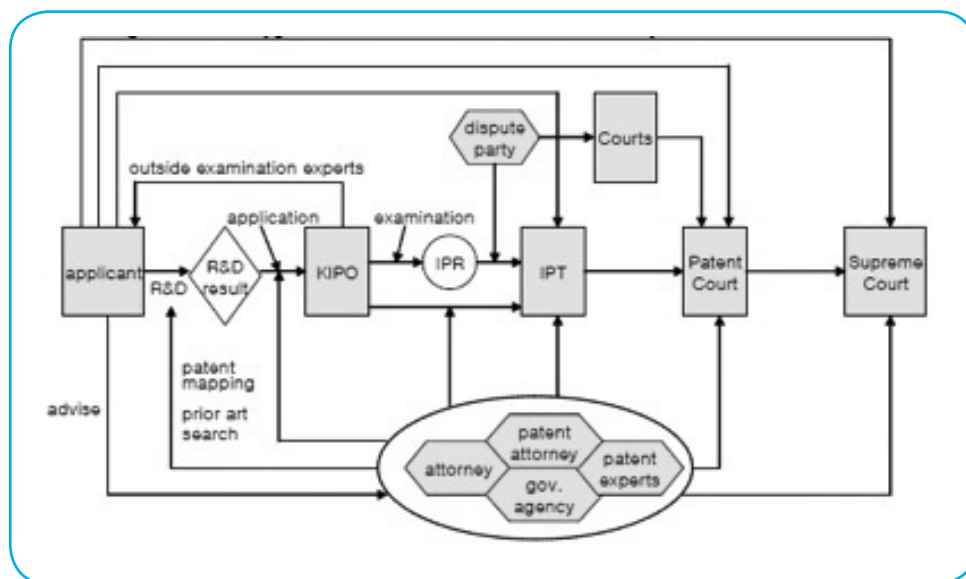
Source: Korea Intellectual Property Office
(website from <http://export.gov/southkorea/iprtoolkit/overview/index.asp>)

[Appendix 7] The Overall Intellectual Property System of Korea

Korea's IP system consisted of four subsystems: the invention creation system, the system for the grant of rights, the arbitration system and the infrastructure, including the information system and the dedicated organizations.

- **Invention Creation System:** composed of the competent organization and all the personnel from government research institutes, universities, firms and any individual inventors.
- **System for the Grant of Rights:** composed of the competent government offices including the ROK IP Office (KIPO), the Ministry of Finance and Economy (MOFE), the Ministry of Industry and Resources (MOIR), the Ministry of Information and Communication, the Ministry of Agriculture and the Ministry of Culture and Tourism.
- **Arbitration System:** composed of the competent judicial offices, including the Patent Court and other relevant bodies for judicial trial
- **Infrastructure:** composed of the competent information systems, with expertise's from the relevant societies including patent attorneys, consultants and advisers

Figure A-1 | Hypothetical Model for the Overall IP System



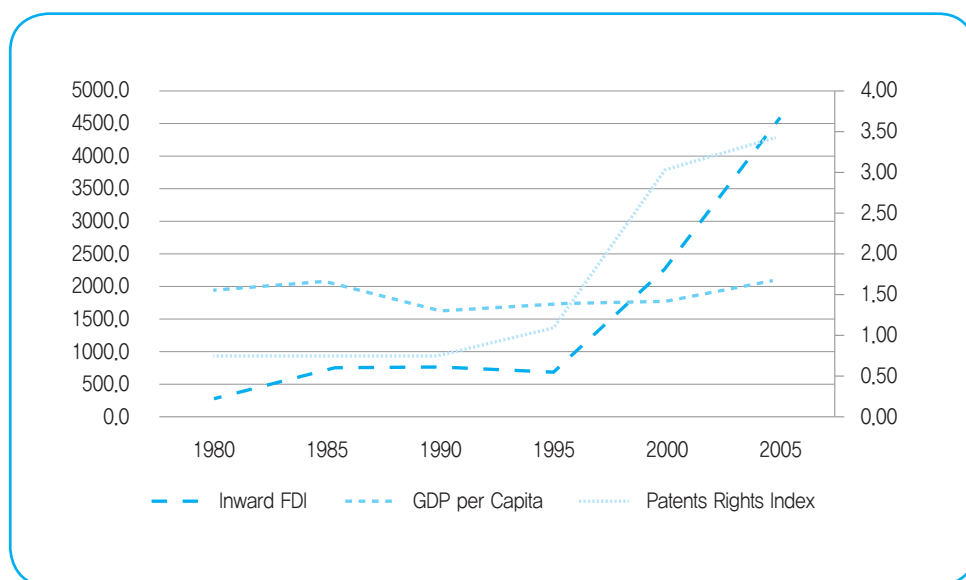
Abbr. KIPO: Korea Intellectual Property Office, IPT (Industrial Property Tribunal)

Source: Park (1998) as cited in Kim (2003, p.87)

[Appendix 8] Relations among IPR, FDI and GDP (Jordan's Case)

The below [Figure A-1] provides a brief overview of Jordan's illustrative case that the stronger IPR protection through IPR reforms can be associated with positive economic developments. During the 1990s, Jordan experienced upturns in FDI inflows following IPR and other reforms in the 1990s to enter the World Trade Organization in 2000. As of the year 1995, a positive association of IPR protection to FDI inflows may be found in the experience of Jordan. In other words, the implementation of IPR reforms (including patent reform) might be correlated with positive economic developments.

Figure A-2 | FDI, GDP and Patent Right



Note: Note: GDP in real 2000 USD thousands and inward stock of FDI in real 2000 USD millions are shown on the left axis; the Patent Rights Index score on the right axis. The Patent Rights Index scores can range from 0 to 5.
Source: OECD (2010, p.12)

[Appendix 9] Evolution of Korean IPR system and science and technology policies

Year	Science and technology related facts
1908	The first national laws on the protection of patent, design and trademark promulgated (Japan influence)
1910	Japanese IP law imposed after Japanese occupation
1946	After the liberation, the first modern-type industrial law promulgated (US influence): first-to-invent principle; plant and substance patents; 17-year term of patent protection
1949	Established Patent Bureau as an extended bureau of the Ministry of Commerce and Industry
1961	The first revision to the Patent law: the Utility Model Law, the Design law, and the Unfair Competition Prevention Law; 12-year term of patent protection; plant patent abolished.
1963	Revision of the Trademark Law
1966	Establishment of the Korea Institute of Science and Technology
1967	Establishment of the Bureau of Science and Technology, the Science and Technology Promotion Law enacted
1972	The Technology Development Promotion Act enacted
1973	Korea Patent Association (KPA) established
1974	The treaty on IP rights between Japan and Korea
1977	Established Korea Industrial Property Office(KIPO)
1978	The treaty on IP rights between US and Korea
1979	Joined World Intellectual Property Organization (WIPO)
1980	Joined Paris Convention
1982	Establishment of the Special National R&D Program, R&D to GDP ratio exceeded 1 percent
1984	Joined Patent Cooperation Treaty (PCT), shift of technology import system from approval system to reporting system
1986	Invention of pharmaceutical products and method of producing pharmaceuticals became patentable; 15-year term of patent protection
1987	Samsung vs. Texas Instruments legal case
1992	R&D to GDP ratio exceeded 2 percent
1994	Korea Invention Promotion Association (KIPA) founded under the provision of the Invention Promotion Act

Year	Science and technology related facts
1995	Korea Industrial Property Rights Information Center established. In compliance with TRIPs, the scope of patentable subjects enlarged and the patent term extended to 20 years.
1996	Korea Industrial Property Business Arrangement Center established
1997	Intellectual Property Rights Research Center established
1998	Patent Court opened, Korean Industrial Property Office (KIPO) established an on-line application system called KIPOnet, Introduction of the Quick Registration System (QRS) for utility models, Joined Strasbourg Agreement concerning the IPC and Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks
2000	The Technology Transfer Promotion law enacted
2002	Joined Trademark Law Treaty and International Convention for the Protection of New Varieties of Plants
2003	Joined Protocol Relating to the Madrid Agreement Concerning the International Registration of Marks
2004	Joined WIPO Copyright Treaty
2006	QRS abolished and transformed to the after-registration system
2008	KIPO introduced Customer-tailored three-track IP administration

Source: Lee et al. (2003) and Korea Intellectual Property Office (KIPO)'s website from www.kipo.go.kr/en/

www.ksp.go.kr

Ministry of Strategy and Finance, Republic of Korea

427-725, Republic of Korea Government Complex 2, Gwacheon, Korea Tel. 82-2-2150-7732 www.mosf.go.kr

KDI School of Public Policy and Management

130-868, 87 Hoegiro Dongdaemun Gu, Seoul, Korea Tel. 82-2-3299-1114 www.kdischool.ac.kr



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