THE CONTRIBUTION OF INTELLECTUAL PROPERTY RIGHTS OBTAINED BY SMALL AND MEDIUM-SIZED ENTERPRISES TO ECONOMIC AND TECHNOLOGICAL DEVELOPMENT: POLICIES TO BE IMPLEMENTED

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ABSTRACT

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This thesis analyses the utilization of intellectual property rights (IPRs) by small and medium-sized enterprises (SMEs), their contribution to economic and technological development and policies to be implemented for the SMEs to make more use of the system in order to reach a desired level of growth.

Small and medium-scaled enterprises constitute more than 90 % of all firms almost all over the world and a substantial proportion of employment and turnover. This fact bares the necessity for the SMEs to make more use of the intellectual property rights system which is one of the components of innovation and technological growth, in order to achieve the desired level of economic and technological development.

This paper discusses the existing and possible contribution of the IPRs obtained by SMEs to economic and technological development and the policies to be implemented in order to encourage intensive utilization of the system by the SMEs. The results of surveys previously carried out both in Turkey and abroad are incorporated within the results of a survey which was organized in the context of this thesis among 86 enterprises in 12 organized industrial zones all over Turkey. The latter survey measures the IPR utilization of the SMEs and the reasons behind under-utilization. Among the firms studied, 60 % of them are R&D performers, 34 % have a distinct R&D department while 56 % of them reported to have developed a new product, process or design. However only one third of these innovative firms have had an IP application and the percentage was even lower with IPR supports; only 2.3 % of the firms applied for IPR supports. The main reason for this under-utilization of both IPRs and IPR supports was found as lack of awareness. Policy proposals were tried to be put forward depending on the findings of the survey and raising awareness was defined as the most important measure to be taken.

Keywords: Small and Medium Sized Enterprises, Intellectual Property Rights, IPR Policies

ÖZ

KÜÇÜK VE ORTA BOY İŞLETMELER TARAFINDAN EDİNİLEN FİKRİ MÜLKİYET HAKLARININ EKONOMİK VE TEKNOLOJİK GELİŞMEYE ETKİLERİ: UYGULANMASI GEREKEN POLİTİKALAR

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Bu çalışma ile fikri mülkiyet haklarının küçük ve orta boy işletmeler (KOBİ) tarafından kullanımı, bunun ekonomik ve teknolojik gelişmeye katkıları ve arzu edilen gelişmişlik düzeyine ulaşılabilmesi amacıyla KOBİ'lerin bu haklardan daha fazla yararlanması için uygulanması gerekli politikalar incelenmektedir.

Küçük ve orta boy işletmeler dünya genelinde tüm firmaların % 90'ından fazlası ile toplam istihdam ve cironun önemli bir bölümünü oluşturmaktadır. Bu gerçek, arzu edilen ekonomik ve teknolojik gelişmişlik düzeyine ulaşılabilmesi için KOBİ'lerin fikri mülkiyet hakları ile ilgili mekanizmayı daha fazla kullanmaları gerekliliğini doğurmaktadır.

Bu çalışmada KOBİ'ler tarafından edinilen fikri mülkiyet haklarının ekonomik ve teknolojik gelişmeye mevcut ve olası katkıları ortaya konularak, KOBİ'lerin bu sistemden daha fazla yararlanmaları için uygulanması gerekli politikaların belirlenmesi amaçlanmaktadır. Hem yurt dışında hem yurt içinde bu yönde daha önce yapılmış çalışmaların sonuçları ile bu tez kapsamında 12 organize sanayi bölgesinde 86 firma ile yürütülen araştırmanın sonuçları değerlendirilmiştir. Yürütülen bu araştırmada KOBİ'lerin fikri mülkiyet haklarından oldukça az yararlandıkları ortaya konularak bunun nedenleri sorgulanmıştır. Çalışma sırasında incelenen firmalardan % 60'ının AR-GE faaliyetinde bulunduğu, % 34'ünün ayrı bir AR-GE birimi bulunduğu, firmaların % 56'sının yeni bir ürün, yöntem ya da tasarım geliştirdikleri belirlenmiştir. Ancak bu yenilikçi firmaların yalnızca üçte biri fikri mülkiyet koruması için başvuruda bulunmuştur. Fikri mülkiyet hakları ile ilgili destekler söz konusu olduğunda, başvuru yüzdesi daha da azdır; firmalardan yalnızca % 2.3'ü bu desteklerden yararlanmak için başvuruda bulunmuştur. Başvuru oranlarının düşük olmasının ana nedeni, fikri hakların ve desteklerin kapsamının yeterince bilinmemesi olarak belirlenmiştir. Araştırmanın sonuçlarına bağlı olarak politika önerileri getirilmiş, alınması gerekli en önemli tedbirin farkındalık oluşturulması olduğu tespit edilmiştir.

Anahtar Kelimeler: Küçük ve Orta Boy İşletmeler, Fikri Mülkiyet Hakları, FMH Politikaları

To Bora

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LIST OF ABBREVIATIONS

CIS	: Community Innovation Survey
DPT	: State Planning Organization
DTM	: Undersecretariat for Foreign Trade
EPC	: European Patent Convention
EPO	: European Patent Office
EU	: European Union
FDI	: Foreign Direct Investment
GDP	: Gross Domestic Product
GNDP	: Gross National Domestic Product
GNP	: Gross National Product
HALKBANK	: People's Bank of Turkey
ICT	: Information and Communication Technology
INPI	: French Patent Institute (Institut National de la Propriété Industrielle)
IP	: Intellectual Property
IPR	: Intellectual Property Right
IRC	: Innovation Relay Center
IT	: Information Technology
KIPO	: Korean Intellectual Property Office
KOSGEB	: Small and Medium Sized Industry Development Organization
MERIT	: Maastricht Economic Research Institute on Innovation and Technology
METU	: Middle East Technical University
OECD	: Organization for Economic Cooperation and Development
OIZ	: Organized Industrial Zone
PCT	: Patent Cooperation Treaty
PTO	: US Patent and Trademark Office
R&D	: Research and Development
SME	: Small and Medium-Sized Enterprise
SSIE	: Small-Scale Industry Estate
TDZ	: Technology Development Zone
TEKMER	: Center for Technology Development
TİDEB	: Presidency for Technology Development and Assessment
TOBB	: Turkish Union of Chambers and Stock Exchanges
TOSYÖV	: Turkish Foundation for Small and Medium Business
TPE	: Turkish Patent Institute
TSE	: Turkish Institute for Standards
TTGV	: Foundation for Technological Development

TÜBİTAK	: The Scientific and Technological Research Council of Turkey
USA	: United States of America
PTO	: Patent and Trademark Office of the USA
VAT	: Value-Added Tax
WIPO	: World Intellectual Property Organization

CHAPTER I

INTRODUCTION

Technology is one of the most effective variables to define economic development. Long term economic development can be achieved basically by accumulation of technological knowledge. It is very probable that inventions that will make the society go one step further, will come out as a result of encouraging the society for inventions.[1]

R&D policies of a country affect growth process. Although technology is usually treated as a public good, monopoly profits motivate discovery.[2] Countries that have economic freedom and protect property rights seem to grow faster. Property rights are seen as an indicator of R&D support.[3]

According to Solow, product improvement and cost reduction have little to do with R&D activity, but come out some other way; for example gathering of small suggestions from workers, engineers and customers. Thus, spending on R&D is not a sufficient measure of productivity.[4] According to Solow, there is a chance element in technological innovation. "The lightning strikes *where* the ground is prepared, but it does not necessarily strike *because* it is prepared." [5] This "chance element" is also valid for small and medium scaled enterprises where some innovations come out not as a result of R&D activities but spontaneously during production process. Therefore growth oriented policy has a lot to do here. Governments play direct role in organizing and financing research. They should also make R&D profitable for private sector through IPR regimes.

There are more than 16 million small or medium sized enterprises in the EU which constitute 99.8 % of all enterprises, 72 % of total employment and 65 % of the total turnover.[6] The situation is similar in Turkey; SMEs represent 98 % of all enterprises, 76.6 % of total employment, 26.5 % of investments, 38 % of added value and 10 % of exports.

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[1] Köker, Ali Rıza, "Patent Korumasının Ekonomik Etkisi", Türk Patent, May-June 2005, pp. 58-61.

[2] Romer, Paul M., The Origins of Endogenous Growth, Journal of Economic Perspectives, Vol. 8 No. 1, Winter 1994, p. 14, 18.

[3] Temple, Jonathan, The New Growth Evidence, Journal of Economic Literature, Vol. 37, March 1999, p.152.

[4] Solow, Robert M., Perspectives on Growth Theory, Journal of Economic Perspectives, Vol. 8, No. 1, Winter 1994, p. 53.

[5] Solow, Robert M., Learning From "Learning by Doing" Lessons for Economic Growth, Stanford University Press, Stanford, California, 1997. p.79

[6] Morgül, Fuat, Avrupa Birliği ve Türkiye'de KOBİ-Patent İlişkisi, Türk Patent Enstitüsü uzmanlık tezi, Ekim 2003, Ankara.

According to data obtained from KOSGEB, there are approximately 1,750,000 SMEs in Turkey, 250,000 of which are in manufacturing industry. Hence, improving the situation of the SMEs is a major way of enhancing economic development.

Until recently, SME definition in Turkey used to vary according to institutions and it was not in line with international definitions, particularly that of the EU. A regulation published in the Official Gazette dated 18 November 2005 and which was enforced on 18 May 2006, redefines SME's in accordance with EU definitions.

It cannot be expected for domestic technologies to develop where creative ideas are not protected and inventions not encouraged. Nor can it be expected for foreign investments based on technology to prefer such an environment.[7] There are such innovations which require long time and high cost to improve, but are easy to copy once improved. As long as such innovations are not protected by law, the innovators will not be encouraged to invest in such innovations.

Research on the political economy of patent system is scarce. Although there is plenty of literature about the central role of patents in today's economy, the fact that almost no political scientist has written about patent system is astonishing.[8]

There are many debates going on about the usefulness of the patent system. One side defends that patent protection is unnecessary and harmful, while the other side emphasizes the necessity and usefulness of the system.[9] On the developed world side, there exists a powerful lobby of those who believe that all IPRs are good for business, benefit the public and act as catalysts for technical development. They believe and argue that, if IPRs are good, more IPRs must be better. On the developing world side, there exists a lobby of those who believe that IPRs are likely to cripple the development of local industry and technology, will harm the local population and benefit only the developed world. They believe and argue that if IPRs are bad, therefore the fewer the better.[10]

There are different opinions about the usefulness of IPR policies especially for developing countries. The opponents of the system often claim that IPRs are not sufficient alone to promote growth and that other policies are needed. In fact, very strict IPR policies for under-developed or even for developing countries may be an obstacle for growth instead of enhancing it. Looser IPR regimes may be needed at the early stages of development.

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[7] Köker.

[8] Kahin, Brian, Information process patents in the U.S. and Europe: Policy avoidance and policy divergence, www.firstmonday.org/issues/issue8_3/kahin/

[9] Yalçıner, Uğur, Zeynep Kurt, Fikri ve Sınai Mülkiyet Korumasının Ekonomik ve Teknolojik Gelişme Üzerindeki Etkileri, Tarihsel Analiz. Presented at the Conference on Intellectual Property, METU, 1 October 2004, Ankara.

[10] Integrating Intellectual Property Rights and Development Policy Report of the Commission on Intellectual Property Rights, London, September 2002. Published by Commission on Intellectual Property Rights
http://www.iprcommission.org/papers/word/final_report/reportwordfinal.doc

However, trade and production are becoming more and more integrated all over the world and countries keeping away form internationally accepted IPR policies may be disadvantaged just the same. A proper balance of various policies to remove the weaknesses of under-developed or developing countries should be achieved in order to promote economic growth and welfare of the people. After all, IPR policies should be considered not as the final goal, but as one of the tools for general well-being of the world's population.

In the second section of this paper, a brief history and significance of intellectual property rights for development are given. Opposing views regarding IPR system are also discussed in this section.

The third section deals with the position of the IPR system in some countries along with the situation in Turkey. Different IPR implementations of the USA and the EU and their consequences are also discussed comparatively in this section.

The position of the SME's in IPR regimes is discussed in the fourth section. This section contains examples of SME contribution to development within IPR regimes and examples of survey results in the selected countries and sectors, trying to glimpse an idea of the usage of the IPR system by the SME's. The situation in Turkey is also discussed in this section where previous surveys carried out in Turkey about IPR utilization of the SMEs are presented. Talking about IPR system, it is the patent, utility model and industrial design that concern the SME's most, regarding their fields of work. These three fields of IP will mainly be concentrated on in this paper.

The fifth section discusses the results of the survey carried out within the scope of this thesis. The survey was carried out in 86 firms situated in 12 organized industrial zones. The firms were interrogated about their R&D capabilities, IPR utilization and appliance for IPR supports.

The policies needed to encourage the SME's to make more use of the IPR system are discussed in the sixth section. The current situation in Turkey, institutions involved in IPR supports as well as policy proposals are presented in this section.

Conclusions are given in section seven.

CHAPTER II

INTELLECTUAL PROPERTY RIGHTS AS MEANS FOR DEVELOPMENT

Technology and innovation are seen at the heart of development strategies. Policies have been developed for accumulation of technology and intellectual property protection has been regarded as means to protect inventions throughout the centuries. Countries emphasizing the role of IPRs in the past, have now reached an advanced level in economic and cultural terms. In addition to its role in development, integration of trade and production globally, builds the necessity for harmonization of the IPR system among countries. However, there are some views which have a cautious approach for the IPRs and their influence on growth especially in developing countries.

The following chapters lay out a brief history of the IPRs as well as their significance for economic development along with opposing views.

2.1 Brief History of Intellectual Property Rights

Some monarchs of Medieval Europe ensured special rights for inventors, which is considered as the beginning of IPR system, though not a totally secure one. The history of IPR is accepted to have begun in Medieval Venice and then developed in England.[11] IP laws in Venice date back to 15 th century. In those days there was death penalty for those exporting glass making technologies out of Venice.[12]

A legal system to protect designs first came out in France in 1711, in order to protect textile industry. In Japan, bylaws for design were introduced in 1888. In England and Italy, bylaws for design protection were put into force in 1787. First laws on trademark were introduced in England, America and France in 1857. Before that, merchant marks were used in Medieval Europe and they were used as symbols to indicate the territorial rights of the merchants.

US copyright policy in the 19 th century was extremely discriminatory about shifting production publishing activity into the US. It was after complaints from Europe, especially

[11] www.jpo.go.jp/seido_e/rekishi_e/rekisie.htm

[12] Minutes of Commission on Intellectual Property Rights, Conference on How Intellectual Property Rights Could Work Better for Developing Countries and Poor People, 21-22 February, 2002, www.iprcommission.org/papers/word/conferences/session_5.doc

from Charles Dickens that this policy was changed.[13] In Turkey, Distinctive Signs Act was adopted in 1871.[14]

Table 1 shows some important events related to IPRs both in Japan and in the world.

TABLE 1: Chronology of Outstanding Events Related to IPRs

Western Calendar	Japanese Patents	Overseas Patents	Social Trends
1400		**1474** Venetian Patent Law (Establishment of First Patent Law)	
1500			
1600		**1624** English patent law	**1623** Tokugawa Iemitsu, the third shogun of the Tokugawa family
1700		**1752** lightning arrester (by Franklin) 1790 U.S. Constitution **1791** French patent law	**1787** Kansei Reform
1800		**1814** locomotive engine invented (by Stephenson) **1815** Russian patent law **1851** sewing machine invented Italian patent law dynamite invented (by Nobel)	**1853** Commodore Perry's Ships demand opening of Japan

[13] Ibid.

[14] www.jpo.go.jp/seido_e/rekishi_e/rekisie.htm

TABLE 1 (continued)

Western Calendar	Japanese Patents	Overseas Patents	Social Trends
1868 (first year of the Meiji Era)		**1999** patent law adopted in unified Germany	**1868** Meiji Reforms in Japan
1880	**1884** (year 17 of the Meiji Era) trademark bylaws **1885** (year 18 of the Meiji Era) Patent Monopoly Act created a □rinitron□ for a system of patent rights in Japan **1888** (year 21 of the Meiji Era) design bylaws enacted	**1887** phonograph invented to record sound on a plate (by Edison)	**1885** the first Itoh cabinet is formed
1890	**1890** (year 23 of the Meiji Era) patent for a wooden weaving machine driven by human power registered (invented by Sakichi Toyoda) **1892** (year 25 of the Meiji Era) patent for a dry battery registered (by Senzo Okui) **1894** (year 27 of the Meiji Era) spherical property adhesion method patent registered (by Kokichi Mikimoto)	**1893** Diesel engine (by Diesel) **1895** wireless communication method (by Marconi)	**1890** traffic between Tokyo and Yokohama opened **1893** Tohoku line opened to traffic **1897** “fashion boom”
1900	**1905** (year 38 of the Meiji Era) **1908** (year 41 of the Meiji Era) patent for manufacture of a condiment having as a main component glutaminic acid soda (by Kikunae Ikeda) new utility model law		**1904** Japanese-Russian war breaks out **1909** Yamanote line starts operations

TABLE 1 (continued)

Western Calendar	Japanese Patents	Overseas Patents	Social Trends
1912 (first year of the Taisho Era)	**1913** (year 2 of the Taisho Era) patent for tortoise-shaped scrubbing brush registered (by Masaemon Nisio)	**1917** Soviet Constitution	**1914** Tokyo train station start operations
1920	**1925** (year 14 of the Taisho Era) patent for directional antenna for electric waves registered (by Syuji Yagi)		**1999** Einstein: Japan **1952** Kanto earthquake
1926 (first year of the Showa Era)	**1926** (first year of the Showa Era) patent for phototelegraphic method registered (by Yasujiro Niwa)	**1928** penicilin (by Fleming)	
1930	**1934** (year 9 of the Showa Era) Old Complex of the Patent Office completed	**1935** nylon (by Karohzasu)	
1940		**1941** polyester (by Whinfield)	**1941** Pacific war breaks out **1945** Pacific war ends
1950	**1950** (year 25 of the Showa Era) electrostatic induction field effect transistor patent registered (by Junichi Nishizawa) **1959** (year 34 of the Showa Era) Patent Law, New Utility Model Law, Design Law, revised Trademark Law		**1952** NHK broadcasts start (Tell me your Name) **1958** the 10,000 yen note is issued

TABLE 1 (continued)

Western Calendar	Japanese Patents	Overseas Patents	Social Trends
1960	**1963** (year 38 of the Showa Era) patent for synthetic leather registered (by Fukujima) **1967** (year 42 of the Showa Era) patent for color image reception tube using the □rinitron method registered (by Susumu Yoshida and 2 others)	**1967** World Intellectual Property Organization (WIPO) founded	**1964** Tokyo Olympics traffic on Tokaido Shinkansen Line starts
1970	**1975** (year 50 of the Showa Era) Japan joins the World Intellectual Property Right Organization **1978** (year 60 of the Showa Era) international applications based on the Patent Cooperation Treaty start	**1973** European Patent Treaty	**1970** Osaka International Expo **1972** Okinawa returned
1980	**1985** (year 60 of the Showa Era) 100 years of the industrial property rights system **1989** (first year of the Heisei Era) the Present Patent Office Complex completed		**1982** high-speed traffic Shinkansen line starts on the **1988** Seikan tunnel operations start
1989 (first year of the Heisei Era)			

TABLE 1 (continued)

Western Calendar	Japanese Patents	Overseas Patents	Social Trends
1990	1990 (year 2 of the Heisei Era) First electronic applications in the world are accepted **1992** (year 4 of the Heisei Era) system for registration of service marks introduced. **1994** (year 6 of the Heisei Era) system for unexamined new utility models introduced **1995** (year 7 of the Heisei Era) applications for patents are now accepted in EnglishPatent number 2 million issued	**1995** World Trade Organization (WTO) founded	**1992** Yamagata Shinkansen line starts operations **1995** Hanshin/Awaji Earthquake
1990	**1996** (year 8 of the Heisei Era) system for filing objections after a patent has been granted is introduced **1997** (year 9 of the Heisei Era) Accession to the Trademark Law Treaty) **1998** (year 10 of the Heisei Era) Acceptance of electronic applications via personal computer **1999** (year 11 of the Heisei Era) Opening of the Industrial Property Digital Library (IPDL		**1998** Nagano Winter Olympics

TABLE 1 (continued)

Western Calendar	Japanese Patents	Overseas Patents	Social Trends
2000	**2000** (year 12 of the Heisei Era) Digitization of procedures related to designs, trademarks and appeals (final decisions) Accession to the Madrid Protocol **2001** (year 13 of the Heisei Era) The National Center for Industrial Property Information (NCIPI) becomes an independent administrative institution **2002** (year 14 of the Heisei Era) Formulation of Intellectual Property Policy Outline Basic law on Intellectual Property **2003** (year 15 of the Heisei Era) Establishment of Intellectual Property Strategy Headquarters Formulation of The Program for Promoting the Creation,Protection and Exploitation of Intellectual Property	**2001** The first World Intellectual Property Day (April 26) Social Trends	**2001** Central Government Reform **2002** FIFA World Cup Joint Hosts: Japan and Korea

(Source : http ://www.deux.jpo.go.jp/cgi/search.cgi ?query=chronology&lang=en&root=short)

2.2 Significance of Intellectual Property Rights for Development

Today reaching a certain level of development in terms of economy and technology lies at the heart of each country's policy. It is essential to establish a competitive industry and participate in world trade in order to promote economic growth.

In order to ensure a competitive industry, R&D capabilities and industry should be linked. The ultimate goal of innovation policy is to enhance an increase in productivity, profitability and market share.[15]

International trade promotes specialization and specialization promotes trade. Under liberalized trade, developed economies with high costs of labour and natural resources should rely on intangible assets as a source of competitive advantage. Intangible assets i.e.,

[15] Innovation Policy in a Knowledge-Based Economy, Maastricht Economic Research Institute on Innovation and Technology, www.cordis.lu/innovation-policy/studies/2001/policy02.htm

intellectual capital are the principle source of competitive advantage in developed economies.[16] Although intellectual property legislation is valid in nation level in each country, there are efforts to harmonize it through international agreements and protocols. Many developed economies related intellectual property to trade and adopted the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). Since the enforcement of the TRIPS Agreement there are very few countries which have not signed it. So it may be commented that it is of no practical use to stay out of IPR protection.[17]

Developed countries have nearly ten times as many R&D scientists and technicians as developing countries (3.8 % of the population in the former and 0.4 % of the population in the latter). Developed countries spend 2-3.8 % of their GDP on R&D while developing countries spend only 0.5 % of their GDP for R&D purposes.[18] Hence, the level of R&D activities could be treated as an indication of development level.

IPRs are the means by which market economies reward inventions, innovations and cultural creation.[19] The reward is to give exclusive rights to produce, sell and license the products and technologies of intellectual creation. Patents stimulate innovation in two ways. First they create an incentive to innovate by giving the inventor a temporary monopoly. Second, since the details of a patent are disclosed to public, this accelerates the dissemination and therefore utilization of new knowledge for further innovation.[20] This is considered as competitive intelligence; searching the already disclosed information which is totally different from industrial espionage.[21]

Competitive intelligence helps:

- Raw information turn into intelligence,
- Early warning of changes in the competitive landscape,
- Early detection of opportunities and threats,
- Marketplace competitiveness through a greater understanding of the competitive environment of a company,

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[16] Kahin, Information process patents...

[17] Yalçıner, Uğur, Sınai Mülkiyetin İlkeleri, Ankara 2000.

[18] Saleh, Nabiel A.M., Research management issues in the Arab countries, Higher Education Policy, 15 (2002) p. 225.

[19] Maskus, Keith, Intellectual Property Rights in the Global Economy, www.colorado.edu/Economics/newsletter/spring2000-maskus.htm

[20] Innovation Policy in a Knowledge-Based Economy…

[21] Rackette, Karl, Compititive Intelligence: Exploiting the Power of Patent Information, paper presented in Conference on Intellectual Property Rights for SMEs- in cooperation with WIPO and TPE, İstanbul, January 10-11, 2005.
http://www.wipo.int/sme/en/activities/meetings/taiex_05/index.htm

- Managers to make informed decisions about research and development, marketing, investing, business strategies,
- Greater earnings,
- Add value to a company such as a SME.

IP protection can enable firms to increase their expected profits from investments in R&D which fosters innovation that normally would not occur if it was not for patents. And because patent system requires public disclosure, it can enhance scientific and technical information to be released to public, giving way to other innovations.[22] Most current and uniform information exists in patent documents. In spite of this fact, some research results indicate that patents are seen as a rich but often insufficiently utilized source of technical information.[23]

IPR means like patent, trademark, industrial design and utility models have a broad impact on economies. Economists state that these impacts may be achieved by international trade, foreign direct investment and licensing.[24]

Patents stimulate R&D by allowing successful firms to earn market profits. Stronger patent protection implies increased R&D and therefore increased growth. Shorter patent life will reduce the level of R&D. So in addition to stimulating R&D investments, patent policy can also influence a firm's innovative activity.[25] Patents also encourage invention by innovative small entrepreneurs by providing protection against big firms. Without patent protection, large firms could copy small firms' inventions and use their financial resources to commercialize their invention.[26]

Technological innovations have played an important role in the development of countries especially of USA, Japan and England. These innovations have been achieved by means of patent system which grants monopoly rights to the innovator for a certain period of time.[27] According to Barry Grossman, Venice, England, USA, France and Germany are the first countries to discover the importance of IP protection in technological and economic development.[28] Goodyear, Eastman Kodak, Polaroid, Toyota are some examples of multi-

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[22] To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy, A report by the Federal Trade Commission, October 2003. www.ftc.gov/opp/intellect/index.htm

[23] Meyer, Martin, Jan Timm Utecht and Tatiana Goloubeva, Free patent information as a source of policy analysis, World Patent Information, 25 (2003) p.223

[24] Yalçıner. Sınai Mülkiyetin…

[25] O'Donoghue, Ted, Patents in a Model of Endogenous Growth, Journal of Economic Growth, 9, 2004. pp. 92, 109.

[26] Kahin, Information process patents...

[27] Yalçıner, Sınai Mülkiyetin…

[28] Ibid.

national companies which started with a patent granted for one product improved by their founder.

A study led by Maastricht Economic Research Institute on innovation policy in a knowledge-based economy, draws on the role of innovation in modern economies and the role of intellectual property rights as a mechanism for the dissemination of new knowledge. According to that study, the dynamics of advanced economies depend less on investments in physical capital and more on investments in creation of knowledge. Today, knowledge is treated as a commodity that can be traded.[29]

A research by Mascus and Penubati indicates that, apart from other factors, national IPR regimes are related to an increase in income. Countries with the least amount of GDP cannot reserve resources for innovation and do not own any technological information to protect. Thus, the non-existence of IPR regime in those countries is acceptable. As the income and technological level in these countries increase, competition arises in the form of imitation and IPR protection appears at a weak level. As the economy develops, high quality goods with high technology start to be produced and it is then a strong IPR regime gets adopted.[30]

There are some views claiming that competition policies are opposing those of IPRs. In fact, both competition and patent policy can foster innovation, provided that a proper balance is obtained.[31] Like competition policy, patent policy serves to benefit the public. Both patents and competition make important contributions to innovation, consumer welfare and prosperity.

Protection provided for the inventor by means of granting a patent is very important in encouraging research and development activities and production of new technologies.[32] While the IP regime enhances innovation activities, it helps diffusion of information as all the inventions which are granted patent are published in that nation's language. This enables the production of new technologies. Apart from that, patent documents provide a valuable source of information and since they are published in a country's own language, the researchers are provided with the latest technological information in their native tongue.[33]

Patent system may also provide technology transfer from other countries through licensing. Foreign flow of invention and technology can occur best in an environment where innovation is protected. In summary, IP protection helps:

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[29] Innovation Policy in a Knowledge-Based Economy...

[30] Yalçıner, Sınai Mülkiyetin…

[31] To Promote Innovation: The Proper Balance of …

[32] Yalçıner, Sınai Mülkiyetin …

[33] Ibid.

- ➔ Prevent rivals from copying a product or service,
- ➔ Prevent unnecessary investment in R&D and marketing,
- ➔ Create a corporate identity through a trademark strategy,
- ➔ Increase a product's market value,
- ➔ Reach new markets,
- ➔ Allow the flow of technology and knowledge into the country.

In addition to these, firms that search the IP rights of rivals which may overlap with theirs, prevent unnecessary and costly cases.[34]

One of the advantages of patents is that they encourage innovation. But there is the concern if the public receives enough compensation in terms of new products and processes in return for the temporary potential for firms to control monopoly prices.[35] According to Arundel ideal IP regimes would provide adequate incentives without monopoly profits, and should not offer them when such an incentive is not needed to encourage innovation.

There are some components required in order to establish an ideal IP system in a country. According to Yalçıner, the components of an IP system in a country are:

- A well organized patent office,
- Participation in international agreements,
- Patent attorneys and,
- Specialized courts.[36]

However, the existence of IP legislation is not enough by itself for industrial development. A whole package of policies should be considered in order to assure technological growth. The answer to the following questions indicates best the potential of technological development:[37]

- For how long has IP legislation been enforced and how many times revised to catch up with international developments?
- Does the current legislation encourage innovation?
- Is the current legislation attractive/unattractive for foreign investors/ technology transfer?
- Does the legislation other than IP laws have any obstacles for foreign investors?

[34]Morgül.

[35] Arundel, Anthony, Patents in the Knowledge-Based Economy, www.iue.it/Personal/bhall/Arundel00_IPsurvey.pdf+%22Anthony+Arundel%22+%2, June6, 2005.

[36] Yalçıner, Sınai Mülkiyetin …

[37] Ibid.

In spite of these opinions very much in favour of the IPR system, there are many debates going on about the usefulness of the patent system. One side defends that patent protection is unnecessary and harmful, while the other side emphasizes the necessity and usefulness of the system.[38] On the developed world side, there exists a powerful lobby of those who believe that all IPRs are good for business, benefit the public and act as catalysts for technical development. On the developing world side, there exists a lobby of those who believe that IPRs are likely to cripple the development of local industry and technology, will harm the local population and benefit only the developed world.[39] The opponents of the system often claim that IPRs are not sufficient alone to promote growth and that other policies are needed. The following section tries to glimpse an idea of such views.

2.3 Cautious Views about IPR Regimes

In spite of evidence about the contribution of the IPR system in economic development, there are also opinions that the IPR system cannot be the same all over the world, that the inequality of the economic development levels of countries cannot foster equality in the IPR system. There are suggestions that developing countries could have looser IPR systems and that an IPR system is not sufficient alone to foster development. The level of IPR protection varies across countries; while technologically developed countries favour strong protection, some poorer nations defend weaker IPRs in order to be able to imitate technology.

Some researchers claim that there is evidence on qualitative benefits to society, probably because of the strong belief in technical progress and its benefits.[40] Some questions such as: "Does the IP regime encourage the development of effective new drugs that solve serious health problems? Is software easier to use?", arise.

According to Maskus, the existence of varying IPR standards in different countries has negative impact on world trade. He also finds that US FDI responds positively to IPR improvements in developing countries. Another finding of his is that even poor countries can benefit from a transparent IPR system provided that small scale product development and diffusion of information are enhanced. His last claim is that potential gains from IPR depend

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[38] Yalçıner, Uğur, Zeynep Kurt, Fikri ve Sınai Mülkiyet Korumasının Ekonomik ve Teknolojik Gelişme Üzerindeki Etkileri, Tarihsel Analiz. Presented at the Conference on Intellectual Property, METU, 1 October 2004, Ankara.

[39] Integrating Intellectual Property Rights and Development Policy Report of the Commission on Intellectual Property Rights, London, September 2002. Published by Commission on Intellectual Property Rights
http://www.iprcommission.org/papers/word/final_report/reportwordfinal.doc

[40] Arundel, Anthony, Patents in the Knowledge-Based…,

on the economy's characteristics. As stronger IPR standards are adopted, the market should be made more competitive and education and human capital should be invested in.[41]

According to a project result, a broad reassessment of IPR policies is essential from both policy and analytical view. The costs and benefits of the regime should be considered.[42]

But the case is not as simple as that IPRs are good for developed countries and bad for developing ones. Poor countries may find them useful provided they are accommodated to suit local needs. It has been suggested by many analysts that the appropriate diet for each developing country needs to be decided on the basis of what is best for its development, and that the international community and governments in all countries should take decisions with that in mind.

One danger of IP regimes is that they may be manipulated according to the interests of one firm or one sector group. Arundel gives 1952 change in the US patent law to meet the needs of pharmaceutical firms as example.[43]

Patents could be used by some firms strategically and Jaffe warns that such use of patents could be damaging: "To the extent that the firm's attention and resources are, at the margin, diverted from innovation itself towards the acquisition, defense and assertion against others of property rights, the social return to the endeavor as a whole is likely to fall". [44] This is of course a situation SME's cannot afford.

Report of the European Commission on Intellectual Property Rights considered whether and how intellectual property rights could play a role in helping the world meet the targets of reducing poverty, helping to combat disease, improving the health of mothers and children, enhancing access to education and contributing to sustainable development.[45] The report points out that the developing countries are far from being homogeneous. Not only do their scientific and technical capacities vary, but also their social and economic structures, and their inequalities of income and wealth. The policies to be implemented, together with policies on IPRs will vary accordingly between countries. Policies required in countries with a relatively advanced technological capability where most poor people happen to live, for instance India or China, may well differ from those in other countries with a weak capability, such as many countries in sub-Saharan Africa. The impact of IP policies on poor people will also vary according to socio-economic circumstances. What works in India, will not

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[41] Maskus.

[42] Project Summary on Intellectual Property in the Knowledge-Based Economy, The National Academies, Board on Science, Technology and Economic Policy. www7.nationalacademies.org/step/STEP_Projects_IPR-Phase_II_Description.html

[43] Arundel, Anthony, Patents in the Knowledge-Based…,

[44] Ibid.

[45] Integrating Intellectual Property Rights and Development..., p. 1

necessarily work in Brazil or Botswana[46] Many academic observers have conflicting opinions as to whether the social benefits of IPRs exceed their costs.

There is a sustained pressure on developing countries to increase the levels of IP protection in their own regimes, based on standards in developed countries.[47] Some IP protection seems to be appropriate at some stage for developing countries, as it has been historically for developed countries. The Commission report indicates that without doubt it can make an important contribution to research and innovation in developed countries, particularly in industries such as pharmaceuticals and chemicals. The system provides incentives for individuals and companies to invent and develop new technologies that may benefit to society. However, incentives work differently according to whether there is a capacity to respond to them. It is claimed that by conferring exclusive rights, costs are imposed on consumers and other users of protected technologies. In some cases, protection means that potential consumers or users, who are unable to pay the prices charged by IP owners, are deprived of access to the innovations by the IP system. The balance of costs and benefits will vary according to how rights are applied and according to economic and social circumstances. Standards of IP protection that may be suitable for developed countries may cause greater costs than benefits when applied in developing countries which must rely in large part on knowledge or products embodying knowledge generated elsewhere to satisfy basic needs and foster their development.

The Commissioners of the report regard IPRs as instruments of public policy which confer economic *privileges* on individuals or institutions solely for the purposes of contributing to the greater public good. The privilege is considered as means to an end, not an end in itself. Therefore IPRs must not be seen as the target but as the pathway leading to development.

The difficulty for developing countries in this context is that they are “second comers” in a world that has been shaped by the “first comers”. And because of that, it is a very different world from that in which the “first comers” developed. It is often claimed that we live in an age of globalization, where the world economy is becoming more integrated. The question posed is what the appropriate terms for that integration in the field of IPRs are. Just as the now-developed countries shaped their IP regimes to suit their particular economic, social and technological circumstances, so developing countries should in principle now be able to do the same.[48]

The Commission report underlines the fact that at the country level, there appears to be little economic research on developing countries that directly links the IPR regime to domestic innovation and development. An approach common to Germany, and the East

[46] Ibid., p.2

[47] Ibid., p.5

[48] Ibid., p.9

Asian countries (including China), was the introduction of easily obtained utility models which combined a lower standard of inventiveness, with registration rather than examination, and a shorter protection period. Studies of Japan's patent system in the period 1960-1993 have suggested that utility models were more important than patents in stimulating productivity growth. There is also some evidence relating innovation in particular sectors in Brazil and the Philippines to the availability of such utility models. In Japan, the evidence suggests that a system of "weak" protection based on utility models and industrial designs facilitated incremental innovation by small enterprises, and the absorption and diffusion of technology. This was associated, as in Taiwan and Korea, with an absence of patent protection for chemical and pharmaceutical products. Japan introduced protection for the latter only in 1976.[49]

There is more evidence about the impact of patent protection in developed countries. It appears to indicate that large firms regard patent protection of considerable importance in particular sectors (for example pharmaceuticals) but that in many sectors they are not considered important determinants of innovation. Moreover, patents seem to be hardly used by small and medium enterprises in most sectors in many developed countries, as means of promoting their innovation, or as a source of useful technical information. An important exception is the biopharmaceutical sector where companies often view their patent portfolios as their most important business asset. A recent study in the UK concluded that "formal IP regimes are applicable only to a small proportion of business activity, such as large manufacturing companies." Other informal methods of protection, and of obtaining technical information, were generally more effective for SMEs. [50]

Another question posed by the Commission in their report is to what extent IPRs promote growth. The evidence reviewed did not suggest strong direct effects on economic growth in developing countries. One recent study found that the more open to trade an economy, the more likely it was that patent rights would affect growth. According to this calculation in an open economy, stronger patent rights might increase growth rates by 0.66% per year. But there is some debate about causation because both openness to trade and the strength of the IPR regime tend to increase in any case with per capita income.

Other evidence suggests that the strength of patent protection increases with economic development, but that this does not occur until quite high levels of per capita income are achieved.

The main conclusion of the report is that for those developing countries that have acquired significant technological and innovative capabilities, there has generally been an association with "weak" rather than "strong" forms of IP protection during development stage. In most low income countries, with a weak scientific and technological infrastructure, IP

[49] Ibid., p.24

[50] Ibid., p.25

protection at the levels required by TRIPS is not a significant determinant of growth. On the contrary, rapid growth is more often associated with weaker IP protection. In technologically advanced developing countries, there is some evidence that IP protection becomes important at a stage of development, but that stage is not until a country is well into the category of upper middle income developing countries.[51]

According to Markus, who stated in a panel discussion, looking at worldwide scale, it can be seen that strength of IP rights tend to diminish until a medium level of development is achieved and strengthen again.[52] Marcus stresses that although the development impact of IP protection is not definite, it is true that it influences firms' behaviour of innovation or product differentiation.

Robert Sherwood believes that there are bright minds in every country. The question is how to use these abilities for economic development. He gives the example of significant innovations made at a university in Costa Rica but those innovations were disclosed as patents in Canada, Mexico or the USA.[53] Similarly, Connie Carter from the University of London points out that IP protection is important in developing countries as well, in terms of stimulating R&D. She underlines the fact that there are thousands of excellent Indian, Egyptian and Chinese researchers who work outside their countries due to weak patent protection and that they prefer to do their invention wherever it will be protected.[54]

It has been argued by Howard Pack that one of the potential areas where IPR plays a role is in pharmaceuticals but that life expectancy would be much more improved in under developed countries by providing access to clean water, health services or distributing drugs that are not protected by patents. He also stresses that despite the significance of IPR protection for software, most people in poor countries do not have access to electricity.[55]

According to Keith Maskus of The World Bank, there is little doubt among economists that technical change is the most significant source of growth and that is why technologically developed countries are wealthy.[56] According to Maskus, the answer to the question if IPRs matter for technical change, depends on the objective of the IP mentioned. Research managers in US were asked if the promise of a patent was important in their decision to undertake research activity, and the answer was no, except for pharmaceutical and biotechnology sectors.[57] But he admits that this is not the whole picture about IP and

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[51] Ibid., pp.25-26

[52] Intellectual Property Rights and Economic Development: An Agenda for the World Bank Group, Panel Discussion, www.worldbank.org/html/fpd/technet/sem-sums/march5.htm

[53] Ibid.

[54] Minutes of Commission on Intellectual Property Rights...

[55] Ibid.

[56] Ibid.

[57] Ibid.

innovation and that promoting incremental innovation which is more observed in developing economies through granting IP protection does work for development. He also suggests that developing countries should be provided significant market access if they are required to reform their IP systems, and that the costs of new IP systems be as limited as possible. Maskus agrees that IP system may work well should it be supported with appropriate policies of innovation.[58]

According to the findings of a survey led by Mansfield in 1986, lack of patent protection would have prevented the development of 60 % of pharmaceutical and 38 % of chemical inventions. In other sectors like machinery, electrical equipment, the prevention would have been about 11-17 %.[59]

Arundel gives the example of 'one-click' software for internet commerce, patented by Jeff Bezos of Amazon.com. He claims that this forces competitors to require their site visitors to use 'two' clicks. Amazon also spent money to prevent competitors such as Barnes and Noble from using a one-click system. The absurd result is wasted time for consumers and wasted funds spent by firms in litigation. [60]

The pronounced gap between developed and developing countries in terms of the benefits of the IPR system, exists between large enterprises and SMEs in terms of utilization of and benefiting from the system. Firms, including SMEs are intended to be encouraged to patent more. Since research results show that firms rely more on secrecy, this prevents disclosure of an innovation and may retard technological development. However, some do not see this as a disadvantage for development. For example Arundel does not consider repetitive R&D as a total loss and believes it may lead to useful discoveries.[61] Furthermore, he believes that making changes in patent legislation, such as reducing the costs, could increase patent propensity rates in some sectors but have little effect on firms whose majority of innovations are already patented.[62]

Economic theories state both positive and negative effects of intellectual property rights on growth. However with complementary and supplementary policies like price control, obligatory licensing, import policies and legislation for competition, IPR system can have an absolute positive effect.[63]

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[58] Ibid.

[59] Arundel, Patents in the Knowledge-Based…

[60] Ibid.

[61] Arundel, Anthony, The relative effectiveness of patents and secrecy for appropriation, Research Policy 30 (2001) p. 623.

[62] Arundel, Anthony, What percentage of innovations are patented? Empirical estimates for European firms, Research Policy 27 (1998) p. 128.

[63] Yalçıner, Sınai Mülkiyetin…

2.4 Concluding Remarks

The views about the IPR regimes vary extensively. There are some claiming that IPRs promote development while there are also those who claim that the regime favours growth only in the developed countries and it may prevent growth for the developing or under-developed countries. However, poor nations may also benefit from the IPR system in case the local needs are considered with care. History of the IPRs shows that the system has evolved throughout the years and developed countries of today are the ones to adopt first the IPR legislation. It has been suggested by many analysts that the appropriate diet for each developing country needs to be decided on the basis of what is best for its development, and that the international community and governments in all countries should take decisions with that in mind.

In fact, very strict IPR policies for under-developed or even for developing countries may be an obstacle for growth instead of enhancing it. Looser IPR regimes may be needed at the early stages of development. Still, because trade and production are becoming more and more integrated globally, it would be a disadvantage for countries to keep out of internationally accepted IPR policies. Therefore, policies to heal the weaknesses of under-developed or developing countries would help promote economic growth and welfare of the people. It should be kept in mind that IPR policies cannot be the final goal to achieve; they are one of the tools for general well-being of the world's population, which should be the main purpose of all policies.

CHAPTER III

SOME STYLIZED FACTS ON INTELLECTUAL PROPERTY RIGHTS IN SELECTED COUNTRIES

Many countries owe their technological development to the existence of an efficient IPR system. Japan, South Korea and Taiwan are examples to this kind of countries. It is probable that the climate for innovation favours technological development while very little technological development is observed in countries where there is little emphasis on intellectual property rights. The opposite also counts; there is very little concern for the IPR regime in countries with little technological development. Therefore it may be claimed that technological development and intellectual property rights have triggering effect on each other.

The following sections lay out some facts about the IPRs in selected countries.

3.1 Asian Countries

Among the Asian countries, Japan, South Korea, Taiwan and China constitute significant examples for the influence of the IPRs on economic growth and its triggering effect. Similarly, more developed regions and countries have more emphasis on the IPRs and therefore both the IPR system and the level of development encourage one another.

Japan, South Korea and Taiwan are said to have reached to a certain development level through the IPR system, particularly by means of utility models. On the other hand, foreign direct investment is reported to have a positive influence on the development of the IPR regime in China.

3.1.1 Japan

Japan is one of the countries where IP rights have been enjoyed extensively. Patent protection in Japan has been shaped in order to support industrial development.[64] A patent system was seen inevitable for development and Patent Monopoly Act was proclaimed on April 18, 1885. Before that view was shared by the Japanese, there was a tendency to dislike new things and Law for New Items was put into force in 1721 to ensure that no new types of products would be manufactured.[65] It can be observed from these two laws how Japan went through a dramatic change in terms of innovation in 164 years.

[64] Yalçıner, Sınai Mülkiyetin…

[65] www.jpo.go.jp/seido_e/rekishi_e/rekisie.htm

The enforcement of IP legislation in Japan played a very important role in industrial development in Japan and this accelerated technological development. Some 2.500.000 patents and utility models have been granted, which helped not only Japanese development, but also had contributions of development worldwide.[66] In the first year of the enforcement of Patent Act, in 1885, there were 425 patent applications. In 1990, the number of applications was 367.000 for patents and 138.000 for utility models.[67] Some of these inventions are wooden weaving machine driven by human power (by Sakichi Toyoda), cultured pearls (by Kokichi Mikimoto), sodium glutamate (by Kikunae Ikeda), vitamin B1 by (Umetaro Suzuki), KS steel (by Kotaro Honda), and phototelegraphic method (by Yasujiro Niwa). [68]

In many countries, foreign patent applications dominate all applications; however Japan is the only country where domestic applications constitute about 88 % of total patent applications.[69] This fact could be explained by Japan's tradition for inventions and how inventors are regarded by the society.

According to Maskus, after world war two the Japanese patent system was designed to encourage stealing of technology, encouraging only small scale incremental innovation. Maskus believes this system had a positive effect on technological development in Japan. After Japan was away from the catch-up phase and got close to technology frontier, the patent system was changed dramatically.[70]

Today, there are concerns about Japanese economy due to several reasons such as international competition and aging of population. In order to ensure a stable economy, the government adopted the Law of Promoting Technology Transfer from University to Industry in 1998.[71] Although 34 % of Japanese researchers were registered in universities in 1994, only 0.04 % of the patents originated from universities.[72] Thus, the new policy of academia-industry cooperation aimed at healing this imbalance. In fact, Japanese academic research is at top international level.[73] Figures 1 and 2 indicate the breakdown of R&D expenditures per sector in selected countries.

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[66] Ten Japanese Great Inventors, www.jpo.go.jp/seido_e/rekishi_e/judaie.htm

[67] Yalçıner, Sınai Mülkiyetin…

[68] Ten Japanese Great Inventors…

[69] Gökovalı, Ümmühan, Patent Applications/Grants and Their Economic Analysis for Turkey, Ph Thesis submitted to Middle East Technical University, Ankara, June 2003, p. 86.

[70] Minutes of Commission on Intellectual Property Rights...

[71] Fujisue, Kenzo, Promotion of academia-industry cooperation in Japan- establishing the "law of promoting technology transfer from university to industry" in Japan, Technovation, 18 (6/7) 1998 p. 371.

[72] Ibid., p. 373.

[73] Ibid., p. 374.

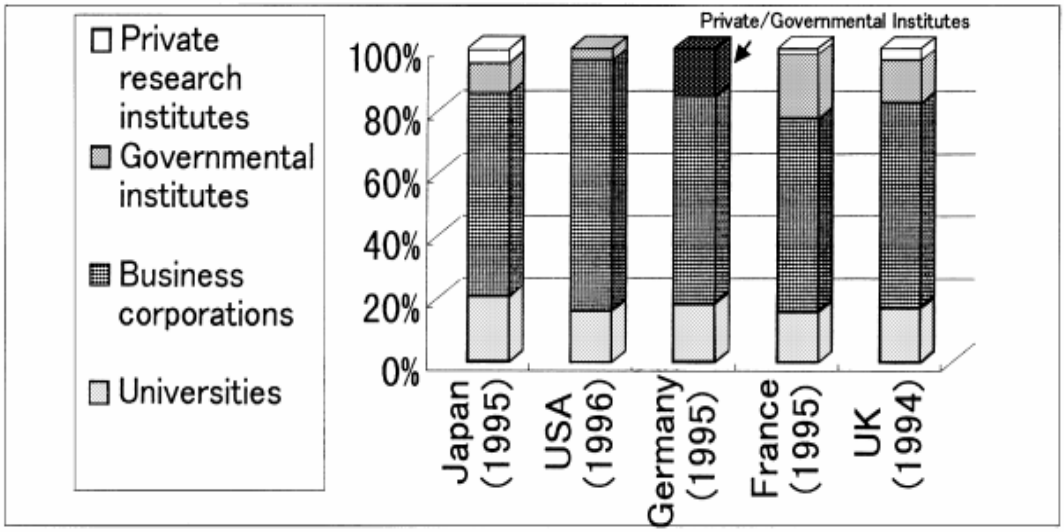

FIGURE 1: Research Carried Out By Different Institutes in Countries

(Source: Fujisue, Kenzo, Promotion of academia-industry cooperation in Japan- establishing the "law of promoting technology transfer from university to industry" in Japan, Technovation, 18 (6/7) 1998 p. 374.)

	Universities (%)	**Business corporations (%)**	**Governmental institutes (%)**	**Private research institutes (%)**
Japan (1995)	20.7	65.2	9.6	4.4
USA (1996)	15.1	72.8	3.3	
Germany (1995)	18.9	66.1		15.0
France (1995)	16.2	61.6	20.9	1.3
UK (1994)	17.5	65.2	13.8	3.4

FIGURE 2: Breakdown of Research Activities in Countries

(Source: Fujisue, Kenzo, Promotion of academia-industry cooperation in Japan- establishing the "law of promoting technology transfer from university to industry" in Japan, Technovation, 18 (6/7) 1998 p. 374.)

As seen from Figures 1 and 2, a huge portion of research activities is carried out by business corporations in five of the developed countries. The share is over 60 % including Japan and it is over 70 % for the USA.

Japanese firms create networks; regroup extensively to grow new technologies, share information and market original products jointly.[74] Universities, public authorities and SMEs have jointly participated in R&D activities in Japan. National universities started to collaborate with firms and some universities introduced technology-licensing organizations to

[74] Debroux, Philippe, The role of venture business culture in the renewal of Japanese Industry, International Business Review 9, (2000) p. 658.

commercialize the outcomes of their research through patents and technology transfer. Some 40 universities collaborate for this activity.[75]

Research management has become a concern for universities in many countries. This reflects some factors which are closely related such as changes in funding regimes, new social and economic demands for universities, changes in innovation practice, new cooperations for research between universities, industry, trade and wider community.[76]

Although they rank among the highest R&D-intensity, Japanese universities rank behind those in the rest of the world in terms of patents received. In 1994, only 129 patents were granted to Japanese universities while the universities in the USA received 976 patents.[77] Table 2 shows top 20 universities of Japan and the USA and patents registered.

TABLE 2: Top 20 Universities in Japan and the USA, Patents Granted

	Japanese University	**Patents**	**US University**	**Patent**
1	Tokai U.	24	U. of California	180
2	Osaka U.	11	MIT	108
3	Nagoya U.	11	Texas U.	99
4	Kinki U.	8	Stanford U.	62
5	Waseda U.	7	Wisconsin U.	51
6	Tokyo Inst. of Tech.	7	California Inst. of Tech.	46
7	Tohoku U.	6	Cornel U.	41
8	Hiroshima U.	5	Pennsylvania U.	38
9	Nagoya Inst. of Tech.	5	Iowa State U.	37
10	Matsumoto U. of Dental	4	NY State U.	36
11	Tokyo Inst. of Science	4	Florida U.	35
12	U. of Police	3	NC State U.	32
13	Kagoshima U.	3	Duke U.	32
14	Shizuoka U.	3	Minnesota U.	31
15	Tokyo Inst. of Medicine	3	Michigan U.	29
16	Nankai U.	3	Virginia Inst. of Tech.	28
17	Tokyo U.	2	John Hopkins U.	25
18	Kyushu U.	2	Utah U.	23
19	Tokyo U.	2	Michigan State U.	22
20	Tohoku Gakuin U.	2	Colombia U.	21
	Total of top 20 universities in Japan	129	Total of top 20 universities in US	976

(Source: Fujisue, Kenzo, Promotion of academia-industry cooperation in Japan- establishing the “law of promoting technology transfer from university to industry” in Japan, Technovation, 18 (6/7) 1998 p. 375.)

[75] Ibid., p. 662.

[76] Saleh, p. 225.

[77] Fujisue, p. 375.

In order to enforce the role of universities in Japan for IPR, i.e., innovation activities, some policy proposals have been suggested by Kenzo.[78] Those proposals include;

- Setting up of an organization that will transfer technology from academia to industry,
- Exemption from patent fees for universities,
- Financing of collaborations between universities and SMEs, by SME organizations,
- Certain funds and subsidies to be granted by the government.

There is a growing awareness among Japanese SMEs that intellectual property rights are a key element for development and for keeping competitive advantage. So some SMEs, who in a typical case have a workshop in the same building, have started to receive collective orders, like in the case of clusters. Sharing information and some equipment, they jointly apply for a patent or utility model when they develop an original technology or know-how.[79] With a huge experience with the IPRs and raising awareness among the SMEs, Japan seems likely to reach the desired level in terms of IPR utilization by the SMEs.

3.1.2 Republic of South Korea and Taiwan

According to Baer et al., creation of industrial profitability of R&D through patent and intellectual property rights, is a positive factor in the growth of Korea and Taiwan.[80] However, Markus claims that Korea, Taiwan and maybe China have expanded their technological base without IP protection.[81] In these two countries, foreign trade with developed countries has played a major role in producing their own technological capacity.[82]

Korean Patent Bureau was established in 1949 and Korean Intellectual Property Office (KIPO) was founded in 1977.[83] KIPO has supports for IPR acquisition by SMEs. It has a mission to guide SMEs for intellectual property rights like some patent offices in Europe do. It also facilitates market access of SMEs.[84]

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[78] Ibid., pp. 378-379.

[79] Debroux, p. 666.

[80] Baer Werner, William R. Miles and Allen B. Moran, The end of the Asian Myth: Why were the experts Fooled? World Development Vol.27 No. 10 p. 1740.

[81] Minutes of Commission on Intellectual Property Rights... www.iprcommission.org/papers/word/conferences/session_5.doc

[82] Yalçıner, Sınai Mülkiyetin…

[83] www.kipo.go.kr/kpo/eng/about_kipo/history.jsp?catmenu=m01_02

[84] www.kipo.go.kr/kpo/eng/ip_sys/policy.jsp?catmenu=m04_02

3.1.3 China

FDI is seen as one of the instruments of technology transfer. But the situation with foreign investments is that they do not usually prefer to reconstruct their R&D departments in another country. An estimated 89 % of the total R&D expenditures of the world's leading firms are spent in their home countries. Smaller firms are less internationalized and concentrate on high value-adding activities such as R&D at home.[85] If foreign firms are to construct their R&D department in the host countries, they usually prefer developed countries for that activity. Apart from that, they tend to developed less technology-intensive technologies abroad.[86]

Despite that fact, there are many examples from various countries where technological development has been achieved partly due to foreign investments. China is a good example for this. When foreign firms are granted a patent, domestic companies can benefit from that as an information source for new technologies. However, a country has to be able to develop its capacity to build technological accumulation domestically and reach a certain level of human capital in order to benefit from FDI.[87] Nevertheless, FDI has had a positive effect on domestic patent applications in China.

First patent act in China was enforced in 1985 and later revisions were made in 1993. Later some other revisions were made in 2000. Today the patent law of China is pretty much in line with international standards.[88]

Despite this situation, many Chinese firms prefer not to file for patents as a result of their R&D activities and rather prefer to keep them as trade secrets. Hence, the number of patent applications in China does not give a picture of R&D situation in the country. The number of new products does not reflect the innovative capacity either, as many Chinese firms report not really new products as new ones in order to get some incentives. Apart from that, these new products do not include process innovations which would normally be included in patents.

Still, external pressures, especially the USA, force China to ensure the implementation of patent legislation.[89] As a result, domestic patent applications in China have grown intensively. Table 3 shows local and foreign applications between the years 1996-2000.

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[85] Innovation Policy in a Knowledge-Based Economy...

[86] Gökovalı, p. 83.

[87] Ibid., pp. 88, 132.

[88] Cheung, Kui-yin and Ping Lin, Spillover effects of FDI on innovation in China: Evidence from the provincial data, China Economic Review 15 (2004) p. 30.

[89] Ibid.

TABLE 3: Local and Foreign Patent Applications in China

Type of application			
	1996	1998	2000
Domestic application	82,207	96,233	140,339
Patent (%)	13.95	14.26	18.06
Utility model (%)	60.02	53.22	48.78
Design (%)	26.03	32.51	33.16
Overseas application	20,528	25,756	30,343
Patent (%)	83.04	86.33	87.01
Utility model (%)	1.28	0.69	1.17
Design (%)	15.18	12.99	11.82

(Source: Cheung, Kui-yin and Ping Lin, Spillover effects of FDI on innovation in China: Evidence from the provincial data, China Economic Review 15 (2004) p. 32.)

It can be observed from Table 3 that like in Japan, domestic applications are much higher in number and have increased faster than overseas applications in China. If we look at the country in terms of provinces, we see that most of patent applications, as well as utility model and industrial design applications, were filed from the coastal region, which can be considered as more developed.[90] To put it in another way, the coastal region with higher level of economic development in terms of GDP per capita has higher levels of R&D and more patent applications.[91] Table 4 shows patent applications per regions in China.

[90] Ibid., pp. 33-34.

[91] Ibid., p. 43.

TABLE 4: Patent Applications per Regions in China (%)

	1995				2000			
	All type	**Invention**	**UM**	**Design**	**All type**	**Invention**	**UM**	**Design**
Coastal area								
Beijing	9.95	13.10	10.97	5.09	8.07	14.59	8.19	4.44
Tianjin	2.58	2.50	2.89	1.78	2.18	2.01	2.45	1.88
Hebei	4.23	4.46	5.02	1.91	3.00	2.57	3.99	1.86
Liaoning	6.96	7.87	8.20	2.93	5.58	5.56	8.17	2.01
Shanghai	3.84	3.66	3.81	4.06	8.85	20.17	4.53	8.79
Jiangsu	6.38	5.63	6.79	5.73	6.41	4.96	7.54	5.60
Zhejiang	6.32	3.74	5.82	9.40	8.05	3.68	7.29	11.42
Fujian	3.10	2.09	2.05	6.64	3.29	1.61	2.49	5.28
Shandong	7.23	6.72	7.31	7.36	7.82	5.33	9.42	6.93
Guangdong	12.09	4.85	5.94	33.80	16.48	7.53	9.91	30.34
Guangxi	1.93	2.27	1.85	1.90	1.37	1.08	1.74	1.03
Hainan	0.29	0.34	0.17	0.57	0.39	0.43	0.20	0.63
Subtotal	**64.90**	**57.24**	**60.82**	**81.18**	**71.48**	**69.52**	**65.93**	**80.20**
Central area								
Shanxi	1.43	1.82	1.71	0.43	1.15	1.45	1.41	0.63
In.Mongolia	1.01	1.23	1.13	0.56	0.89	1.00	0.99	0.69
Jilin	2.17	2.65	2.56	0.81	1.95	2.50	2.40	1.04
Heilongiiang	4.02	4.81	4.75	1.50	2.42	2.85	3.32	0.96
Anhui	1.61	1.59	1.84	0.97	1.46	1.29	1.77	1.13
Jiangxi	1.58	1.93	1.78	0.79	1.21	1.14	1.32	1.10
Henan	3.73	4.35	4.33	1.68	2.98	2.80	4.19	1.40
Hubei	3.13	4.02	3.59	1.31	2.72	3.30	3.45	1.40
Hunan	4.11	4.83	4.74	1.91	3.21	3.48	4.05	1.91
Subtotal	**22.80**	**27.21**	**26.41**	**9.96**	**18.01**	**19.82**	**22.91**	**10.25**
West region								
Chongqing	-	-	-	-	1.39	0.99	1.53	1.41
Sichuan	4.98	5.76	5.13	4.07	3.51	3.25	3.21	4.06
Guizhou	0.88	1.39	0.83	0.66	0.77	0.74	0.83	0.71
Yunnan	1.50	2.04	1.19	1.99	1.33	1.46	1.21	1.44
Shaanxi	2.69	3.33	3.08	1.21	1.62	1.86	2.15	0.77
Gansu	0.85	1.51	0.87	0.38	0.62	0.95	0.68	0.38
Qinghai	0.16	0.24	0.17	0.06	0.14	0.15	0.15	0.11
Ningxia	0.26	0.23	0.33	0.10	0.27	0.48	0.25	0.17
Xinjiang	0.95	1.01	1.16	0.36	0.85	0.77	1.15	0.48
Subtotal	**12.28**	**15.55**	**12.77**	**8.86**	**10.50**	**10.64**	**11.15**	**9.55**

(Source: Cheung, Kui-yin and Ping Lin, Spillover effects of FDI on innovation in China: Evidence from the provincial data, China Economic Review 15 (2004) p. 34.)

3.2 USA-Europe

IP regimes in the USA and in Europe have some variations. Some patentable inventions in the USA are not granted a patent in Europe, such as the software and Europe has some efforts to re-organize its patent system to catch up with the US level. Rather than putting forward some facts about the IPRs in USA and Europe separately, the situation is mentioned comparatively in order to be able to give a better idea of some details.

IP laws in the USA date back to the foundation of the country. Patent Act was enforced in 1890, a few years after the Constitution was adopted, while Europe got acquainted with the notion in the Middle Ages.

Although Europe has a strong scientific base and despite some outstanding innovative success such as the GSM mobile phone system and high speed trains (TGV), it is placed far behind USA in terms of innovation.[92] It lags behind in many technical fields including information and communications technology. In terms of the percentage of GDP spent for research, research costs in industry, research expenditure per capita, the European Union is far behind USA and Japan.[93] Some innovations which can be granted patents in the USA are not patented in Europe. Software is one of the fields whose patentability is a matter of dispute in Europe.

Arundel believes that European firms in technology and knowledge intense sectors are lagging behind their American competitors firstly for they fail to take advantage of the IP system and secondly for current IP regimes in Europe do not suit the needs of knowledge intensive firms.[94]

In the Green Paper presented by the European Commission, ease of obtaining patents, legal certainty and appropriate geographical coverage are considered essential for effective protection of innovation in Europe.[95] It has also been stressed that the fees for obtaining protection as well as enforcing it before courts should be brought down, especially to facilitate use of patents by SMEs.[96]

Research results indicate that US firms apply for a patent for a higher percentage of their innovations than European firms. Patent propensity rate was lower in Europe compared to USA in 1990's. Fees for patent application in the USA, including patent attorneys were one third of those in Europe. Relative market size for a patented product is as well higher in

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[92] Promoting innovation through patents Green Paper on the Community Patent and the Patent System in Europe, presented by the Commission, 1997.
www.europa.eu.int/comm/internal_market/en/indprop/patent/paten.pdf

[93] Ibid.

[94] Arundel, Patents in the Knowledge-Based…

[95] Ibid.

[96] Ibid.

the USA than in Europe. Apart from patenting costs, another reason for higher patent propensity rates in the USA is indicated as the patent legislation revised in 1982 to enable firms to protect their patents from infringement more strongly.[97]

According to Kahin, the US Patent and Trademark Office (PTO) has looser rules than in any country. Kahin claims this is partly because the PTO budget is directly tied to application and maintenance fees and the staff is trained to grant patents.[98] Recent work on the US patent system shows an increase in the number of patents granted in the 1990's, especially in health and IT sectors.[99] Licensing of technology has also increased by about 10 percent per year in the United States and by about 18 percent per year internationally.[100]

In order to increase patent propensity rates in Europe, European Patent Organization (EPO) has simplified patent procedures and reduced costs. Also, the EPO web-site helps people reach patent databases of all sorts of inventions. In Europe, studies for a European patent are going on.

Framework Programmes of the EU aim at developing the science and technology capacity in EU countries and innovation programme is one of the significant parts of the programme. Within the scope of the Framework Programme of the European Union, some support actions are intended to help preparations for community research and technological development, to encourage SME's to participate in such activities. These support actions include activities such as conferences, seminars, technology transfer related services, development of research strategies. Specific support actions are also established to stimulate, encourage and facilitate the participation of SMEs in the activities of such projects.[101] Intellectual property rights arising from a project within the programme will be owned by the participants unless the project is funded 100 % by the Commission. Similarly, access rights to knowledge resulting from a project will be granted on a royalty fee basis.

It has been found that 44 % of product innovations and 26 % of process innovations have been patented in Europe while this situation in the US is 51 % and 44 % respectively.[102] European firms consider speed-to-market as a means of competitive

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[97] Arundel, What percentage of innovations …

[98] Kahin, Brian, The Expansion of the Patent System: Politics and Political Economy, www.firstmonday.org/issues/issue6_1/kahin/index.html

[99] European Trend Chart on Innovation, European Yearbook of Innovation Indicators-2001, http://194.78.229.48/extranettrend/reports/documents/european_yearbook_innovation_indicators_2001.pdf

[100] Ryan, Micheal, P., Markets, Institutions, Intellectual Property Rights, and Development in a Knowledge-Based World Economy, p. 17.

[101] Provisions for Implementing Specific Support Actions, DG Information Society, European Commission, Draft Edition, 11 November 2002. www.iglortd.org/Content/FP6/SpecSupAct111102.doc

[102] Innovation Policy in a Knowledge-Based Economy...

advantage rather than patents. In another survey, R&D managers in the US were asked about the time taken by their rival firms to imitate patented and non-patented innovations. The results show that patenting increases the time by about 30 % (from 34 months for unpatented innovations to 44 months for patented ones).[103]

Although there are debates still going on about patentability of software programmes, many of them are granted patents in the USA. Software is considered as the extreme case of complex technology where one product may include thousands of patentable functions. In Europe 75 % of software patents are owned by large companies. SMEs in the programming sector are not aware that their invention can be protected by patent system. European Commission's Communication of February 1999 admits that SMEs lack basic knowledge about patents and that an information campaign is needed.[104] Another directive of the Commission dated 2001 indicates increasing awareness of European software SMEs about the patent system.

However in the US, patentability of computer programme related innovations has helped to improve the system, especially the SMEs working in the sector.[105] It can be detected here that SMEs working in software sector in the US are more aware of their intellectual property rights than those in Europe. Of course one of the underlying reasons is the dispute about the patentability of software programmes in Europe.

Some studies are going on in Europe to close the gap between the EU and the USA in terms of IPR regimes. More will be mentioned in the section related to SMEs.

3.3 Turkey

In Turkey, regulations related to IPR date back to 1871; Patent Law was first enacted in 1879. One outstanding aspect about the implementation of IPR policies in Turkey is that although the related legislation has been adopted as early as 1871 and 1879, synchronologically with today's many other developed countries, no revisions were made to fit the daily needs. Also, the legislation concerning industrial designs and geographical signs were not enacted before 1995.[106]

Today, Turkish IPR legislation is in accordance with the world standards and Turkey has signed many of the international agreements. Turkey's membership for customs union with the EU was enacted in 1995 where, among other things, equal level of intellectual property protection was emphasized. This shows that intellectual property protection at international level is necessary for economic integration. Turkey became a member of the

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[103] European Trend Chart on Innovation...

[104] Kahin, Brian, Information process patents...

[105] Ibid.

[106] Yalçıner, Sınai Mülkiyetin…

EPC in 2000. However this does not guarantee an increase in scientific research nor in technological development level. On the contrary Turkish firms, especially the SMEs had to face global competition while most of them are still producing in traditional methods.[107] Table 5 indicates the chronological milestones of IPR system in Turkey.

TABLE 5: Chronological Milestones of IPR Development in Turkey

DATE	ACHIEVEMENT
1871	Trademark Law (Alamet-i Farika Nizamnamesi)
1879	Patent Law (İhtira Beratı Kanunu)
1930	Participation in Paris Convention
1930	Participation in Madrid Agreement
1931	Publication of Intellectual Property Gazette
1955	Participation in European Patent Institute (The Hague)
1955	Retreat from Madrid Agreement
1965	Act of Trademark Registration Numbered 551
1976	Participation in WIPO Foundation Agreement
1977	Dissolution of European Patent Institute (The Hague)
1994	Foundation of Turkish Patent Institute
1995	• Participation in WTO and TRIPS Agreement • Enforcement of legislation concerning trademark, patent, utility model, industrial design and geographical signs. • Enforcement of Act No. 566 concerning patent protection of drugs. • Enforcement of the Act for penalties. • Enforcement of regulations and bylaws. • Participation in Stockholm text of Paris Convention. • Participation in STRASBOURG Agreement. • Participation in Nice Agreement. • Participation in Vienna Agreement.
1996	Participation in Patent Cooperation Treaty (PCT)
1998	• Participation in Budapest Agreement. • Participation in Locarno Agreement. • Enforcement of the Bylaw for Supporting Patent, Utility Model and Industrial Design Expenses
1999	• Patent protection for drugs begins. • Participation in Madrid Protocol.
2000	Participation in EPC.
2002 2003	Foundation of Courts of Law and Penalty for Intellectual Property Rights
2003	Enforcement of the Act no. 5000 which makes revisions in the Act No. 544 for the foundation of TPE.
2004	• Enforcement of the act about participation in The Hague Agreement. • Enforcement of the act about participation in TLT Agreement. • Revisions in IP legislation. • Repeal of the Bylaw for Supporting Patent, Utility Model and Industrial Design Expenses
2005	• Revisions in Trademark Regulation
2006	• Revisions in Industrial Design Regulation • Revisions in Patent and Industrial Design Acts (Draft)

(Source: Yalçıner and Kurt, Fikri ve Sınai Mülkiyet Korumasının Ekonomik ve Teknolojik Gelişme Üzerindeki Etkileri, Tarihsel Analiz, 2004.)

[107] Yeşiltaş, Özüm, The European Patent System and Turkey's Integration: The Role of Small And Medium Sized Enterprises, July 2005, Ankara.

The number of patent, utility model and industrial design applications has increased in recent years. 36 % of industrial design applications come from textile industry where SMEs constitute a high share. Patent, utility model and industrial design applications and grants in Turkey between 1981-2005 are given in Tables 6 through 9.

TABLE 6 : Patent Applications in Turkey Between 1981-2005

	No. Of Applications					No. Of Grants				
		Foreign					Foreign			
Year	Domestic	TPE	PCT	EPC	Total	Domestic	TPE	PCT	EPC	Total
1981	157	368	-	-	**525**	26	254	-	-	**280**
1982	126	385	-	-	**511**	42	304	-	-	**346**
1983	157	354	-	-	**511**	56	244	-	-	**300**
1984	153	447	-	-	**600**	66	344	-	-	**410**
1985	132	461	-	-	**593**	61	324	-	-	**385**
1986	175	551	-	-	**726**	56	227	-	-	**283**
1987	138	760	-	-	**898**	63	257	-	-	**320**
1988	154	746	-	-	**900**	53	319	-	-	**372**
1989	154	894	-	-	**1.048**	31	450	-	-	**481**
1990	138	1.108	-	-	**1.246**	48	438	-	-	**486**
1991	136	1.073	-	-	**1.209**	60	632	-	-	**692**
1992	190	1.062	-	-	**1.252**	54	621	-	-	**675**
1993	168	1.071	-	-	**1.239**	52	740	-	-	**792**
1994	148	1.244	-	-	**1.392**	61	1.131	-	-	**1.192**
1995	178	1.514	-	-	**1.692**	60	703	-	-	**763**
1996	187	692	26	-	**905**	47	554	-	-	**601**
1997	210	599	100	-	**909**	7	451	-	-	**458**
1998	214	593	140	-	**947**	32	360	7	-	**399**
1999	273	523	187	-	**983**	28	309	8	-	**345**
2000	266	443	179	-	**888**	21	276	47	-	**344**
2001	299	124	145	2	**570**	44	255	74	-	**373**
2002	388	91	69	37	**585**	44	360	114	11	**529**
2003	465	42	31	315	**853**	79	228	69	179	**555**
2004	636	68	60	1.319	**2.083**	53	227	80	977	**1.337**
2005	944	95	163	2.317	**3.519**	95	216	522	2.020	**2.853**
Total	**6.186**	**15.308**	**1.100**	**3.990**	**26.584**	**1.239**	**10.224**	**921**	**3.187**	**15.571**

(Source: TPE)

Table 6 indicates an increase in patent applications through the years. Although domestic patent applications have a constant increase, foreign applications increased greatly

in 1994 and 1995, when TPE was founded, and decreased more than by 50 % in 1996. The reason for this decrease was explained by Gökovalı as Turkey's signing the Patent Cooperation Treaty in 1996 and that applications through PCT were transferred to TPE with a time-lag.[108] However, the number of applications through PCT and directly to TPE does not add upto the number of previous foreign applications. This decrease may be due to the economic crises that occurred in mid 1995. International applications had a dramatic increase in 2004 and 2005 through EPC. The same can be stated for patent grants during the same years. Total domestic patent applications constitute less than one fourth of total applications while total domestic patent grants constitute less than one tenth of total grants.

As for utility models, the case is just the opposite of patents; domestic applications and grants constitute almost all of the applications and grants. Foreign applications, though very few, have a constant increase but this cannot be stated for foreign grants (Table 7).

TABLE 7: Utility Model Applications in Turkey Between 1995-2005

	No. Of Applications				**No. Of Grants**			
		Foreign				**Foreign**		
	Domestic	**TPE**	**PCT**	**Total**	**Domestic**	**TPE**	**PCT**	**Total**
1995	34	3	-	**37**	-	-	-	**-**
1996	178	3	-	**181**	-	-	-	**-**
1997	213	11	-	**224**	113	4	-	**117**
1998	279	17	1	**297**	141	9	-	**150**
1999	308	8	1	**317**	160	11	-	**171**
2000	444	14	2	**460**	146	4	-	**150**
2001	624	15	1	**640**	256	12	-	**268**
2002	913	14	-	**927**	376	14	-	**390**
2003	1.196	15	1	**1.212**	708	10	2	**720**
2004	1.461	20	30	**1.511**	679	8	-	**687**
2005	1.882	21	-	**1.903**	965	12	1	**978**
Total	**7.532**	**141**	**36**	**7.709**	**3.544**	**84**	**3**	**3.631**

(Source: TPE)

Considering industrial design applications, domestic applications and grants are more than ten times as high as foreign applications. Both foreign and domestic applications and grants show a constant increase through the years (Tables 8 and 9).

[108] Gökovalı, p. 140.

TABLE 8: Industrial Design Applications and Number of Designs in Turkey Between 1995-2005

	NO.OF APPLICATIONS				NO. OF DESIGNS		
Years	**Domestic**	**Foreign**	**Total**		**Domestic**	**Foreign**	**Total**
1995	1.506	28	1.534		3.212	35	3.247
1996	1.658	166	1.824		13.632	310	13.942
1997	1.951	185	2.136		13.176	340	13.516
1998	1.831	219	2.050		12.209	654	12.863
1999	1.697	244	1.941		8.666	411	9.077
2000	2.200	263	2.463		10.023	587	10.610
2001	2.557	274	2.831		13.299	537	13.836
2002	3.630	274	3.904		19.787	637	20.424
2003	3.998	286	4.284		21.778	706	22.484
2004	4.528	373	4.901		23.168	1.128	24.296
2005	4.932	403	5.335		26.826	1.230	28.056
Total	**30.488**	**2.715**	**33.203**		**138.950**	**5.345**	**144.295**

(Source: TPE)

TABLE 9: Industrial Design Grants and Number of Designs in Turkey Between 1995-2005

	NO.OF GRANTS				NO. OF DESIGNS		
Years	**Domestic**	**Foreign**	**Total**		**Domestic**	**Foreign**	**Total**
1995	387	26	413		1.767	32	1.799
1996	1.496	167	1.663		10.965	252	11.217
1997	1.649	134	1.783		12.262	277	12.539
1998	1.838	209	2.047		12.030	380	12.410
1999	1.577	250	1.827		9.093	788	9.881
2000	1.764	231	1.995		8.706	512	9.218
2001	2.421	262	2.683		11.545	572	12.117
2002	2.819	249	3.068		15.528	523	16.051
2003	3.315	237	3.552		17.389	580	17.969
2004	4.332	331	4.663		23.597	874	24.471
2005	4.847	424	5.271		26.246	1.235	27.481
TOTAL	**26.445**	**2.520**	**28.965**		**122.882**	**4.790**	**127.672**

(Source: TPE)

The number of foreign patent applications is much higher than domestic applications while domestic applications are much higher than foreign applications for utility models and designs. This may mean that foreign firms prefer to register their patentable products rather

than small innovations that require utility model protection. However, it is surprising that they do not prefer to register their designs; it would be expected for foreign firms to demand design protection as well because in Turkey copying of designs especially in textile industry is very common.

The study by Gökovalı carried out in 2003, lays out the major sectors by which patent application was made and grants provided. She used two concordances among which, there were not significant variations. According to MERIT concordance, top five sectors concerning all patent applications and grants in Turkey between the years 1985 and 1999 were chemistry, other machinery, electronics, metal products and pharmaceuticals.[109] The pharmaceuticals sector gains importance in 1995 and is at the top in 1999.

The sectors with the least number of patent applications and grants in the same period were aerospace, rubber and plastics, wood and furniture, shipbuilding, oil refining, computer and office machinery and non-ferrous basic metals.

When we look at the breakdown of applications in terms of foreign and domestic ones, top five sectors for foreign applications are chemistry, other machinery, electronics, pharmacy and metal products where again pharmacy raises to number one in 1999. When it comes to domestic applications, top five sectors are other machinery, metal products, other industrial products, electric machinery and instruments.[110]

Top five sectors concerning patent applications in Turkey belong to medium or high technology classes according to OECD classification of technology. Domestic applications are generally for medium and low technology sectors while foreign applications are for high and medium technology sectors. Domestic applications have an increasing tendency for low technology sectors (from 34 % in 1985 to 37 % in 1999) and a decreasing tendency for medium technology sectors (from 51 % in 1985 to 41 % in 1999). High technology sectors show an increase in domestic applications (from 15 % in 1985 to 22 % in 1999). Foreign applications have an increasing tendency for high technology sectors (from 26 % in 1985 to 41 % in 1999) and a decreasing tendency for medium technology sectors (from 53 % in 1985 to 39 % in 1999).[111]

3.4 Concluding Remarks

Legislation related to IPRs in Japan dates back to 1885; to 1890 in the US and to 1700's in Europe. Korean Patent Bureau was first established in 1949 and first patent act in China was enacted in 1985.

In spite of the fact that the first IPR legislation in Turkey was enacted in 1800's, Turkish Patent Institute was not founded until 1994 in parallel with Turkey's customs union

[109] Gökovalı, p. 142.
[110] Ibid., pp.143-148.
[111] Ibid., p.178.

with the EU. Legislation not having been revised from 1800's to 1995 according to daily needs might have been a factor for today's low level of IP applications in Turkey.

Some innovations that are patentable in the USA are not granted patents in Europe and in Turkey. Software is one field whose patentability is disputed over in Europe. For the fact that more innovation fields are patentable and that the relative market size for patented products is much higher in the US than in many countries, a larger portion of the innovations are patented in the US than in any other country.

Although patent and utility model applications have increased in Turkey throughout the years, the number of applications still seem very low compared to technologically advanced countries such as Japan, where in 1990, there were 367.000 applications for patents and 138.000 applications for utility models. However, according to TPE figures, there were only 1246 patent applications in Turkey in the same year, only 138 of them being domestic applications. The number of patent applications in Turkey in 2005 was 3159, still far behind the number of patent applications in Japan in 1990 (Table 6). On the other hand, the number of utility model applications in Turkey in 2005 was 7709 (Table 7), again far behind Japanese figures.

In 1994, patents obtained by top ten Japanese and US universities were 129 and 976 respectively (Table 2). Keeping in mind that less than 20 % of total research both in the US and in Japan is carried out by the universities (Figure 1), and majority of it by business corporations, a total number of 1392 patent applications in Turkey in the same year still falls behind these two countries.

In China, total number of applications for patents, utility model and design were over 100,000 in the years 1996 and 1998, and over 170,000 in 2000 (Table 3). In Turkey, total number of applications for the above mentioned sections of IP is less than 3000 in 1996, around 3200 in 1998 and around 3600 in 2000 (Tables 6, 7 and 8).

When the breakdown of patent applications and grants in terms of foreign and domestic is considered, foreign applications account for almost 80 % of total applications and about 90 % of total grants. This fact is an indication of low level technological advancement in Turkey. The same can be detected considering that top five domestic applications are for medium or low technology sectors and top five foreign applications are for high technology sectors.

When compared to technologically advanced countries, whose IPR legislation was enacted around the same time with Turkey, IPR applications are extensively low in Turkey. The IPR utilization by the SMEs is even lower; however this is the case with the SMEs of other countries as well.

CHAPTER IV

POSITION OF SMEs IN IPR REGIMES

Small and medium scaled enterprises constitute over 98 % of all enterprises and more than 70 % of total employment both in Europe and in Turkey. In Turkey, SMEs represent 98 % of all enterprises, 76.6 % of total employment, 26.5 % of investments, 38 % of added value and 10 % of exports.[112]

Since SMEs have a dynamic structure and are flexible in terms of market requirement, they have considerable innovative capacity. SME's survive crises better than big companies due to this dynamic characteristic, mainly by means of product differentiation. They are more capable of being innovative than big firms thanks to this flexible and dynamic structure. OECD figures show that SMEs in the USA contribute 2.38 times more innovations per employee than do larger firms.[113]

Although technological development and the IPR system are placed at the heart of economic development today, and the importance of SMEs for the economy is being emphasized more and more, policies fall short of encouraging SMEs to patent their innovations. Research results indicate under-utilization of the IPR system by the SMEs in most of the countries. Despite the importance of SMEs for the development of the economy and the potential of the IP system to raise the competitiveness of the SMEs, SMEs seem to underutilize the IP system.[114] Like in Turkey, European SMEs also have to cope with increasing global competition. According to OECD data, only 1-3 % of SMEs are technology developers, but 80-85 % of them are technology followers.[115]

The reasons of this under-utilization are often reported as lack of knowledge of the IPR system, high costs of granting- and defending in court- of a patent and the long duration required to grant an IP protection. Apart from patenting costs, SMEs face some problems in affording a patent attorney, translation costs and defense costs in case of infringement.

Talking about IPR system, it is the patent, utility model and industrial design that concern the SMEs most, regarding their fields of work. These three fields of IP will be concentrated on in this paper. In comparison with patents, utility models typically require a

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[112] CC Best Report, http://europa.eu.int/comm/enterprise_policy/enlargement/cc-best_directory/documents/sec_2001_2054_en.pdf

[113] Rahmy, Cherine Using The Intellectual Property System for Enhancing The Competitiveness Of SME's, paper presented at Conference on Intellectual Property Rights for SME's , organized by WIPO and TPE, İstanbul 2005, http://www.wipo.int/sme/en/activities/meetings/taiex_05/index.htm

[114] www.wipo.int/sme/en/ip_business/patents/patent_information.htm, 18.10.2005.

[115] Ibid.

lower level of inventive step, provide a shorter period of protection and, not being subject to any substantive examination prior to grant, are cheaper to obtain. Such characteristics are intended to make the system more attractive to SMEs which typically have neither the desire nor the capacity to use the patent system. [116]

According to research results, imitation lag patents provide is about 10 months in the USA while this period is 34 months for other methods of appropriation. In most European sectors, a higher number of firms find secrecy or lead time advantages more appropriate than patents. This is also true for firms with R&D intensity above 10 %. Patents are used mostly for simple technologies which are easy to copy, such as chemicals and pharmaceuticals; while other appropriation methods are preferred for more complex technologies such as ICT equipment. Results suggest little need to strengthen patent protection since alternative appropriation methods are available. It has been argued that stronger patent protection could lead to undesirable results such as use of patents to block competitors.[117]

Another reason for SMEs not to prefer patenting for their innovation is that they have to disclose their innovation to its very details and competitors may invent around this patent.[118] Ironically, this is named as one of the benefits of patent documents and means for technological development. But many firms, especially SMEs prefer to rely on secrecy for their inventions. Another reason why small firms patent less may be that their innovations are mostly incremental, not patentable[119], i.e. more appropriate for utility models. Still, utility model applications do not present a better picture either.

However, SMEs could benefit the system a lot more than they realize and in fact, these would be the benefits of the IPR system in general. First of all, patent information is useful for the SMEs for their strategic planning. By making use of the information in patent documents, SMEs may avoid unnecessary expenses for researching what has already been found, identify alternative technologies and get ideas for further innovation. Since the patent documents contain information in a standardized form for every field of technology, it is easy to explore new technologies.[120]

Secondly, by obtaining a patent for their innovation, they gain competitive advantage and bases for further innovation. Small firms could rely more on patenting since they lack huge manufacturing capacity and market advantage. Thus, patents could give the desired protection to their innovations. On the other hand, big firms, using their market advantage,

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[116] Integrating Intellectual Property Rights and Development Policy…

[117] Arundel, Patents in the Knowledge-Based … p. 1.

[118] Arundel, The relative effectiveness … p. 612.

[119] Ibid., p. 613.

[120] www.wipo.int/sme/en/ip_business/patents/patent_information.htm, 18.10.2005.

may choose not to get patent protection for their innovations.[121] It could be expected for small firms to patent more and later license their innovations to big firms to avoid marketing costs.[122] But this situation is not observed; large firms have a more established patenting culture and often make use of their in-house patent units to make both costs lower and patenting easier.

One of the findings of a study carried out by Maastricht Economic Research Institute on Innovation and Technology (MERIT) is that 34 % of large R&D performing firms use patent disclosure as an information input in their innovation activities, while only 18 % of those with fewer than 500 employees do so.[123] The study notes that the knowledge-driven economy requires more dynamism in terms of innovation and greater emphasis on the role of SMEs.[124]

In order to be internationally competitive SMEs need to constantly improve their efficiency, reduce production costs and enhance the reputation of their products by:

- Investing in research and development,
- Acquiring new technologies,
- Improving management practices,
- Developing creative and appealing designs,
- Marketing their products and services.

The above items require SMEs to make significant investments. Without intellectual property protection there is a strong risk that investments in R&D, product differentiation and marketing will be wasteful. Intellectual property enables SMEs to have exclusivity over the exploitation of their innovative products, their creative designs and their brands, thus creating an appropriate incentive for investing in improving their international competitiveness. Although SMEs have great innovative capacity, this capacity does not always come out mostly because they are not aware of the benefits of the IPR system. Since the research needs of SMEs are diffused and not clearly articulated, their capacity to make investments in research are limited. Hence, they should be supported by some organizations like business development centers.[125]

In certain high technology sectors, such as semiconductors, advanced or new materials, nanotechnology and biotechnology, innovative SMEs have been a key to the

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[121] Arundel, The relative effectiveness…p. 613.

[122] Arundel, What percentage of innovations …p. 139.

[123] Innovation Policy in a Knowledge-Based Economy...

[124] Ibid.

[125] Saleh, p. 232.

growth and dynamism of these sectors. In such sectors, patenting activity is comparatively much higher than in other sectors.[126]

Industrial design is a field even less known and less applied for by SMEs where they could have considerable market advantage. Industrial design protection can be as profitable for small firms as patents, because some small firms already develop new designs for their products without considering registration. Many of the products are recognized by their outer appearance and color, rather than their trademark or technical qualifications; such as consumer goods, cars, mobile phones. Designs are already released to public once they are marketed. Therefore there is no need to preoccupy with the idea that disclosure might lead to copying as disclosure is inevitable anyway. Since industrial design protection is provided relatively in a shorter time than patents and some SMEs already create designs even in the way of modification, they should be made more aware of the benefits of industrial design protection.

4.1 Examples of SME Contribution to Development, Where IPR Stands Here

There are outstanding cases where SME innovations have contributed highly to technological development. SMEs are the backbone of technology oriented Japan and many inventions in Japan emerged under the patent system. Applications and registrations for patents based on superior technologies are made not only by large companies, but also by SMEs. An example for these inventions is the phosphorescent material which is not radioactive.[127] Other examples are tealeaf rolling machine, tea roasting apparatus, tealeaf steaming apparatus, weaving machines.[128]

Sharp pencil, also known as mechanical pencil, invented by Tokuji Hayakawa, was developed in 1915, obtained a utility model protection in 1920, and was granted a patent in the USA in 1926. Hayakawa later founded the Sharp Corporation to work on electronics, named after the sharp-pencil.[129]

Although there are debates still going on about patentability of software programmes, many of them are granted patents in the USA. Software is considered as the extreme case of complex technology where one product may include thousands of patentable functions. In Europe 75 % of software patents are owned by large companies.

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[126] Intellectual Property and Small and Medium Sized Enterprises, Document prepared by the International Bureau of WIPO for WIPO Regional Meeting of Heads of Intellectual Property Offices of Caribbean Countries, Paramaribo, June 3 and 4, 2000.

[127] Experience of Japan, Institute of Intellectual Property, Tokyo, 2001, p. 72.

[128] Ibid., p. 25.

[129] Ibid., p. 34.

SMEs in the programming sector are not aware that their invention can be protected by patent system. European Commission's Communication of February 1999 admits that SMEs lack basic knowledge about patents and that an information campaign is needed.[130] Another directive of the Commission dated 2001 indicates increasing awareness of European software SMEs about the patent system.

However in the US, patentability of computer programme related innovations has helped improve the system, especially the SMEs working on the sector.[131] It can be detected here that SMEs working in software sector in the US are more aware of their intellectual property rights than their counterparts in Europe.

In spite of SME contributions to development through the IPR system, it is not that easy for the SMEs to protect their even patented products. This fact leads them not to patent some of their innovations. There are some cases where the SMEs have benefited extensively from IPRs, as well as those who found it difficult for them to keep their market share despite IPRs. Following WIPO case studies illustrate examples for both.

4.2 WIPO- Case Studies[132]

WIPO has special efforts to encourage SMEs to make more use of the IPR system. Member states of WIPO proposed a programme in 2000, focusing on intellectual property-related needs of the SMEs. Some of the cases reported by WIPO constitute examples for the significance or difficulties of the IPR system for the SMEs.

Helmed Spine Implants, a Greek Company producing medical spine implants, with 7 employees and annual turnover of 2.500.000 Euros, has no special R&D department or an IP strategy. Products of Helmed company have been copied several times by both Greek and foreign firms. Therefore the firm believes that the patent system can provide required protection. One of the difficulties the firm faces was the deadlines for applications, payments, renewal fees etc. Thus, they hired patent attorneys and that increased their R&D costs.

Still, the firm cannot make use of the IP system fully because of extensive copying of products. Hence, the firm chose to keep their innovation activities secret and apply for IP protection just before market release. The market is very competitive and it is difficult for SMEs to protect even their patented products.

Another WIPO case is TMG S.A, a Spanish company functioning in metallurgic industry, metal fixing elements with 24 employees. Since its foundation forty years ago, TMG has had continuous experience with IP issues. The firm has registered several utility models with European coverage thanks to the work of its own technical staff and the assistance of a legal firm. Furthermore, TMG makes extensive use of technological watch services to

[130] Kahin, Information process patents...

[131] Ibid.

[132] http://www.wipo.int/sme/en/index.jsp?sub_col=sme-cs

monitor competitors' products and the market environment. The Spanish Patent Office provides it with periodic information about the major technological developments in the industry, and TMG's personnel undertake regular field technological surveillance by attending industrial fairs and professional meetings.

Still TMG has serious doubts about the effectiveness of IP protection in an industrial sector where copying is an easy task and is a frequent practice among competitors. In fact, when TMG develops a prototype for a major client, it has hardly any control over it, leaving itself exposed to any competitor who may wish to copy it without infringing the law by introducing small changes in the original design.

The company perceives that IP protection is ineffective for two reasons. Firstly, IP administrative procedures in the European Patent Office are extremely long and expensive, so by the time a patent is granted, market opportunity may be lost. Secondly, legal actions are slow and very expensive. Despite its skepticism, TMG has also had some positive results from its IP experience. Occasionally, it has taken competitors to court because of copying of its products and it has been able to reach agreements for granting production rights in exchange for royalty payments.

This case study illustrates the situation in some industrial sectors where the technological cycles can force small companies to act expediently when it comes to IP protection. Consequently, official statistics do not reflect the real R&D efforts incurred by these small companies because they perceive too many risks in using IP protection as an up-front strategy. Nevertheless, SMEs should be aware that costs are not excessively high during the first stages of IP protection, and that initiating the IP process can give them priority to apply for protection in other countries.

A third example for WIPO case studies is the toy industry in India. The Indian toy industry is dominated by SMEs and micro enterprises. Keeping in mind the low awareness of IP-related issues among the SME sector in the country, the Small Industry Development Organization - the SME Development Agency of the country - working under the Ministry of Small Scale Industries had embarked upon a series of workshops and sensitization programmes on IPR for SMEs. One such workshop was devoted exclusively to the toy industry. After the workshop, one manufacturer met some of the resource persons and confessed that it was the first time that he understood the implications of IP to his business.

Another case study on the commercialization of a patented product is as follows:[133]

- Croatian pharmaceutical company (Pliva) discovers new antibiotic (azythromycin),
- Pliva applies for patent protection in Croatia and in various potential export markets,
- Large pharmaceutical multinational Pfizer searches patent databases and discovers the Pliva patent,

[133]Rahmy.

- Pliva licenses Pfizer to produce the antibiotic in the US as well as in some other countries in Western Europe while Pliva maintains the exclusive right to commercialize the antibiotic in Eastern Europe.

These case studies indicate how SMEs can benefit the IP system and make contributions to economy in general. Nevertheless, it is a real challenge for them to keep their market share and protect their even patented products from infringement. This is one of the factors that lead to under-utilization of the IPR system by the SMEs. Other reasons will be analyzed in the following sections.

4.3 Examples of Survey Results in Selected Countries, Sectors

According to Arundel, we are living in a "pro-patent" era where intellectual property regimes play a more important role in innovation and economic growth than in the past.[134] However, the IPR utilization among SMEs is quite low, compared to their innovative capabilities.

The results of various research so far show that patents are a secondary appropriation method, given alternatives, even in knowledge intensive sectors. Surveys in the USA, Europe and Australia show that secrecy is preferred by firms to patents. Japan shows an exception where patents are preferred for product innovations and secrecy for process innovations.[135] However, these results are averaged over all firms of all sizes and for all types of innovations. Other researchers have argued that patents could play a more important role for small firms that lack large-scale marketing and manufacturing capabilities to take advantage of lead-times.

There is not much research about the usage of patents among SMEs. The KNOW survey, conducted by the European Commission in seven EU countries in 2000, is one of the few.

The KNOW survey was made among small and medium scaled enterprises. Firms in five sectors were studied, including one low technology sector (food & beverages), one medium technology sector (chemicals excluding pharmaceuticals), one high technology manufacturing sector (telecom equipment) and two high technology service sectors (telecom services and computer services). Respondents from innovative firms, almost all of which performed R&D on either a continual or occasional basis, were asked to identify their most important protection method.[136]

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[134] Arundel, Patents in the Knowledge-Based…

[135] Arundel, The relative effectiveness …p. 611.

[136] Arundel, Patents in the Knowledge-Based …

Lead-time advantages and secrecy were named more frequently than patents, with the exception of the chemical sector. The value of patents is particularly low in the two service sectors, although this is partly because software is usually not patentable in Europe.

According to the findings of another survey led by Mansfield in 1986, lack of patent protection would have prevented the development of 60 % of pharmaceutical and 38 % of chemical inventions. In other sectors like machinery, electrical equipment, the prevention would have been about 11-17 %.[137]

Another study about the IPR usage of the SMEs is the European Trend Chart on Innovation. It has been stated in the European Trend Chart on Innovation that patent rates for the most economically important innovation increase by firm size and differ by the type of innovation (product, process, combined product and process, and service). The greatest differences are for product and process innovations; 90% of the product and 91% of the process innovations introduced by small firms with fewer than 250 employees were not patented, compared to 59% and 75%, respectively, of these innovations introduced by firms with 250- 1,250 employees.

According to European Chart for Innovation, the findings for patent usage of European SMEs are as follows:[138]

- Obtaining patents for small firms with fewer than 100 employees is much lower than big firms,
- Small firms rely more on secrecy than patenting, patenting is the second best option for protection,
- The most important reason for not patenting is high costs of application and defense costs in case of infringement,
- The existing incentives for patent protection are inadequate,
- Patent disclosure is the least important source of information,
- The most important sources are trade fairs, suppliers and customers.

European Trend Chart on Innovation puts forward the fact that only 25 % of the respondents declared to have obtained a patent, when SMEs were asked if they were granted a patent for their most important innovation. Table 10 indicates the percentage of firms who applied for patent protection for their most important innovation.

[137] Ibid.

[138] European Trend Chart on Innovation...

TABLE 10: Percentage of Firms That Have Applied for Patent for Their Most Important Innovation

Countries	Fewer than 250 employees	250-1205 employees	All respondent firms
Germany	15.4	44.0	29.4
France	24.4	31.6	26.6
Italy	19.6	50.0	31.1
Netherlands	28.9	48.0	33.3
Denmark	16.4	26.3	18.9
Greece	11.9	20.0	13.1
Total	**19.8**	**38.9**	**25.1**

(Source: European Trend Chart on Innovation, European Yearbook of Innovation Indicators-2001)

As can be seen from Table 10, SMEs (firms with employees fewer than 250) apply less for a patent than bigger firms. Nevertheless, patent application by big firms is below 50 % and that is not a high rate either.

Apart from patenting costs, SMEs face some problems in affording a patent attorney, translation costs and defense costs in case of infringement. For these reasons, in some European countries firms are assisted financially.[139]

According to a paper presented by Rahmy in a seminar about IPRs for SMEs, the reasons why European SMEs apply for patent protection are as follows: [140]

- Market exclusivity,
- To recover R&D investments,
- Facilitates licensing,
- Advantageous negotiating tool,
- Financing opportunities (venture capitalists, etc.),
- Favorable image and credibility,
- Freedom to operate,
- Higher market value and publicity,
- International expansion.

Economic value of patents has increased extensively in the USA since the beginning of the 1980's. This result has been reached through an increase in the number of patent applications from 60,000 in 1984 to 120,000 in 1995 and decision of several large firms to pursue licensing revenue from their patented inventions.[141] This approach is related to knowledge economy as a shift from competition based on price to that based on technical

[139] Ibid.

[140] Rahmy.

[141] Arundel, Patents in the Knowledge-Based …,

innovation and the rise of new technologies has been observed. The increase in patenting in the USA could be misleading. It may not be necessarily due to an increase in patent propensity rates, which is defined as the percentage of innovations that are patented[142] but it may be due to an increase in the generation of patentable innovations. Some of these new technologies can be named as biotechnology and information technology where many small firms are engaged.[143]

Although the number of patent applications has increased in the USA, so have R&D expenditures. Patent rate, defined as the number of patents per million US Dollars, has increased slightly since 1981. On the other hand, there has been a faster increase rate of patents in knowledge intensive sectors. ICT patents accounted for 16 % of all patents in the USPO in 1998. Data processing patents increased from 0.4 % in 1977 to 2.7 % in 1998; while patents related to molecular biology increased from 0.5 % in 1977 to 2.7 in 1998. Software patents increased by 33 % per year between 1992 and 1999, compared to an increase of 6.3 % in all patents.[144]

PACE survey carried out among Europe's largest R&D performing firms and another similar survey carried out in the USA emphasize the sectors where patenting of innovations are extensively high. Table 11 indicates the percentage of innovations for which a patent application was made by large firms in the USA between 1991-1993.[145]

TABLE 11: Percentage of Innovations for Which a Patent Application Was Made by Large Firms in the United States: 1991 - 1993

Sector	**Products**	**Processes**
Pharmaceuticals	96	42
Computers	56	28
Electronic components	35	9
Semiconductors	49	21
Communications equipment	60	49
Medical equipment	68	32
Precision instruments	41	24
Aerospace	51	36
All firms	**52**	**33**

(Source: Arundel, Patents in the Knowledge-Based Economy, www.iue.it/Personal/bhall/Arundel00_Ipsurvey.pdf+%22Anthony+Arundel%22+%2, Beleidstudies, Technologie Economy, 2001.)

[142] Arundel, , The relative effectiveness …p. 612.

[143] Ibid., p. 611.

[144] Arundel, Patents in the Knowledge-Based…,

[145] Ibid.

As indicated in Table 11, highest patenting percentage is seen in pharmaceuticals with 96 %. Medical and communication equipment follow with 68 and 60 % respectively. Patenting of product innovations is much more common than that of process innovations in all sectors.

Table 12 indicates the percentage of innovations for which a patent application was made by large firms in Europe between 1990-1992.[146]

TABLE 12: Percentage of Innovations for Which a Patent Application Was Made by Large Firms in Europe: 1990 to 1992

Sector	Products	Processes
Pharmaceuticals	79	46
Office & computing equipment	57	21
Electrical equipment	44	22
Communication equipment	47	23
Precision instruments (incl. Medical)	56	47
Other transport equipment (aerospace)	31	11
Transport & telecom services	21	12
All firms (sales weighted)	**36**	**25**
All firms (R&D weighted)	**44**	**26**

(Source: Arundel, Patents in the Knowledge-Based Economy, www.iue.it/Personal/bhall/Arundel00_Ipsurvey.pdf+%22Anthony+Arundel%22+%2, Beleidstudies, Technologie Economy, 2001.)

In Europe, as in the USA, the highest patenting percentage is seen in pharmaceuticals with 79 %, though lower than in the USA. Office and computing equipment and precision instruments including medical follow with 57 and 56 % respectively. As in the USA, patenting of product innovations is much more common than that of process innovations.

Tables 11 and 12 show that a higher percentage of innovations were patented in the USA than in Europe in early 1990's in similar sectors, with the exception of precision instruments and electronic components. The patenting of the latter two is higher in Europe. However, process innovations in pharmaceuticals, electronic components and precision instruments were patented in a higher percentage in Europe. Pharmaceuticals is the sector where the highest patenting percentage is observed both in Europe and in the USA. Patenting of process innovations in general is lower than that of products as indicated in both tables.

Some surveys do not consider only the number of employees for firm size. Another survey jointly realized by MERIT in the Netherlands and SESSI in France show that patent propensity of firms increase by annual sales (Figure 3).

[146] Ibid.

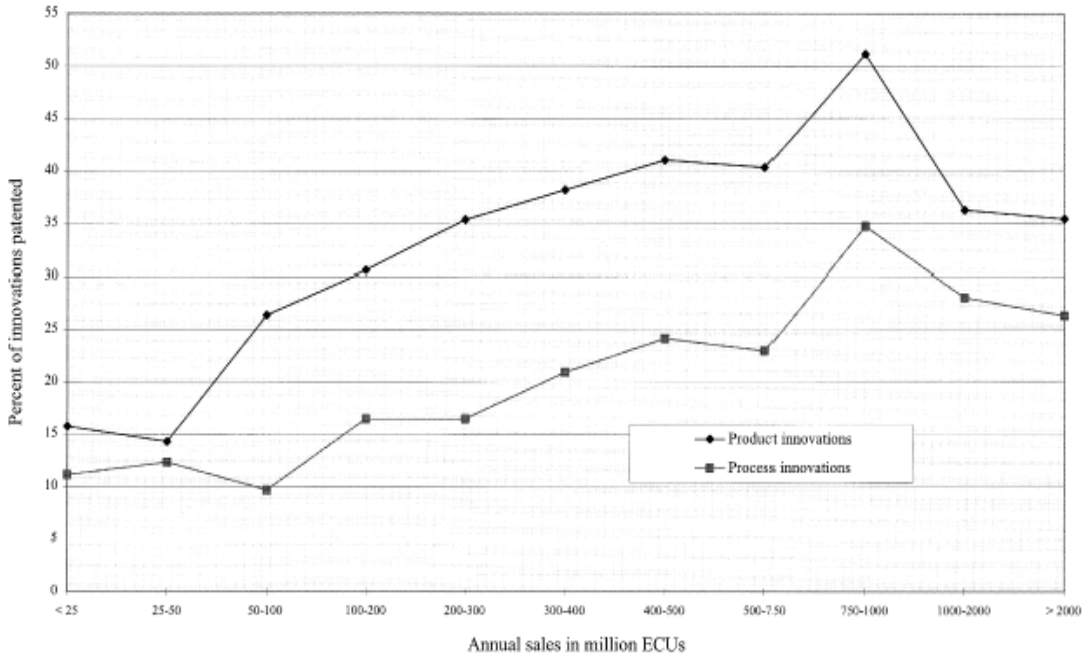

FIGURE 3: Patent Propensity Size Class (604 firms)

(Source: Arundel, What percentage of innovations....)

This result sheds light to the increase in IPR usage by increase in firm size, as SME definition in Europe as well as in Turkey includes annual turnover beside the number of employees.

One important reason for not patenting is the ineffectiveness of patent protection as seen by firms. A method of evaluating patent incentives is to look at imitation lags or the time required by a competitor to market a similar product or process. The difference in imitation lags between patented and unpatented innovations may provide a measure for the incentive value of patents.[147] Table 13 indicates imitation lags in months, for the firms' most significant product in USA and Japan.[148]

TABLE 13: Imitation Lags in Months for Firms' Most Significant Product in USA and Japan

	Japan		United States	
	Unpatented	Patented	Unpatented	Patented
Products	24	31 (30%)	34	44 (29%)
Processes	24	41 (71%)	41	50 (22%)

(Source: Arundel, Patents in the Knowledge-Based Economy, www.iue.it/Personal/bhall/Arundel00_Ipsurvey.pdf+%22Anthony+Arundel%22+%2, Beleidstudies, Technologie Economy, 2001.)

[147] Ibid.

[148] Ibid.

According to Table 13, the incentive value of a patented product is 7 months in Japan and 10 months in the USA. In both countries, patent protection for product innovations increases the imitation lag by 30 %. Patents for process innovations seem more advantageous in Japan; the imitation lag provided is 71 % while for the USA this is only 22 %, even less than for the patents in the same country.

Results on incentives show that appropriation methods other than patents have greater role in providing protection for firms' innovations. Surveys dating back to 1980's emphasize other methods of creating competitive advantages such as lead-time and secrecy.[149]

Tables 14 and 15 indicate the importance of patents as a method of appropriation for knowledge intensive sectors for the USA and Europe respectively. According to Table 14 patents are never the most effective appropriation method, even in pharmaceutical sector, but they run close. Lead time advantage is the most effective appropriation method in most sectors for product innovations; and secrecy for process innovations.[150] According to Table 15, in Europe patents are not seen as very important in terms of competitive advantage; their importance as perceived by European firms is much lower than by US firms for product innovations with the exception of precision instruments. For process innovations, the considered effectiveness of patents is much lower in Europe than in the USA.

TABLE 14: Percentage of Innovations for Which Selected Appropriation Methods Considered Effective in the United States: 1991 - 1993

	Product Innovations			**Process Innovations**		
Sector	**Secrecy**	**Patents**	**Lead time**	**Secrecy**	**Patents**	**Lead time**
Pharmaceuticals	**53.6**	50.2	50.1	**68.1**	36.2	35.5
Computers	45.0	41.7	**62.9**	**43.4**	30.5	40.5
Electronic components	34.0	21.4	**45.6**	**46.5**	15.2	42.7
Semiconductors	**60.0**	26.7	53.3	**57.5**	23.3	47.8
Communications equip	47.2	25.9	**54.1**	35.3	14.7	**43.0**
Medical equipment	51.0	54.7	**58.1**	**49.2**	34.0	45.2
Precision instruments	47.3	25.9	**54.1**	**43.6**	16.8	35.5
Aerospace	55.1	32.9	**58.0**	**49.3**	13.3	42. 2
All manuf. Sectors	*51.2*	*34.7*	*52.4*	*51.2*	*23.4*	*38.3*

(Source: Arundel, Patents in the Knowledge-Based Economy, www.iue.it/Personal/bhall/Arundel00_Ipsurvey.pdf+%22Anthony+Arundel%22+%2, Beleidstudies, Technologie Economy, 2001.)

[149] Ibid.

[150] Ibid.

TABLE 15 : Percentage of European Firms Which Find Patents as 'Very Important' or 'Crucial' for Protecting Competitive Advantages: 1990 - 1992

Sector	**Products**	**Processes**
Chemicals	29	17
Computers	13	10
Electronic equip.	19	5
Communications equip	13	10
Precision instruments	30	15
Other transport	44	5

(Source: Arundel, Patents in the Knowledge-Based Economy, www.iue.it/Personal/bhall/Arundel00_Ipsurvey.pdf+%22Anthony+Arundel%22+%2, Beleidstudies, Technologie Economy, 2001.)

According to Community Innovation Survey (CIS) carried out in Europe in 1993 among 2849 firms, lead-time advantages and secrecy are the most relied appropriation method. However, it is more probable that small firms rely more on secrecy for product innovations but no relationship between patenting and size has been observed for process innovations.[151]

Table 16 indicates the most important protection methods in European firms with fewer than 1250 employees, in various sectors; while Table 17 shows Relative importance of patents and secrecy by firm size for R&D-intensive firms in Europe.

TABLE 16: Most Important Protection Method in 2000 for Innovative European firms With Fewer Than 1250 Employees

	Food	Chemicals	Telecom equip.	Telecom services	Computer services
Patents	11%	40%	17%	3%	1%
Secrecy	25%	23%	24%	43%	19%
Lead times	38%	27%	47%	39%	31%
Other	26%	10%	12%	15%	49%

(Source: Arundel, The relative effectiveness of patents and secrecy for appropriation, Research Policy 30, 2001, pp. 611-624.)

According to Table 16, patent seems to be the most important protection method for chemicals sector by 40 % while in telecom equipment, lead time advantage is seen as the most important appropriation method. For other sectors, the importance of patents is quite low, especially for telecom services and computer services.

[151] Arundel, The relative effectiveness …p. 611.

TABLE 17 : Relative Importance of Patents and Secrecy by Firm Size for R&D Intensive Firms in Europe (in %) (R&D intensity > 10%)

		Product Innovations			Process Innovations		
No. of employees		Patents more important	Equal	Secrecy more important	Patents more important	Equal	Secrecy more important
1 –19	63	22.2	34.9	42.9	15.9	36.5	47.6
20-99	86	23.3	26.7	50.0	15.1	26.7	58.1
100-249	57	33.3	19.3	47.4	12.3	36.8	50.9
250-999	53	24.5	24.5	50.9	9.4	24.5	66.0
> 1000	40	32.5	30.0	37.5	22.5	17.5	60.0

(Source: Arundel, The relative effectiveness of patents and secrecy for appropriation, Research Policy 30, 2001, pp. 611-624.)

According to Table 17, the importance of patents for product innovations increases slightly in Europe with firm size upto medium-sized enterprises, and then decreases again as firm size increases. The percentage for considering secrecy more important for product innovations is around 50 % for firms of all size. The importance of secrecy is considered higher for process innovations by firms of all size, particularly by firms with more than 250 employees.

Figure 4 gives the percentage of R&D performing firms for each appropriation method and lead-time advantages seem more effective for both product and process innovations. Secrecy seems to be the second best appropriation method for product innovations and complexity is the second option for process innovations. Patents are the third best option for both product and process innovations.

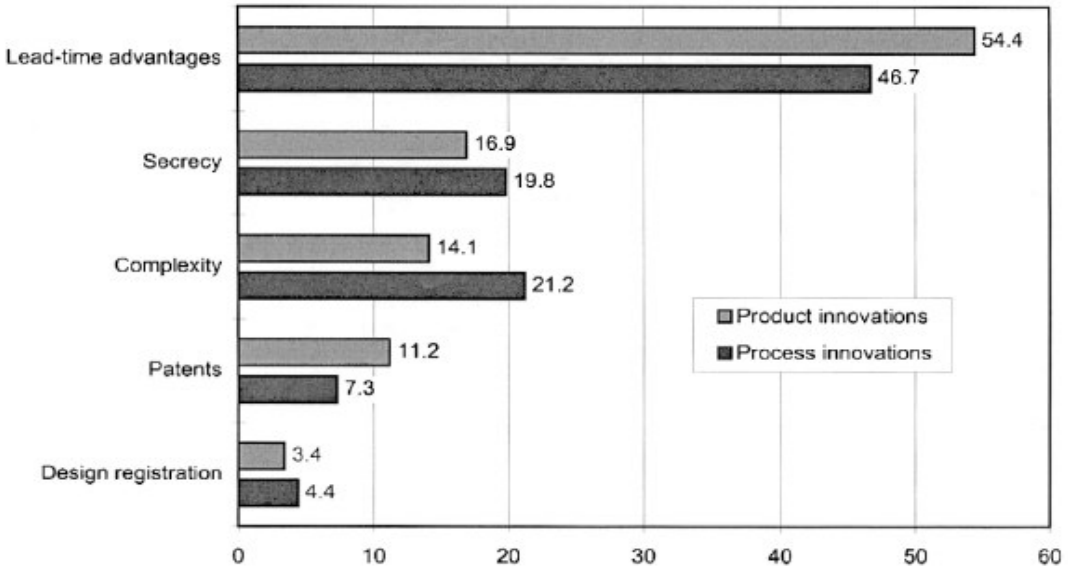

FIGURE 4: Percentage of R&D Performing Firms That Give Their Highest Rating to Each Appropriation Method

(Source: Arundel, The relative effectiveness of patents and secrecy for appropriation, Research Policy 30, 2001, pp. 611-624.)

No differentiation of firm size was shown in Figure 4; although it has been pointed out that there was very little variation with firm size. The breakdown of firm size is given in Tables 18 and 19 for R&D-performing and R&D-intensive firms.

TABLE 18: Relative Importance of Patents With Respect to Firm Size for R&D-Performing Firms (Standard Errors in Parenthesis)

Employees	N	Product innovations			Process innovations		
		Patents more important	Equal importance	Secrecy more important	Patents more important	Equal importance	Secrecy more important
< 19	183	17.5 (2.8)	38.3 (3.6)	44.3 (3.7)	10.4 (2.3)	40.4 (3.6)	49.2 (3.7)
20-49	386	17.6 (1.9)	23.6 (2.2)	58.8 (2.5)	12.4 (1.7)	27.5 (2.3)	60.1 (2.5)
50-99	452	23.0 (2.0)	28.5 (2.1)	48.5 (2.4)	11.1 (1.5)	37.4 (2.3)	51.5 (2.4)
100-249	668	20.7 (1.6)	28.0 (1.7)	51.3 (1.9)	11.8 (1.3)	35.9 (1.9)	52.2 (1.9)
250-499	479	20.5 (1.8)	30.1 (2.1)	49.5 (2.3)	12.3 (1.5)	29.6 (2.1)	58.0 (2.3)
500-999	319	24.5 (2.4)	24.8 (2.4)	50.8 (2.8)	9.7 (1.7)	23.2 (2.4)	67.1 (2.6)
1000-1999	186	23.7 (3.1)	33.9 (3.5)	42.5 (3.6)	10.8 (2.3)	30.6 (3.4)	58.6 (3.6)
> 2000	176	30.7 (3.5)	26.1 (3.3)	43.2 (3.7)	19.9 (3.0)	23.3 (3.2)	56.8 (3.7)

(Source: Arundel, The relative effectiveness of patents and secrecy for appropriation, Research Policy 30, 2001, pp. 611-624.)

TABLE 19: Relative Importance of Patents With Respect to Firm Size for R&D-Intensive Firms (Standard Errors in Parenthesis)

Employees	N	Product innovations			Process innovations		
		Patents more important	Equal importance	Secrecy more important	Patents more important	Equal importance	Secrecy more important
< 19	59	22.0 (5.4)	33.9 (6.2)	44.1 (6.6)	15.3 (4.7)	39.0 (6.4)	45.8 (6.5)
20-99	92	23.9 (4.5)	27.2 (4.7)	48.9 (5.2)	16.3 (3.9)	25.0 (4.5)	58.7 (5.2)
100-249	57	33.3 (6.3)	19.3 (5.3)	47.4 (6.7)	12.3 (4.4)	36.8 (6.4)	50.9 (6.7)
250-999	53	24.5 (6.0)	24.5 (6.0)	50.9 (6.9)	9.4 (4.1)	24.5 (6.0)	66.0 (6.6)
> 1000	40	32.5 (7.5)	30.0 (7.3)	37.5 (7.8)	22.5 (6.7)	17.5 (6.1)	60.0 (7.8)

(Source: Arundel, The relative effectiveness of patents and secrecy for appropriation, Research Policy 30, 2001, pp. 611-624.)

Table 18 indicates that among 183 firms with less than 19 employees, 17.5 % find patents more effective than secrecy for product innovations, 38.3 % give equal rating to both appropriation methods and 44.3 % prefer secrecy. Firms of all sizes regard secrecy more important than patents in both product and process innovations. However, Table 19 shows that R&D intense firms give higher score to patents than R&D performing firms, even in small firms, although secrecy has been given a higher rate. For both groups of firms, secrecy is much more credited for process innovations than for product innovations.

As for patents as a source of information, it has been underlined in the European Yearbook that the information stored in patent databases is underutilized especially by SMEs. Thus some countries introduced measures for restructuring their patent offices so that technological information contained in their database can actively be made use of.[152] Table 20 indicates the percentage of firms using patent database as a source of information.

TABLE 20: Percentage of Firms Using Patent Database as a Source of Information

	Fewer than 250 employees	**250 to 1250 employees**	**All respondent firms**
Germany	20.9	19.4	20.3
France	21.7	21.1	21.5
Italy	14.9	51.7	28.9
Netherlands	36.4	51.9	40.0
Denmark	10.9	28.6	15.8
Greece	11.8	13.3	12.0
Total	**20.3**	**32.6**	**23.9**

(Source: European Trend Chart on Innovation, European Yearbook of Innovation Indicators-2001)

As seen from Table 20, SMEs make lower use of patent databases as a source of information than big firms, with the exception of Germany and France. Nevertheless, the difference between small and large firms is not very remarkable for the latter two. The biggest difference between small firms and large firms in terms of patent database utilization is seen in Italy; 14.9 % and 51.7 % respectively.

Derwent study, surveying the use of the IP system by SMEs in the European Union, concludes that a minority of European SMEs file patent applications. According to the survey, the most widespread reasons for not patenting are that patents are not considered relevant to the line of business of the company, and the patent system is too costly and too complex. A recent study commissioned by WIPO on SMEs and the IP system in Norway, draws attention to the fact that small companies apply on average 20 times less often for

[152] European Trend Chart on Innovation...

patents than large enterprises and their success rate -in terms of being granted the patent- is significantly lower. A UK study concludes that small business owners place more emphasis on informal methods of protection of their intellectual property i.e., lead-time, relationships based on trust, limited information sharing, rather than on formal registered IP rights, often being unaware of the fact that confidential business information -or "trade secrets"-may also be protected under the laws of many countries.[153]

4.4 Situation in Turkey

According to national science and technology indicators which constitute of data such as scientist per 1000 workers, percentage of R&D expenditure in GNDP, R&D expenditure per person, Turkey ranks very low compared to EU, USA and Japan. Figures 5 and 6 show some of these indicators in OECD countries.

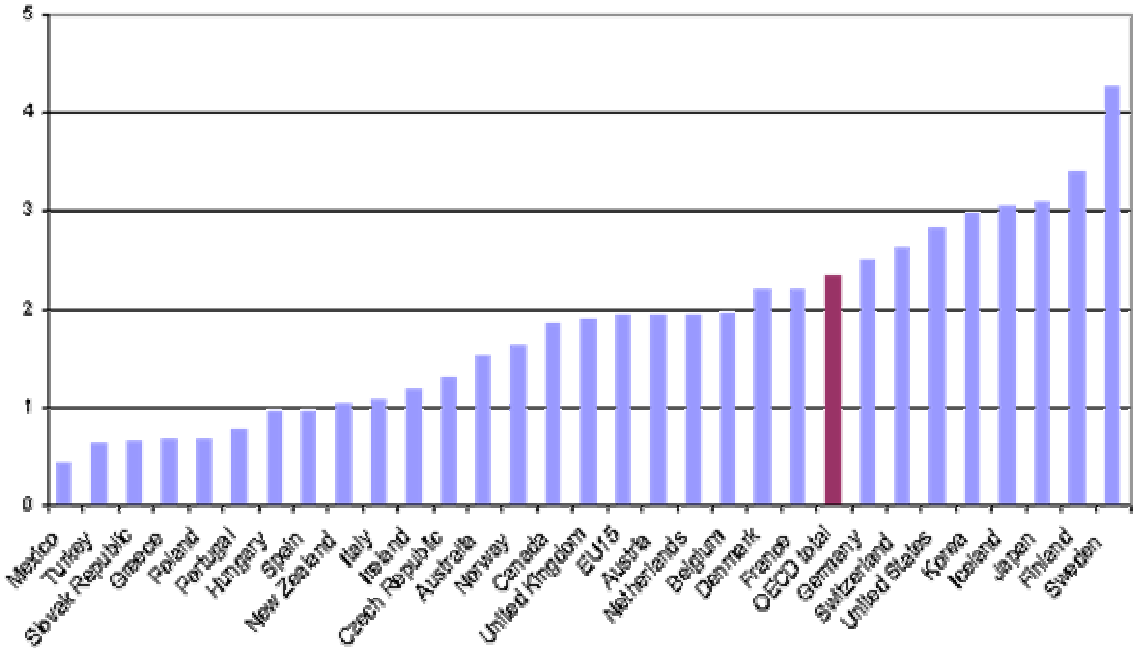

FIGURE 5: Gross Domestic Expenditure on R&D as a Percentage of GDP in OECD Countries in 2004

(Source: http://www.oecd.org/dataoecd/49/45/24236156.pdf, 15 May 2006)

As indicated in Figure 5, Turkey's R&D expenditure ranks quite low among OECD countries. It is observed as about 0.7 % of GDP, however policies intend to raise this percentage to 2 % by 2010. OECD Total is about 2.5 %, EU 15 slightly below 2 % and Sweden is the country with the highest amount of R&D expenditure with above 4 % of the GDP.

[153] Intellectual Property and Small and Medium Sized Enterprises…

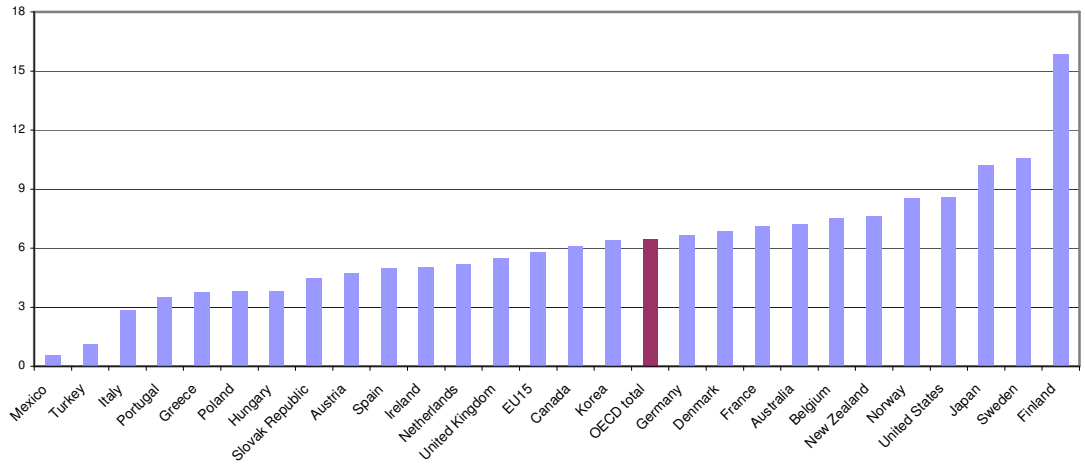

FIGURE 6: Total Researchers per Thousand Employment in OECD Countries in 2003 (Source: http://www.oecd.org/dataoecd/49/45/24236156.pdf, 15 May 2006)

Figure 6 shows the number of researchers per thousand employment, where the highest number of researchers belongs to Finland with about 16 researchers. OECD total is above 6, EU 15 about 6 and the number for Turkey is about 1.5.

Evaluation of Figures 5 and 6 indicates that Turkey ranks behind many OECD and EU countries in basic science and technology indicators. This low rate of R&D activities leads to low usage of IPR system by all firms in general and by the SMEs in particular.

Until recently, SME definition in Turkey was not in line with international definitions, particularly that of the EU. A regulation published in the Official Gazette dated 18 November 2005 and which was enforced on 18 May 2006, redefines SME's in line with EU definitions.

In the above mentioned regulation, micro enterprises are defined as the enterprises employing fewer than 10 employees with net annual sales profit or financial balance less than 1 million YTL; small scaled enterprises are defined as the enterprises employing fewer than 50 employees with net annual sales profit or financial balance less than 5 million YTL; and medium scaled enterprises are defined as the enterprises employing fewer than 250 employees with net annual sales profit or financial balance less than 25 million YTL.[154]

This harmonization of SME definition both nation-wide and with Europe, is expected to enable the implementation of proper policies for these enterprises. Nation-wide, a standard definition shall help consider more effective SME oriented policies which used to be complicated as different institutions used to adopt different definitions for these enterprises and thus one company would fit into a different size of enterprise for each institution like KOSGEB (Small and Medium Sized Industry Development Organization), HALKBANK (People's Bank of Turkey), TOSYÖV (Turkish Foundation for Small and Medium Business)

[154] Regulation About Definition, Qualifications and Classification of Small and Medium Scaled Enterprises, published in the Official Gazette dated 18 November 2005, numbered 25997, Article 5.

or TOBB (Turkish Union of Chambers and Stock Exchanges). As for harmonization with the EU definition, policies may help healthier economic integration with the EU.

In Turkey, SMEs represent 98 % of all enterprises, 76.6 % of total employment, 26.5 % of investments, 38 % of added value and 10 % of exports.[155] According to data obtained from KOSGEB, there are approximately 1,750,000 SMEs in Turkey, 250,000 of which are in manufacturing industry.[156] 65 % of these enterprises are situated outside organized industrial zones, small scale industry estates, technological development zones and free zones; which makes it difficult for KOSGEB to reach them. Financial credits utilized by the SMEs in Turkey are about 4 % of total credits, while this ratio is about 45 % in Europe.[157]

According to SME Strategy and Action Plan prepared by the State Planning Organization, a typical Turkish SME produces in traditional ways for internal market, but also has to compete with foreign firms at the internal market. Their technological capacity is far behind foreign counterparts and their productivity is also affected by this situation. Trade of items that are subject to intellectual property is also quite low.[158]

Turkey became a member of the EPC in 2000. However this does not guarantee an increase in scientific research nor in technological development level. On the contrary Turkish firms, especially the SME's had to face global competition while most of them are still producing in traditional methods. Besides, the lack of knowledge about the IP system makes their innovations stay unprotected against rivals.

There were approximately 22,000 patent applications in Turkey between the years 1993-2003, 80 % of which was foreign applications. US and German firms lead foreign application in Turkey. However, 22,000 patent applications are being filed in Japan in 15 days, in the USA in 20 days.[159]

The cost of patenting in Turkey is between 1119-1439 YTL, (829- 1000 USD) and that of utility model is approximately 289 YTL (214 USD). The cost of patenting, has decreased since TPE began carrying out patent examination process in 2005; before that Russian Patent Office was doing the research and the cost of patenting used to be more than 2000 YTL (1500 USD). The current cost of patenting is said to be one of the cheapest

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[155] CC Best Report, http://europa.eu.int/comm/enterprise_policy/enlargement/cc-best_directory/documents/sec_2001_2054_en.pdf

[156] Çolakoğlu, Mustafa, Speech made at the Panel titled "New Dimension in Competition, Patent, Trademark, Design" Ankara Chamber of Commerce, December 6, 2005.

[157] 1. KOBİ Kurultayı Odak Toplantı Kitapçığı, TOBB, Ankara, 2002.

[158] SME Strategy and Action Plan, State Planning Organization, January 2004, Ankara.

[159] Aygün, Sinan, Speech made at the opening of the Panel titled "New Dimension in Competition, Patent, Trademark, Design" Ankara Chamber of Commerce, December 6, 2005.

patenting costs in Europe.[160] As for fees for industrial design, considering three colored designs, the fee is 420 YTL (310 USD). To set an example, some fees for industrial design application are given in Table 21.

TABLE 21 : Fees for Industrial Design Applications in Turkey

NO. OF DESIGNS	NO. OF REPRESENTATIONS	COLOR	FEE (YTL)	FEE (USD)
1	1	BLACK AND WHITE	190	140
1	1	COLORED	240	178
3	3	BLACK AND WHITE	320	237
3	3	COLORED	420	311
5	5	BLACK AND WHITE	450	333
5	5	COLORED	600	444

(Source: TPE)

The fees are given according to the rearrangement published on January 5, 2006 to which VAT and duties were later added by TPE. 1 USD has been calculated to equal 1.35 YTL for conversions.

The fee for trademark register in the USA varies between 1660-1890 USD, 1206 USD in Canada, 1900 USD in China, 1280 in Benelux.[161] Patent applications fee for PCT is 3500-4500 Swiss Francs (2900-3750 USD) depending on the countries selected, number of pages and other items. The fee for industrial design protection in Turkey is between 200-700 YTL (148-518 USD) for 1-10 designs; the fee is between 1435-5386 Swiss Francs (1200-4500 USD) for the same number of designs for international applications in the scope of The Hague Agreement. Attorney expenses are not given in these figures. 1 Swiss Franc has been calculated to equal 1.20 YTL for conversions.

According to the SME Guide prepared by KOSGEB and published by TOBB, firms prefer to keep their innovations as trade secrets. However, if their invention can be disclosed by reverse engineering, they find it more appropriate to get patent protection. In case they apply for a patent for a product which cannot be obtained by reverse engineering, firms will have disclosed their invention through patent documents. [162]

Trademark registration in Turkey seems to be much more often utilized than other means of intellectual property. The reason for such a tendency lies in policies and pronunciations of the government, chambers of trade and commerce, institutions aiming at promoting production and technology. These institutions, mostly the most popular ones often refer to the benefits of "being a trademark". They never emphasize the importance of

[160] Başer, Barış Cihan, presentation made at the Panel titled "New Dimension in Competition, Patent, Trademark, Design" Ankara Chamber of Commerce, December 6, 2005.

[161] Tiryakioğlu, Bilgin et. Al. KOBİ'ler İçin Fikri ve Sınai Mülkiyet Hakları, Türkiye Odalar ve Borsalar Birliği, October 2005.

[162] Çolakoğlu, Mustafa H., KOBİ Rehberi, KOSGEB Başkanlığı, TOBB Genel Yayını, 2002.

technological advancement and patent protection. Owning a trademark is over-emphasized while no declarations about patent, utility model or industrial design protection are heard publicly.

There is little research about the utilization of the IPR system by Turkish SME's. But there are efforts going on to encourage them about the use of the system. A multiannual programme for SME's was launched by the EU in order to improve the competitiveness of the SMEs. Turkey participates in the programme through KOSGEB. "ITTE-Improving Institutions for Technology Transfer to Enterprises" is a study group within this programme aiming at a better functioning of Technology Transfer Institutes where patent granting of products obtained as a result of R&D activities, marketing of these products and consultancy for spin-off firms are provided.[163]. Studies are also being carried out by KOSGEB in order to increase the innovative capacity of the SMEs, and establishment of Technoparks (technology development zones, TDZ's) by the Ministry of Industry and Trade is considered as one of the important targets. Although these zones do not directly target SMEs, they may be considered as an incentive for them to innovate.

Another field of work is the Framework Programmes of the EU which aim at developing the science and technology capacity in EU countries and innovation programme is one of the significant parts of the programme. Another means of assistance, innovation relay centers (IRCs) are established in order to promote innovation and technology transfer. Turkey has participated in IRC network during Sixth Framework Programme and IRC Anatolia was founded with the participation of KOSGEB, METU Technopolis and Ankara Chamber of Commerce. Later IRC Ege was founded with the same goals.

Candidate countries for the EU were invited to participate in the elaboration of a report named "Candidate Countries Best Report" that would mirror the "Report on the Implementation of the Action Plan to Promote Entrepreneurship and Competitiveness". CC Best Report was prepared with the participation of candidate countries. Among the areas covered by the CC Best Report, "Better use of patents by SME's" is a topic to be studied.

Organized industrial zones (OIZ) and small scale industry estates (SSIE) are two main types of industrial areas in Turkey where SMEs are engaged in production activities. SSIEs are mostly for small scale producers and manufacturers while OIZs are mainly for medium scaled industrialists. Both types of zones have their own management however these managing bodies do not provide assistance in terms of IPR. Nevertheless, KOSGEB has offices in most of these zones and provides assistance to SMEs. Some managements offer assistance beyond management issues but these examples are very few.

Another type of industrial area in Turkey is technology development zones (TDZs) which are being implemented in order to promote new technologies. There are 19 technology development zones that provide some incentives and exemptions for R&D

[163] Çolakoğlu, Mustafa, H., Teknoloji Geliştirme ve Yenilik Destekleri Rehberi, TOBB, February 2005, Ankara.

activities of companies. The administrator company provides training, test, calibration and quality services as well as assistance for trademark and patent registration.[164] About 320 firms are established in these zones with a total of 2253 R&D staff. Total number of granted patents for the firms in these zones is 488.[165] Sectoral distribution of these patents is given in Table 22.

TABLE 22: Patents Granted For Firms Situated in TDZs

		SECTORAL DISTRIBUTION OF PATENTS OBTAINED						
NAME OF TDZ	**Total Number of Firms**	IT	Defense	Electronics	Telecommunication	Advanced Materials	Medicine	Others
METU	**135**	**58**	**28**	**14**	**3**	**1**	**1**	**16**
HACETTEPE	**24**	**14**	**-**	**3**	**-**	**-**	**1**	**6**
GOSB	**13**	**12**	**-**	**-**	**-**	**-**	**-**	**1**
TÜBİTAK-MAM	**23**	**76**	**-**	-	**-**	**26**	**-**	**-**
İTÜ	**27**	**28**	**-**	**6**	**-**	**-**	**-**	**1**
İZMİR TGB	**6**	**11**	**-**	**-**	**-**	**-**	**-**	**1**
BİLKENT ANKARA	**84**	**86**	**10**	**30**	**16**	**5**	**3**	**7**
ESKİŞEHİR	**4**	**-**	**-**	**-**	**-**	**7**	**-**	**-**
KONYA	**6**	**10**	**1**	**1**	**-**	**1**	**-**	**4**
TOTAL	**322**	**295**	**39**	**54**	**19**	**40**	**5**	**36**

(Source: Ministry of Industry and Trade, December 2005))

Research related to the utilization of IPR by Turkish SMEs is scarce; much scarcer than that by European SMEs. Among the scarce material, a study that can shed light on the issue is a thesis titled “The European Patent System and Turkey’s Integration: The Role of Small and Medium Sized Enterprises,” submitted to Middle East Technical University by Yeşiltaş in 2005. The thesis includes a field study conducted among 136 small and medium-scaled firms in Ankara about their utilization of the IPR system. During the study, former definition of SME by KOSGEB was adopted, so the interviews were made with the firms who employed upto 150 people.

Among 136 firms examined, 25 of them are from METU Technopark which is a technology development zone (TDZ), 61 from OSTİM, an organized industrial zone

[164] Ibid.

[165] Figures as of December 2005, Ministry of Industry and Trade of Turkey.

composed mainly of small scaled enterprises and 50 from Ankara Organized Industrial Zone in Sincan, composed mainly of medium scaled enterprises. The interviewed firms were active in manufacturing industry, mainly from the fields of construction, electronics, mechanics, chemistry, automotive, furniture and textile.

Among the 136 firms examined, 74 % of them declared to have engaged in R&D activities. Reasons of not engaging in R&D activities were reported as insufficiency of financial resources by 82.9 %. Other reasons were reported as absence of qualified personnel, insufficiency of knowledge and no need observed for R&D.[166] (Figure 7 and Table 23)

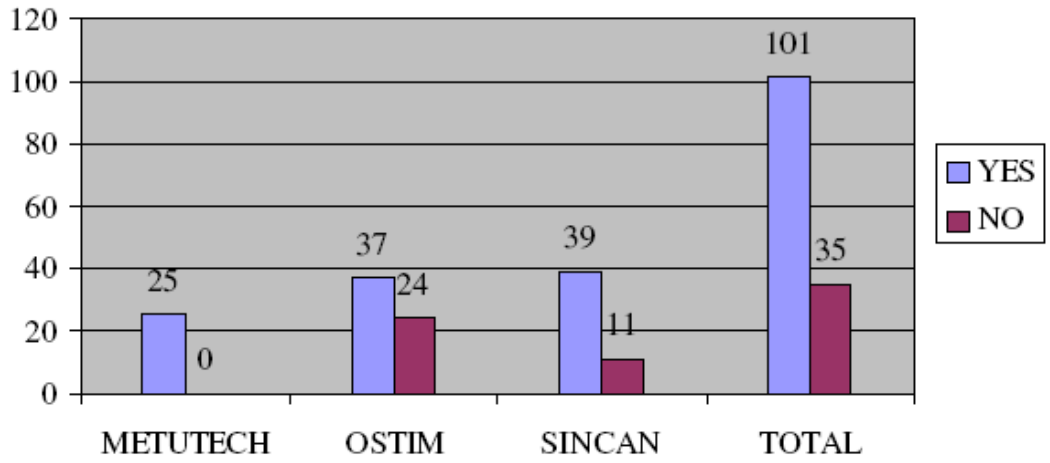

FIGURE 7: Distribution of Firms According To Whether They Undertake R&D

(Source: Yeşiltaş_The European Patent System and Turkey's Integration: The Role of Small and Medium-Sized Enterprises, Thesis submitted to Middle East Technical University, Ankara, July 2005.)

TABLE 23: Distribution of Firms According To Reasons for not Engaging in R&D

Reasons	METUTECH	OSTİM	SİNCAN	TOTAL
Insufficiency of knowledge	-	54.2	36.4	48.6
Insufficiency of Financial Resources	-	87.5	72.7	82.9
It takes a long time	-	12.5	18.2	14.3
Absence of qualified personnel	-	70.8	63.6	68.6
No need for R&D engagement	-	45.8	27.3	40.0

(Source: Yeşiltaş_The European Patent System and Turkey's Integration: The Role of Small and Medium-Sized Enterprises, Thesis submitted to Middle East Technical University, Ankara, July 2005.)

Among the firms who declared that they carry out R&D activities, only 45.5 % of them have a distinct R&D department. In fact almost 55 % of them practiced experimental development i.e. experimenting on an already existing product and applied research. It was

[166] Yeşiltaş.

also found to be widespread among the firms to adapt an already existing technology, without even searching whether it is a protected intellectual property.

As for participation in R&D support programmes, there is about 80 % of non attendance. Again the reasons were mainly reported as length of bureaucratic procedures (by 46 %), insufficiency of information (by 40 %) and absence of qualified personnel (by 37.5 %). A considerable number of firms also complained about their unanswered applications filed in KOSGEB.[167]

It should be noted that all the firms interviewed were not homogeneous. Firms in METU Technopark were more conscious about R&D issues, opposite to those situated in OSTİM. Likewise, in terms of university partnership, 21 firms out of 25 have close relationships with the university in METUTECH while only 19 out of 61 firms in OSTİM do. This number is 36 out of 50 firms in Ankara Organized Industrial Zone. Authorities of the firms with loose or no relationships with the universities complained about the indifference of university administrations.[168]

Although R&D is seen as an important factor for innovation, not all technological innovations come out as a result of R&D activities. A survey by DİE shows that most innovations were made by firms that did not have an R&D department. A majority of innovations come out during production process.[169]. Especially SME's are capable of such innovations due to their flexible structures.

The research by Yeşiltaş lays out the fact that the firms' awareness of the IP system is low. They are more familiar with the concepts of patent and trademark than other aspects of IPRs, i.e., utility model and industrial design. This awareness however, is in conceptual terms and patent and trademark are often confused.[170]

When asked whether they have filed an application for patent or utility model protection, the answer was negative with a high proportion (114 firms out of 136 in total), (Figure 8).

[167] Ibid., p. 84.

[168] Ibid., p. 91.

[169] Taymaz, Erol, Ulusal Yenilik Sistemi, TÜBİTAK, TTGV, DİE, Ankara March 2001.

[170] Yeşiltaş, p. 93.

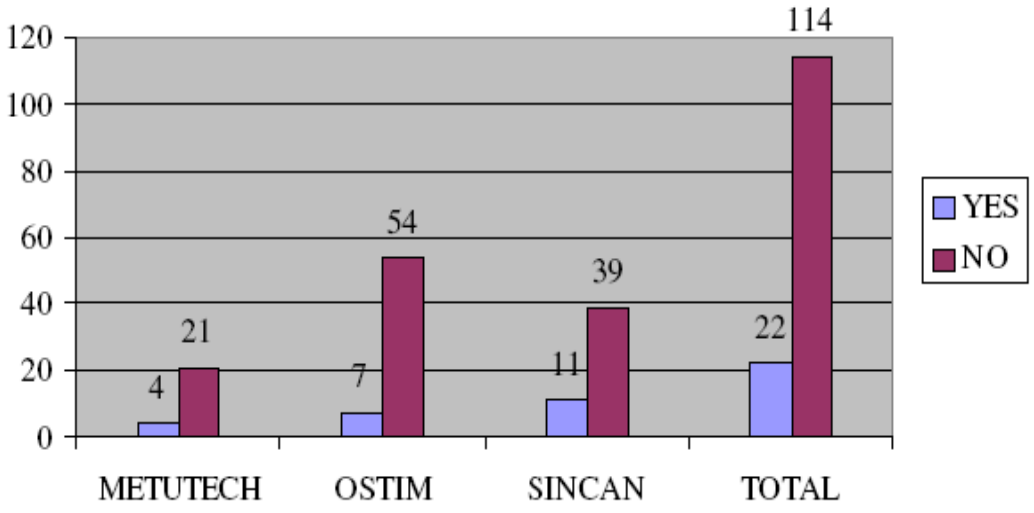

FIGURE 8: Distribution of Firms According to whether They Have Made Patent/Utility Model Application

(Source: Yeşiltaş The European Patent System and Turkey's Integration: The Role of Small and Medium-Sized Enterprises, Thesis submitted to Middle East Technical University, Ankara, July 2005.)

On the other hand, the answer to the question whether they filed an application for a trademark, the firms' answer was "yes" to a great extent (87 out of 136 firms). This result is natural as trademark is always emphasized in policies and public hearings while other fields of IPRs are not stressed at all.

Most of the firms interviewed (102 out of 136) know about IP supports of KOSGEB, however none of them made use of the system. Main reason was reported as the support being paid after grant and this was a burden firms could not afford.[171]

Industrial design application is even lower than patent applications; 17 out of 136 firms. This is partly because the field of work of the firms studied did not cover industrial design, and partly because of the understanding that design could not be an issue of industrial property. The lack of knowledge about this field is the main reason for under-utilization. Even firms in furniture sector were unaware of the benefits of industrial design protection for their original designs.[172]

One outstanding point is that, firms who filed patent or utility model application did this in national level; no PCT or European applications were made.[173] This is an indication of the low capacity of the SME's in Turkey. The reasons for not applying for patent or utility model protection are given in Table 24.

[171] Ibid., p. 106.

[172] Ibid., p. 102.

[173] Ibid., p. 95.

TABLE 24: Distribution of Firms According to Reasons for not Making Patent/Utility Model Application

THE REASONS	METUTECH	OSTİM	SİNCAN	TOTAL
Insufficiency of knowledge	-	70.4	30.8	43.9
Considering patent protection as irrelevant	14.3	85.2	56.4	62.3
High Costs	87.5	29.6	69.2	53.5
Length of procedures	76.2	25.9	64.1	48.2
Thinking that no sufficient protection is provided	80.9	27.8	66.7	50.9

(Source: Yeşiltaş The European Patent System and Turkey's Integration: The Role of Small and Medium-Sized Enterprises, Thesis submitted to Middle East Technical University, Ankara, July 2005.)

While evaluating Table 24, the data obtained from METUTECH and that obtained from OSTİM and Sincan have to be distinguished. As firms in METU TDZ represent firms more engaged with technology and more aware of IPR system, their reasons are considerably different from the firms situated in the other two OIZs. The main reasons for the latter two OIZs are considering patent protection as irrelevant to their business (by 85 and 56 %) and insufficiency of knowledge (by 70 and 30 %). On the other hand the main reasons for not applying for patent protection among firms in METU are high costs (by 87 %), thinking no sufficient protection is provided (by 80 %) and length of grant procedures (by 76 %). Thus, the reasons vary according to the technological capacity of the firms and policies should be considered accordingly.

Another study by Morgül points out the reasons why SME's do not make much use of the IPR system internationally as:

- High fees for international applications,
- Lack of harmonization at the European Community level,
- Long duration between application and grant,
- High rate of imitation and piracy within the Community.[174]

Although almost 80 % of global technical information exists in patent documents, SMEs do not make enough use of this information; publication of patent documents is not seen as a source of information, rather the firms are skeptical about these publications as they fear their invention might be copied.[175] Also, as some of these firms are themselves infringers, they do not trust patent system. Firms do not make use of patent database although majority of them have access to internet. But companies that have applied for an IP protection make use of patent documents more. Others are not even aware of patent database as a source of information.

[174] Morgül,

[175] Yeşiltaş. p. 100.

Firms that have applied for a kind of IP protection were asked to report the difficulties they faced during or after grant procedure. Figure 9 indicates the main difficulties faced.

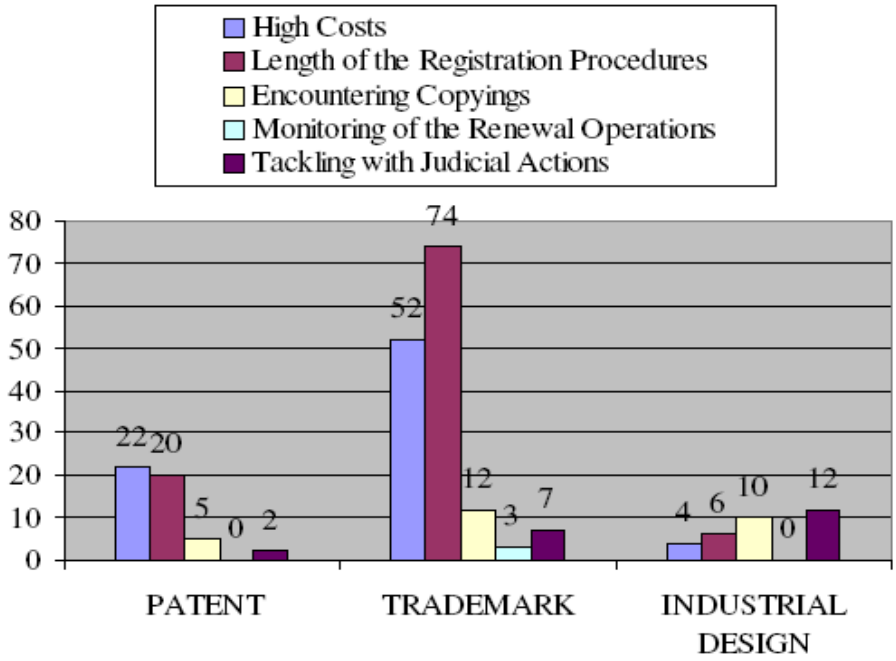

FIGURE 9: Distribution of Firms According to Difficulties They Encountered During or After Registration Procedures

n (patent)=22, n(trademark)=87, n(industrial design)=17

(Source: Yeşiltaş The European Patent System and Turkey's Integration: The Role of Small and Medium-Sized Enterprises, Thesis submitted to Middle East Technical University, Ankara, July 2005.)

As seen from Figure 10 the most outstanding difficulties are the length of registration process and high costs. Firms seemed to be unaware of benefits of IP protection and therefore they were not engaged in licensing, contracts and commercialization of their products. This made them not see the benefits of the IP system.

SME development project was launched by TOBB (Turkish Union of Chambers and Stock Exchanges) in 2002 and the situation of the SMEs was presented in the Book of the Focal Group Meeting for SMEs, 1. Problems and solution proposals were presented in the book and problems concerning the IPR utilization of the SMEs are as follows:[176]

- Weakness of technological competence,
- Lack of coordination of institutions,
- Insufficiency of credits and incentives,
- Indifference of the SMEs for the services,
- Inadequacy of public institutions to access SMEs,

[176] 1. KOBİ Kurultayı Odak Toplantı Kitapçığı.

- Entrepreneurship and innovation not being encouraged,
- Lack of bridging between SMEs and innovators,
- Prejudice that R&D activities would be costly,
- Lack of coordination between TPE and universities,
- Lack of qualified staff,
- Copying of technology rather than creation,
- Low level of returning questionnaires from the SMEs which makes it difficult to define their exact situation, (which was one of the difficulties of this thesis as well),
- Insufficiency of training for the SMEs about IPR system,
- IPR protection being costly,
- Insufficiency of IPR incentives both in quality and in quantity.

Solutions for the above-mentioned problems were presented in the same book. The solution proposals are as follows:[177]

- Creation of an environment, such as an association of inventors, where the SMEs and innovators can work together,
- Coordination between TOBB and TPE to be provided,
- To have IPR classes in the universities,
- Graduate and post-graduate programmes about technology management to be launched at universities,
- Lowering grant and application costs,
- Informing the SMEs about the SME web site of WIPO,
- Providing incentives for employment of qualified staff,
- Providing better financial assistance for IPRs.

4.5 Concluding Remarks

Although technological development and the IPR system are placed at the heart of economic development today, and the importance of SMEs for the economy is being emphasized more and more, policies fall short of encouraging SMEs to patent their innovations. Research results indicate under-utilization of the IPR system by the SMEs in most of the countries. However, there are examples from various countries where SMEs contributed to technological development thanks to the IPR system. On the other hand, they face some difficulties in protecting their innovations from infringement.

According to research results, the IPR utilization by the SMEs in the USA seems higher than by European SMEs. Still, secrecy and lead-time advantage are perceived by the SMEs as more efficient than patents, depending on the sector. Process innovations are

[177] Ibid.

patented even less than product innovations and for those, secrecy is seen as the most effective appropriation method.

Scarce research carried out in Turkey indicates even much less IPR utilization by the SMEs. Firms are more familiar with the concepts of patent and trademark than other IPR aspects. Although majority of the firms carry out R&D activities, they do not apply for IPR protection for their innovations and main reasons for not applying are reported as lack of knowledge and thinking that patent protection is irrelevant to their innovation, again rising from unawareness.

Research results present different reasons for under-utilization of the IPR system by European and Turkish SMEs. High costs seem to be the dominating reason abroad while lack of awareness is the primary issue for Turkish SMEs. However, high costs are pronounced often too by Turkish SMEs.

Solution proposals for the problems of the Turkish SMEs regarding IPRs are presented as building awareness, creation of a more favourable environment for the SMEs to innovate, establishment of coordination between related institutions, better financial assistance and decreasing the cost of patenting.

Another study has been carried out within the scope of this thesis to help lay out where Turkish SMEs stand in IPR regimes. The findings of the study are given in the next section.

CHAPTER V

FIELD STUDY ABOUT IPR UTILIZATION BY THE SMEs IN TURKEY

Field study conducted within the scope of this thesis is an essential part of the study. A picture of what research has been done upto this day about the IPR utilization of the SMEs both worldwide and in Turkey, has been presented in previous chapters. It is now intended to take the issue one step forward with another field study among the SMEs in Turkey; among the firms established within organized industrial zones (OIZs).

It was tried to pick up the OIZs from various regions of Turkey to be able to present the existing situation as close to reality as possible. With that intention, a total of 86 firms were studied; 85 firms in 12 OIZs and one firm was interviewed outside the OIZ in Ankara. The OIZs where the study was conducted are Adana, Ankara I, Ankara İvedik, Bursa, Çorum, Eskişehir, Gaziantep, Giresun, Malatya, Manisa, Trabzon and Van OIZs. A map showing the cities where the interrogated OIZs are situated is given in Appendix A.

Recent SME definition in Turkey involves both the number of employees and annual turnover of the firms. In order to stick to that definition, both parameters were questioned. However, since most firms did not give information about their annual turnover, classification had to be made according to the number of employees of the surveyed firms. In addition to this, the situation of some firms contradicted with the SME definition in comparison of the number of employees and annual turnover. Some firms reported less or more annual turnover with respect to the number of employees. For example according to the recent SME definition, a small scaled firm is the one that employs 10-49 people with annual turnover upto 5,000,000 YTL. However, one firm with 30 employees reported annual turnover of 40 million YTL which is a lot more than that of a firm employing 50-250 people. The reverse was also observed; a medium-sized firm is defined as the one with 50-250 employees and one of them with 138 employees reported annual turnover of 6.6 million YTL. About 15 of the firms had such a situation.

Among the firms interviewed, 14 of them had more than 250 employees. Those firms were interviewed in order to be able to make a comparison among the IPR utilization of firms of different size. It was tried to have an even distribution of the firms in terms of scale but the fact that the questionnaires filled in were fewer than expected, limited that intension. Majority of firms were of small-scale with 38 % and 14 % of the firms were of micro-scale. The firms surveyed are given in Table 25 according to the number of employees.

TABLE 25: Number of Employees in the Firms Interviewed

No. of Employees	Total no. of firms	Percentage
1-9	12	13.95
10-49	33	38.37
50-250	22	25.60
>250	14	16.28
Not declared	5	5.80
TOTAL	**86**	**100**

5.1 The Objective and the Methodology of the Field Study

The main objective of the field study was to glimpse an idea of the utilization of the IPR system by Turkish SMEs. Since OIZs are areas where small and medium scaled enterprises are situated together, it was considered to be more convenient to conduct the study in those zones where results from all over Turkey could be gathered easily and in relatively short time.

A questionnaire was submitted to OIZ administrations and they were asked to have those questionnaires filled in by the enterprises situated in their zones. The questionnaires were sent to 24 OIZs, assuming at least 10 firms from each OIZ could fill in and return them. The OIZs were selected where firms that fit in the SME definition were situated and evenness was tried to be achieved in terms of regional distribution.

However, the questionnaires did not return as soon as they were expected to. Many phone calls had to be made to ensure returning of the forms, but often it was the same complaint from OIZ administrations that the entrepreneurs were tired of questionnaires. For these reasons, not all the OIZ administrations could send back the forms and those who did, could not find ten firms to fill them in. Three OIZs had 11 firms to fill in the questionnaires and only two returned from one OIZ. The average number of questionnaires filled in by 12 OIZs is 7. Table 26 indicates the number of firms surveyed by OIZ.

TABLE 26: Number of Participant Firms by OIZ

Name of the OIZ	No.of Participant Firms
Adana	**3**
Ankara I	**11**
Ankara İvedik	**7**
Bursa	**7**
Çorum	**11**
Eskişehir	**9**
Gaziantep	**2**
Giresun	**4**
Malatya	**11**
Manisa	**5**
Trabzon	**8**
Van	**7**
Outside OIZ (Ankara)	**1**
TOTAL	**86**

Questionnaires thus filled in were returned by ordinary mail as many firms found it more appropriate to fill them in manually. Some of the firms were interviewed personally in order to be able to find some answers during casual conversation. One firm outside the OIZ was also interviewed for it was a micro enterprise whose owner was known personally.

The questionnaire was composed of 36 questions interrogating the R&D capabilities of the firm, the firm's awareness about the IPR system and related institutions, whether they developed a new product, process or design, whether they applied for IPR protection and if they did what difficulties they faced before, during or after grant. The firms were also asked about law-suits if they had any, any possible problems with patent attorneys if they hired one, whether they had license agreements after grant, whether they made use of patent data base and whether they heard about and/or made use of IPR supports of various institutions. The questionnaire is given in Appendices B and C both in English and in Turkish.

The sectors that the participant firms were engaged in are presented in Table 27.

TABLE 27: The Sectors of the Participant Firms

SECTOR	NO.OF FIRMS
Iron and steel	2
Metal industry	2
Car spare parts	7
Boilers	1
Electrical equipment	1
Electrical equipment for cars	2
Electronics	1
Industrial kitchen	1
Furniture	3
Plastic	5
Food	7
Cement and mining	1
Machinery	14
Construction machines	1
Tapes for printers and fax machines	1
Medical equipment	2
Nail and wire	1
Textile	13
Animal fodder	2
Fuel	4
Oil	1
Chemistry	1
White goods	2
Ventilators and fans	1
Construction materials	2
Software	2
Shoes	1
Forestry products	1
Packaging	1
Solar heating systems	1
Energy production	1
Did not declare	1
TOTAL	**86**

As seen from Table 27, the sector where most of the firms functioned are machinery and textile, 16.28 % and 15.12 % respectively. Food industry and car spare parts follow as

the third biggest share with 8.14 %. However, the answers to the questionnaire were not homogeneous by sector and sectoral evaluation for IPR utilization could not be provided.

The questionnaires were analyzed in terms of R&D capabilities of firms, whether they are familiar with and make use of the IPR system and whether they are informed about IPR supports and if ever made use of these supports.

5.2 R&D Capabilities of Participant Firms

As presented by Table 28, out of 86 firms interviewed 52 (60.5 %) of them declared to be carrying out R&D activities. Out of these 52 firms, only 29 (33.72 %) of them had a separate R&D department.

TABLE 28: Number of Firms According to R&D Capabilities

No. of firms carrying out R&D		**No. of firms not carrying out R&D**
52		**34**
With R&D Dept.	**Without R&D Dept.**	
29	**23**	
TOTAL		**86**

All of the participant firms had access to internet except one. 12 of them had access through a public computer but the rest had access of their own. 4 of the firms did not declare whether they had access to the internet or not.

48 (55.81 %) of the firms reported to have developed a product, process or a design while 38 of them did not develop any of those. The ones who developed a product were not necessarily R&D performers. Only 21 (43.75 %) of 48 inventions came out as a result of R&D.

R&D capabilities and development of a new product, process or design of the participant firms according to firm size are given in Table 29. Again, some firms who did not undertake R&D reported to have developed a new product, process or design.

TABLE 29: R&D Capabilities According to Firm Size

No. of Employees	**Total no. of firms**	**Carrying out R&D**	**Developed new prod.**
1-9	12 (13.95 %)	8 (66.7 %)	8 (66.7 %)
10-49	33 (38.37 %)	18 (54.5 %)	19 (57.6 %)
50-250	22 (25.60 %)	12 (59 %)	9 (40.9 %)
>250	14 (16.28 %)	13 (92.9 %)	11 (78.6 %)
Not declared	5 (5.80 %)	1 (20 %)	1 (20 %)
TOTAL	**86 (100 %)**	**52 (60.5 %)**	**48 (55.8 %)**

For micro enterprises with 1-9 employees, the rate of being engaged in R&D activities seems the highest except for large enterprises; the former with 66.7 % and the latter with 92.9 %. Micro enterprises similarly seem to have developed new products in a higher percentage (66.7 %) than small or medium-sized ones (57.6 % and 40.9 % respectively); this can be due to the fact that software or electronics sector was common in the micro enterprises interviewed. The percentage of developing new products is the highest for large enterprises with more than 250 employees (78.6 %).

In total, 60.5 % of the 86 firms interviewed reported to carry out R&D activities and 55.8 % of them reported to have developed a new product, process or design, and these firms were not necessarily the R&D performers.

5.3 Relationship of the Participant Firms with IPRs

The second part of the questionnaire aimed at finding out the level of awareness about IPRs and problems encountered if IPR system was applied for.

About 81.4 % of the firms interviewed claimed to know about the field of study of TPE; only 16 of them had no idea about the Institution. The situation was not as bright as that when it came to international patent offices; only 27 (31.40 %) of the firms had an idea of the task of EPO and 18 (21 %) of them about WIPO. The rest had no idea about the function of these organizations. Here firms in Bursa seemed more informed about these international organizations. However, firms in some provinces presented a surprise as their information about the IPR system. The most outstanding province was Giresun where all of the four participant firms declared to be informed about the IPR system, to have developed a new product and granted IP protection for their invention. One of the firms in Giresun complained about the situation that the banks did not accept IPRs as guarantee. Table 30 indicates acquaintance of the firms with IPR institutions.

TABLE 30: Number and Percentage of Firms Acquainted with IPR Institutions

	Knows TPE	**Knows EPO**	**Knows WIPO**
No. of Firms	70	27	18
Percentage	81.40	31.40	21

As for familiarity with fields of IPRs, firms seemed more familiar with patent and trademark; utility model followed them. Industrial design was the field the least known. The percentage of familiarity of the firms with patents was 79 %, trademark 76.74 %, utility model 48.84 % and industrial design 46.51 %. Despite the fact that most of the firms claimed to know about the fields of IPRs, only 14 of the firms (16.28 %) could explain what each method of protection means. 3 of the firms heard neither of these protection methods. The

number of firms who heard about each appropriation method is indicated at Table 31 and in Figure 10.

TABLE 31: Number of Firms Having Heard About Each Field of IPR
(Multiple answers for each firm is possible)

IPR Protection Type	Patent	Utility Model	Trademark	Industrial Design	Heard none
No. of firms with an idea	68 (79.0 %)	42 (48.84 %)	66 (76.74 %)	40 (46.51%)	3 (3.49 %)

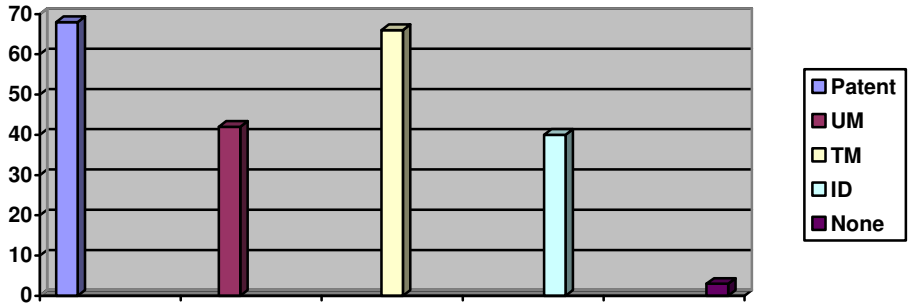

FIGURE 10: Number of Firms Having Heard About Each Field of IPR

The field of industrial design was not known even by the firms in textile or shoe design and production sector. One firm in electronics sector declared that ID protection was not fair. Utility model, which is said to fit the needs of the SMEs, is far less known than expected.

The firms were asked if they knew about each field of IPR. The responses were cross-checked with other answers and a general conclusion was reached on the real IPR knowledge of the firms. This was done because although some firms declared to know about IPRs, later questions showed that they knew only about trademark. The breakdown of IPR knowledge thus calculated according to firm size is given in Table 32.

TABLE 32: The Breakdown of IPR Knowledge According to Firm Size

No. of employees	Total no. of firms	Knowing IPRs	Percentage
1-9	12	6	50
10-49	33	19	58
50-250	22	11	50
>250	14	11	79
Not declared	5	-	0
TOTAL	86	47	55

It can be observed from Table 32 that 55 % of all firms really have some idea about the IPRs. Big firms had the largest awareness about the IPRs (79 %). Small scaled firms had the second largest IPR awareness percentage (58 %) and micro-scaled (50 %) and medium scaled firms followed (50 %). Thus, no result could be reached about the relationship between the firm size and the level of awareness.

Among 48 firms who reported to have developed a product, process or a design, only 16 of them applied for IPR protection. 5 of these firms had international application as well. Among the reasons stated, why most of the firms did not apply for an IPR protection, the outstanding one is lack of information about the issue. The second reason was stated as application being costly, the procedures being complicated and "others" where thinking that the product was not so special and the fact that the main firm did the applications, were leading. In the latter, the surveyed firm produced spare parts for an international company and the foreign firm filed all the IPR applications. The fourth most declared reasons for not filing an application was that and they took too long. Considering that 48 firms developed a new product, process or design and only 16 of them filed an application for IP protection, breakdown of reasons for not applying was calculated accordingly. Percentage distribution of these reasons is given in Table 33 and reasons for not applying for IP protection is given in Figure 11. It should be noted here that not all the firms which did not apply for IP protection for their innovation, stated reasons for that.

TABLE 33: Reasons for Not Applying for IP Protection

<table>
<tr><th>Developed a new prod.</th><th>Applied for IPR</th><th colspan="2">Not applied for IPR</th></tr>
<tr><td rowspan="7">48</td><td rowspan="7">• 16 (33 %)
• 5 international applications (10.42 %)</td><td colspan="2">32 (66.7 %)</td></tr>
<tr><td>Reasons</td><td>No. of firms</td></tr>
<tr><td>Lack of knowledge</td><td>12 (37.5 %)</td></tr>
<tr><td>Procedures complicated</td><td>10 (31.25 %)</td></tr>
<tr><td>Procedures too long</td><td>8 (25 %)</td></tr>
<tr><td>Costly</td><td>10 (31.25 %)</td></tr>
<tr><td>Other</td><td>10 (31.25 %)</td></tr>
</table>

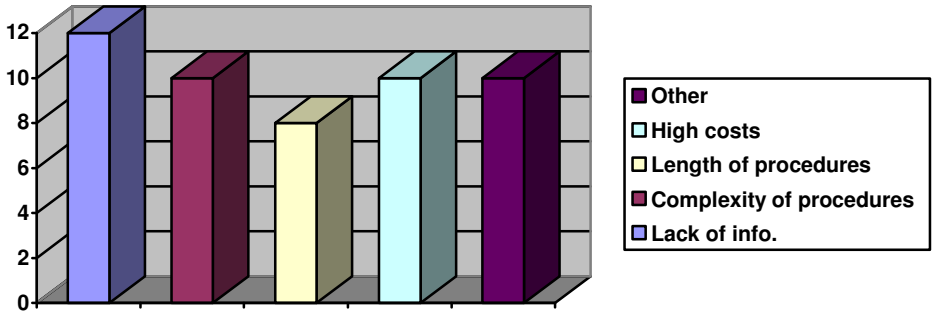

FIGURE 11: Reasons for not applying for an IP Protection

The number of firms that developed a product, process or design, whether they applied for IP protection and whether they hired a patent attorney is given with respect to firm size in Table 34.

TABLE 34: IP Application and Attorney Hiring of Firms

No. of employees	Total no. of firms	Developed a new prod. etc.	Applied for IP protection	Hired a patent attorney
1-9	12	8	4	3
10-49	33	19	2	2
50-250	22	9	5	4
>250	14	11	5	4
Not declared	5	1	-	-
TOTAL	86	48	16	13

Filing an application for IP protection is not common regardless of the size of the firms although about 56 % of the firms reported to have developed a new product, process or design. However this ratio is the highest among micro-enterprises with 50 %; large and medium-scaled firms follow with 45 % of application. It can be seen from Table 34 that most of the firms that filed an application for IPRs hired a patent attorney.

Regarding the inconvenience experienced during applications, among the 16 firms who applied for a protection method, 50 % of them complained about high costs, 50 % from length of procedures, 18.75 % from complexity of procedures, 18.75 % of them from TPE not leading enough and 6.25 % of them for other reasons (late or non arrival of EPO receipt). One of the firms who did not consult a patent attorney did not face any problems. The applications were all at national level except for 5. None of the firms complained about attorneys although 81.25 % of the firms consulted one. The inconvenience experienced during IPR application is given in Table 35.

TABLE 35: Inconvenience Experienced During IPR Application

Total number of firms that applied for IP	Inconvenience during application	
16	High Costs	8 (50 %)
	Length of procedures	8 (50 %)
	Complexity of procedures	3 (18.75 %)
	TPE not leading	3 (18.75 %)
	Attorney not leading	0 (0 %)
	Other	1 (6.25 %)

Among the firms who filed an application, the number of firms who obtained a grant could not be determined as this point was not made clear in the questionnaires. As for post-grant inconvenience, only 8 of the firms faced difficulties after grant; 6 of them had their product copied and 2 of them found protection costs to be high.

The products of 6 of the firms were copied but 2 of them did not go to court for that because their rival had little modifications on their new product and they thought they would not be able to present enough proof to the court. 4 firms whose products were copied filed a law-suit. One firm complained that the legal procedures were slow and there did not exist specialized courts except for big cities. The others, whose products were copied, did not tell about the verdict or the difficulties they faced during the case.

10 of the firms reported to have benefited from grant in terms of firm reputation and 8 from product publicity. 3 of them had enlargement in business and 3 of them had financial gain after grant. 1 of the firms indicated that their grant discouraged their rivals from copying their products. 1 firm reported that they did not benefit at all from IP protection.

When asked whether the firms knew they could license their patented product, only 43 % of the firms (37 out of 86 firms) responded positively. 28 of the ones who knew they could license their product, considered this as an incentive. But none of the firms with a grant licensed their products. However, 4 firms reported that they had consultancy for licensing.

Figure 12 indicates the number of firms that know about and have searched patent documents. Only 29 % (25 out of 86) of the firms announced to know that patent documents were published and only 12 (13.95 %) firms made a search through these documents before applying for IP protection. No significant relationship between size and patent database search was observed.

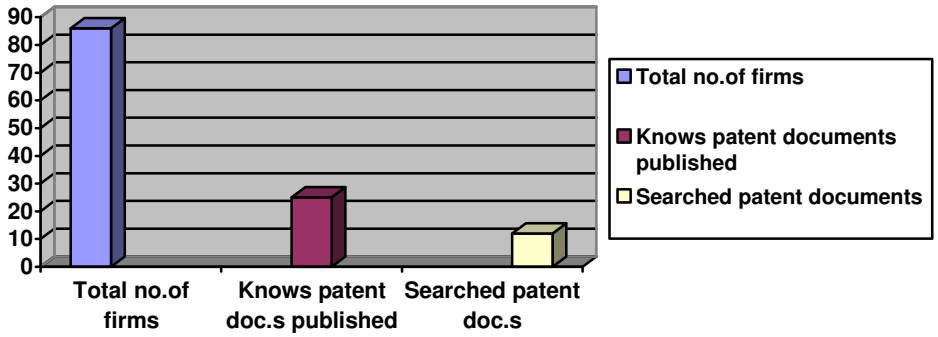

FIGURE 12: Firms that Know about and Have Searched Patent Documents

Awareness of the SMEs related to IPR institutions, IPR methods and utilization of patent documents is quite low and this leads to under-utilization of the system both as a protection method and as a source of technical information.

5. 4 Relationship of the Participant Firms with IPR Supports

In this section, participant firms were asked if they ever participated in seminars, training programmes about IPRs, whether they were familiar with IPR supports and if they ever made use of these supports.

Only 11 firms (12.79 %) participated in seminars about IPRs and 5 firms declared to have benefited from the seminar. 34 of the firms (39.53 %) knew about KOSGEB's IPR support but only 2 of them (5.88 % of those who knew) made use of that support. The reasons of not applying for that support were reported as not knowing the context of the support by 25 %, length of procedures by 9.52 % and other by 10.71 %. 1 firm declared that KOSGEB was distant to them and another claimed that KOSGEB tried hard *not* to give supports. A total of 3 firms made use of IPR support of other institutions. 2 of the participant firms made use of IPR support of TİDEB and 1 of them reported they were content with the results of the supports they obtained.

The number of firms who know about and made use of KOSGEB's IPR support according to firm size is given in Table 36.

TABLE 36: The Number of Firms Who Know About and Made Use of KOSGEB's IPR Support

No. of employees	Total no. of firms	Knowing IPR Support of KOSGEB	Utilized IPR Support of KOSGEB
1-9	12	7 (58.33 %)	1 (8.33 %)
10-49	33	12 (36.36 %)	-
50-250	22	10 (45.45 %)	1 (4.55 %)
>250	14	4 (28.57 %)	-
Not declared	5	1 (20 %)	-
TOTAL	86	34 (39.53 %)	2 (2.33 %)

It can be seen from Table 36 that only 2 firms (2.33 %) made use of KOSGEB's IPR support although 34 firms (39.53 %) knew about it. Micro-scale enterprises have the highest percentage for being informed about the supports, however no relationship between size and being informed could be detected. Firms with more than 250 employees have the lowest percentage of knowing about these supports but this is natural as they do not fit in SME definition. The reasons for not utilizing KOSGEB's IPR support is indicated in Figure 13.

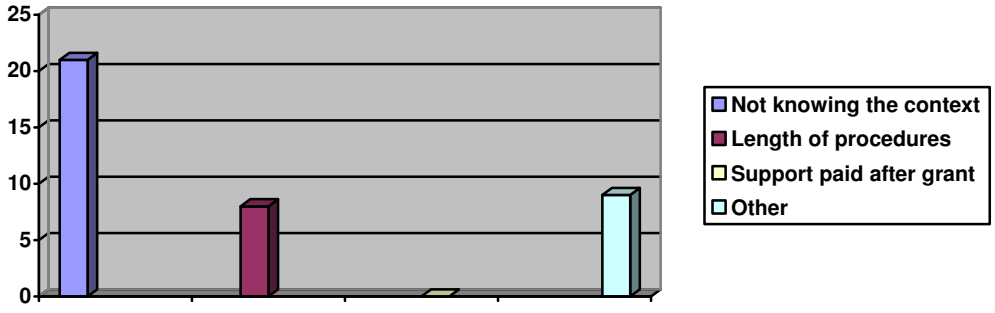

FIGURE 13: Reasons for not Applying for KOSGEB's IPR Support

According to Figure 13, "not knowing the context of the support" stands out as the main reason behind under-utilization. "Others" include feeling KOSGEB remote to firms. Length of procedures stands as the third main reason. Support being paid after grant was not mentioned by any of the firms as a reason of non-utilization.

Among 86 firms interviewed, 37 of them knew about the consultant support of KOSGEB, but only 1 of them applied for that support to hire a patent attorney. Firms were familiar with consultancy support of KOSGEB for fields of work other than IPRs. It has been observed that SMEs do not know that they can be offered consultancy support to hire a patent attorney.

As can be observed from the answers, the main problem about the IPR utilization of the SMEs is the lack of awareness both of the system and of the supports and benefits. Although 56% of the firms interviewed reported to have developed a new product, process or design, only one third of these firms applied for IP protection. Majority of the firms stated lack of awareness as their reasons for not applying. Similarly not applying for IP supports was mainly due to lack of awareness.

5. 5 Concluding Remarks

The survey, whose details were laid out in previous sections of this chapter, was carried out within the scope of this thesis to present a picture about IPR utilization of the SMEs in various regions of Turkey. It was carried out among 86 enterprises in 11 provinces, in 12 organized industrial zones by means of filling in a questionnaire. The survey had the objective of analyzing three main issues about the IPRs; namely R&D capabilities, IPR familiarity and relationship of the firms with IPR supports.

In the first part, it was found that 60.5 % of the firms are engaged in R&D activities while 33.7 % of the firms have a distinct R&D department.

The percentage of firms, who reported to have developed a new product, process or design, is 55.81 %. It should be noted that these innovative firms are not necessarily R&D performers. Only 43.75 % of the new products were developed as a result of R&D.

The rate of engagement in R&D activities seems higher than expected. However, when firms mention R&D, it often occurs during production process in the form of small variations in a product.

According to the replies by the firms in the questionnaire, IPR familiarity was found quite low. Although 81.40 % of the responding firms know about the field of work of the TPE, their acquaintance with EPO and WIPO is much lower; 31.40 % for EPO and 21 % for WIPO.

The firms interviewed know more about patent and trademark than other fields of the IPRs, namely utility model and industrial design. It is quite surprising to notice that even the firms in furniture and shoe design have not heard about industrial design registration. It was also astonishing that utility model is not much heard of although this IP protection model is claimed to fit the needs of the SMEs best. The percentage of familiarity with utility model is 48.84 % while it is 46.51 % for industrial design. In spite of the fact that these firms claimed to be informed about IPR methods of protection, cross-checking of the answers and some casual conversation made it clear that only 16.28 % of these firms really knew what each of protection method means.

Among the firms who developed a new product, process or design, only one third of them filed an application for IP protection. Majority of these firms (81.25 %) hired a patent attorney. The inconvenience during application was mentioned as high costs (50 %), length

of procedures (50 %), complexity of procedures (18.75 %) and TPE not leading (18.75 %). No complaints were raised about patent attorneys.

Two thirds of the innovative firms did not demand IP protection. The reasons for not applying were reported by the non-applying 32 firms as lack of information by 37.50 % % (12 out of 32 firms), complexity of procedures by 31.25 % (10 out of 32 firms), high costs by 31.25 % (10 out of 32 firms), length of procedures by 25 % (8 out of 32 firms) and other reasons by 31.25 % (10 out of 32 firms).

Among the firms who received a grant, the inconvenience experienced were high costs of protection and copying of their products mainly. 8 of the firms faced difficulties after grant; 6 of them had their product copied and 2 of them found post-grant protection costs to be high.

Out of 86 firms, 43 % of them knew about licensing and out of those who knew about it, 75.68 % of them thought licensing their patented product could be useful for the firm. Among the firms who obtained an IP protection for their product, process or design, 10 firms reported to benefit from firm reputation, 8 from product reputation, 3 from enlargement of business and 1 firm from other advantages. None of the firms licensed their products although 4 firms had consultancy for licensing.

According to the second part of the questionnaire, unawareness of the firms about IPR system, about the related institutions and post-grant advantages are the main deficiencies of the SMEs regarding IPR familiarity.

The third part of the evaluation has been dedicated to IPR supports. Firms surveyed have little awareness of IPR supports of KOSGEB, although this group of supports is meant to be considerably important. 39.53 % of the firms knew about this support of KOSGEB and among those who did, less than 3 % applied for that support. The reasons for not utilizing the IPR support were reported as not knowing the context of it by 24.4 %. 43 % of the firms knew about consultancy support of KOSGEB, however only 1 firm reported to utilize that support to hire a patent attorney. 3 firms made use of the IPR support of other institutions.

Research results indicate low level of IPR support utilization as well and the main reason for this seems to be lack of awareness. Although KOSGEB has IPR supports targeted at SMEs, the firms are hardly aware of it and therefore under-utilize these supports; they are particularly not aware that the consultancy support could be utilized to hire a patent attorney.

The main results detected from the survey for under-utilization of the IPR system by the SMEs, can be summarized as lack of awareness and high costs. Unawareness about post-grant benefits is also significant. The level of awareness does not seem relevant to firm size for any part of the survey. Despite the fact that about 60 % of the firms declared to carry out R&D, R&D capacities of the surveyed firms are low. Low level of R&D activities also leads to low level of IPR utilization.

The next chapter is dedicated to policy proposals for increasing the IPR utilization by the SMEs, taking into consideration the reasons behind this low level of utilization.

CHAPTER VI

POLICIES NEEDED TO ENCOURAGE SME'S TO INCREASE UTILIZATION OF THE IPR SYSTEM

In order to bring about policies for SME's to make more use of the IPR system, the reasons of under-utilization must be kept in mind. The main reasons can be listed as lack of knowledge of the system, high costs and the long duration required for granting an IP protection. Apart from patenting costs, SME's face some problems in affording a patent attorney, translation costs and defense costs in case of infringement. For these reasons, in some European countries firms are assisted financially.[178] Another suggestion could be that a fair ground for infringement suits be provided for small firms.

Detailed evaluation of surveys carried out among SMEs both in Europe and in Turkey about the utilization of the IPR system, suggests different reasons for under-utilization by Turkish SMEs from their European counterparts. Though both SME groups complain about high costs, costs in Turkey are much lower compared to Europe. However it should be noted that the annual turnover of Turkish SMEs are much lower than in Europe too.

Lack of awareness of the system is another reason for underutilization but unawareness in Turkey seems to be more significant. Similarly, problems related to affording a patent attorney and defense costs at courts are pronounced more by European SMEs. This does not mean that Turkish SMEs do not face such problems but rather they are not that familiar with legal system concerning IPRs and many firms did not file a law-suit in case of infringement.

Today, patent policy options in Europe focus on encouraging SMEs to patent through information campaigns and by reducing application costs; encouraging them to patent, and extending what is patentable to new areas such as proteins, gene sequences, software, and business methods.

Another attempt by the EU is to reduce the complexity of patent procedures from which the SMEs will benefit most. Also, work is being carried out for building awareness for the use of patent system among SMEs.

One explanation for why small firms patent less than large firms is because they are less able to defend their patents from infringement. According to Arundel, a better dispute

[178] European Trend Chart on Innovation...

mechanism could do far more to encourage patenting by SMEs than policies to reduce application costs.[179]

6.1 What Institutions Do for SME's Worldwide

Some institutions including patent offices in Europe have SMEs as their target group to encourage their usage of the IPR system.

Austrian Patent Office for instance, sees SMEs as a special target group and has special services for them, such as seminars, participation in fairs for SMEs, workshops. Poland Patent Office, where 10 % of total applications were filed by SMEs in 2002, does not charge some portion of the application fee if the applicant proves that he/she is unable to pay it. Similarly, Norwegian and Belgian Patent Offices have discounts in fees for SMEs however many patent offices do not have special policies for, nor they hold statistics of SME applicants.[180] Some patent offices also run training courses related to the procedures for obtaining IP rights and to the usage of the information contained in patent database.

Danish invention center, a branch of Danish Technology Institute, provides support for inventors, scientists and SMEs from the birth of an idea to its implementation in the market.[181] The services are a web-site, a phone line, conferences, innovative sessions for firms, licensing of patents for the inventors and the SMEs. This is particularly remarkable as most SMEs are not aware that they could license their patented innovations. Danish Patent Office also has special emphasis on SMEs. One person engaged in SME issues is responsible for organizing training activities for IPR, has visits to firms.

Patent usage in the EU is being encouraged by EU institutions, inter-governmental collaborations, companies and universities. As a result of such collaboration, the following results have been obtained in different countries, which may give an idea of policy options:[182]

In Belgium, universities have partnership with spin-off firms. Patent usage by the SMEs is being encouraged by inter-governmental collaboration. Sectorial research centers, apart from their routine work, co-work with SMEs and establish patent units in collaboration with the Patent Office. In spite of such efforts, only 20 % of the SMEs were engaged in innovation activities in 1996 while this percentage in big firms is 52. Innovation costs have been as 1.6 % of their earnings, which is the lowest in the EU. Only 3 % of SMEs have applied for a patent between 1994-1996, again the lowest percent of EU.

In Denmark, the percentage of SMEs having had at least one patent application between 1994-1996 was 8 %. Danish Patent Office aims at increasing this percentage by co-

[179] Arundel, Patents in the Knowledge-Based…

[180] Morgül.

[181] Ibid.

[182] Ibid.

working of various institutions. Also, the Office has patent classes in Danish Technical University for post-graduate students.

In Germany, two assistance programmes for SMEs aim at improving the innovative capacity of the SME's. Between the years 1994-1996, 7 % of the SMEs filed at least one patent application. But most firms rely on secrecy. SME-Patent project provides assistance especially for SMEs applying for a patent for the first time. 25 patent information centers provide related information to SMEs as well as to patent attorneys.

The priority of French government is to develop consultancy function of the patent office and to make SMEs more informed about the usage options of patents. Ten regional delegations of the French Patent Office (INPI) are in close contact with the SMEs and organize training activities. As a result of these activities, 8 % of SMEs filed at least one patent application between 1994-1996.

Similarly, between 1994-1996, 7 % of the Irish SMEs filed at least one patent application. The government holds consultancy for protection, improving and marketing of patentable technologies.

Structural changes were made to simplify patent procedures and Patent and Trademark Office of Italy had activities for improving patent consciousness of potential inventors. There are 20 regional patent information centers and 9 % of SMEs filed at least one patent application between 1994-1996. Domestic patent applications increased by 10 % in Italy in 1999 as a result of certain policies.

Informing the SMEs about the patent system in Luxembourg is carried out by public research centers and CRP Henri Tudor Center. Despite all efforts, only 3 % of SMEs filed at least one patent application between 1994-1996.

Dutch IP Office has identified SMEs as one of its target groups and 7 % of SMEs filed at least one patent application between 1994-1996 in Netherlands. A total of 2997 patent applications were filed in 1998 and 37 % of them were realized by SMEs.

Portugal IP Institute has simplified some procedures and made them accessible through the internet. There are projects going on to increase SME awareness of patent usage. Despite all efforts, only 2 % of SMEs filed at least one patent application between 1995-1997. However, European patent demand increased extensively between 1994-1997.

Swedish Patent Office employs a group of people who visit 200-300 SMEs each year and inform them about patent, trademark and other IP aspects. The office also provides information through the internet and bulletins. There are invention centers all over the country where innovators get assistance for the evaluation of business ideas, improvement of business plans and financial issues. 8 % of SMEs filed at least one patent application between 1994-1996. The percentage of innovative SMEs were 39 % in 1996, 50 % of SMEs participated in projects together with universities, research centers and other institutions, and 2.7 % of total SME revenues were invested in innovation the same year.

54 % of British SMEs are engaged in innovation activities and 27 % of SME's have R&D activities. The percentage of SMEs that applied at least for one patent between 1994-1996 is 4 %. [183]

These examples indicate very active participation of patent offices in SME issues. In Turkey, only recently TPE had training for KOSGEB staff about IPR system but KOSGEB intends to inform the SMEs when requested. Since SMEs are not aware of the system, and do not consult KOSGEB in many cases, they can hardly be expected to go and inquire about the IPR system in KOSGEB.

DG Enterprise of the EU has got a web site, www.ipr-helpdesk.org whose aim is to raise awareness of the importance of protecting and exploiting Europe's IPR assets provides IP related assistance. But no specific assistance is provided for the SMEs.[184] The programme provides assistance to firms who wish to attend research programmes about all fields of intellectual property.

Member states of WIPO proposed a programme in 2000, focusing on intellectual property-related needs of the SMEs. [185] SME Programme of WIPO aims:

- Collection of policies, programs and strategies that aim to encourage a wider and more efficient use of the IP system by SMEs,
- Identify experiences that have had a real impact in making the IP system more accessible to SMEs,
- Identify replicable mechanisms that may be adapted to the institutional and economic context of other countries,
- Encourage exchange of experiences,
- Enable SMEs to make informed business decisions on how to fully exploit their innovative and creative potential through an effective use of the IP system,
- Improve the policy framework and business environment by assisting governments to make it conducive and easier for SMEs to use the IP system.

While trying to accomplish these tasks, WIPO has cooperation with:

- National and regional IP Offices,
- SME focal points within governments,
- Chambers of commerce and industry,
- SME associations and cooperatives,
- Incubators, science parks and technology parks,

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[183] Ibid.

[184] www.ipr-helpdesk.org, 2.11.2005.

[185] Jaiya Guriqbal Singh, Best Practices for Raising Awareness, Use and Exploitation of IP Assets, paper presented in Conference on Intellectual Property Rights for SMEs- in cooperation with WIPO and TPE, İstanbul, January 10-11, 2005.
http://www.wipo.int/sme/en/activities/meetings/taiex_05/index.htm

- Universities,
- Private sector consultants,
- Financing institutions (including venture capitalists).

WIPO assist SMEs through its website, news-letter, guides, events, expert missions, CD-ROM products, WIPO Magazine articles and studies.

First of all, WIPO web site gives information about the usefulness of patent documents as a source of information. WIPO's SME initiative aims to promote a more active and effective use of intellectual property system by SMEs. WIPO also assist national governments to strengthen their capacity, to develop strategies to meet the IP needs of the SMEs. According to the web site, about two thirds of technical information revealed in patents is never published elsewhere and the entire set of patent documents worldwide includes approximately 40 million items. This makes patent information a unique source of classified technological data.[186]

WIPO's activities on SMEs include development of comprehensive and user-friendly promotional information materials, guides and training packages, organization of seminars, assistance for SME institutions.

Framework Programmes of the EU aim at developing the science and technology capacity in EU countries and innovation programme is one of the significant parts of the programme. Within the scope of the Framework Programme of the European Union, some support actions are intended to help preparations for community research and technological development, to encourage SMEs to participate in such activities. These support actions include activities such as conferences, seminars, technology transfer related services, development of research strategies. Specific support actions are also established to stimulate, encourage and facilitate the participation of SMEs in the activities of such projects.

Sixth Framework Programme in which Turkey participates includes seven main themes one of which is supporting R&D and innovation activities of new establishments and SMEs. In this respect, encouraging SMEs to make more use of the IP system has been emphasized.

Considering the role of the institutions in other countries, Turkish institutions that are involved in IPR issues will be examined below and it will be tried to put forward some possible roles to enhance better utilization of the IPRs by Turkish SMEs.

[186] www.wipo.int/sme/en/ip_business/patents/patent_information.htm, 18.10.2005.

6.2 Institutions in Turkey

There were approximately 22,000 patent applications in Turkey between the years 1993-2003, 80 % of which was foreign applications. US and German firms lead foreign application in Turkey. According to Sinan Aygün, Chairman of Board at Ankara Chamber of Commerce, one of the reasons why patent applications are so low in Turkey is that patent application fees are already high and 18 % of VAT is charged in addition to fees.[187] He suggests that the government should not profit out of invention, on the contrary the government should support inventors. A second reason for that is 40 % of college students studying abroad do not return to Turkey after graduation and this creates brain immigration. Another reason for low level of patent applications is seen as the inadequacy of secondary education.[188]

The number of patent applications increased in 2004 but still did not reach the desired level. In 2004, 55 % of patent and utility model applications were filed by domestic firms. However granting of patent protection is lower among domestic applications.[189]

Patent applications by the SMEs constituted 29 % of all patent applications in 1996, while this percentage increased to 42 in 2000.[190] Table 34 indicates the number of patent and utility model applications by SMEs between 1996-2003 in Turkey.

TABLE 37: Number of Patent and Utility Model Applications by SMEs between 1996-2003

YEARS	No. of applications filed by SME's	Total no. of domestic applications
1996	107	376
1997	132	456
1998	185	533
1999	217	649
2000	383	804
2001	398	1009
2002	550	1372
2003 (as of March)	156	439

(Source: Morgül_Avrupa Birliği ve Türkiye'de KOBİ-Patent İlişkisi, Türk Patent Enstitüsü uzmanlık tezi, Ekim 2003)

[187] Aygün.

[188] Balcı, Yusuf, Speech made at the opening of the Panel titled "New Dimension in Competition, Patent, Trademark, Design" Ankara Chamber of Commerce, December 6, 2005.

[189] Aygün.

[190] Morgül.

In Turkey, there are classes related to intellectual property rights mostly in post-graduate level. The universities that include those classes are Middle East Technical University, University of Ankara, Marmara University and Bilkent University. Also, there are short-term training programmes within Ankara University.

Institutions that are involved in IPR issues could have a more active role to encourage SMEs for increased utilization of the IPR system. Some information about the institutions which are totally or partly related to IPRs, is given in the following sub-sections.

6.2.1 Turkish Patent Institute (TPE)

TPE is the authorized institution to provide IPR protection. Since its foundation, all legislation related to IPR system has been enforced in global standards and is being revised whenever needed.

Currently, drafting of the Act for Patent and Utility Model and the Act for Industrial Designs to replace the existing ones is going on. The reason for such a revision was reported as harmonization with the revisions in international legislation, with EPC and TRIPS Agreements.[191] One of the most outstanding revisions is to include biotechnological inventions within the scope of harmonization with the acquis of the EU. This arrangement is in parallel with EU's objective of extending patentable areas to promote more utilization of the IPR system.

Another revision is the abolition of patents without examination due to some disadvantages observed since the enforcement of the original act and because a cheaper and shorter way of protection is already provided by utility models.

Apart from that, examination request coming from third parties is made possible for utility models. This revision is expected to remove infringements seen very often in utility models, which was reported as a disadvantage in the Eighth Five Year Development Plan. Since utility model protection is seen more appropriate by the SMEs, this step is expected to encourage SMEs to make more use of the system.

Examination of patent applications, which used to be fulfilled by Russian or Austrian patent offices, is being carried out by TPE since the beginning of 2005. Before that, patent offices of other countries were realizing this process within the framework of an agreement. This novelty helps save time and cost of patenting procedure. All the information concerning the IPR system and application forms for each type of protection as well as other relevant information are contained in the web page of TPE. It is also possible to search the patent database through this site.

Although TPE does not have specific programmes for the SMEs, it has been training KOSGEB staff about IPR system so that they can assist better to SMEs. Almost all of the staff has been trained so far. TPE has information offices in most parts of Turkey. As a result

[191] www.tpe.gov.tr

of co-operation with KOSGEB, technological centers of KOSGEB are being used as TPE information centers and thus the number of these information offices reached to 100.

Another common project related to SMEs and improvement of their innovative capacity, will start in 2006. The project will be financed by the Dutch government. The beneficiary is TPE and KOSGEB is the partner of the project.

TPE carries out some activities in cooperation with international organizations. WIPO and Turkish Patent Institute have organized a conference on intellectual property rights for SMEs in İstanbul in January 2005. The aim of the conference was:

- to provide senior officials of relevant governmental departments/ or ministries, SME support institutions, University Licensing/ Technology Transfer Offices, Chambers of Commerce and Industry, Business Consultants and owners, managers and key staff of SMEs with a fundamental understanding of IP rights;
- to highlight the benefits of IP for start-ups and SMEs as a strategic tool for business development;
- to strengthen IPR management capacities and skills of SME support institutions and SMEs; and
- to develop strategies to enhance the capacities of SME support institutions in facilitating the access of SMEs to the tools of the IP system.[192]

Compared to patent offices of European countries, it may be claimed that the role of TPE in encouraging SMEs for better IPR utilization could be enforced. TPE could launch special programmes for the SMEs in collaboration with other institutions.

6.2.2 Small and Medium Sized Industry Development Organization (KOSGEB)

KOSGEB is the institution whose task is to assist SMEs in general. KOSGEB also has technology and IPR assistance for firms. It has established technology development centers since 1992, some of which are situated in universities. It has been aimed by these centers to develop university-industry cooperation. Enterprises established in these centers benefit from a series of supports provided that they bring about technological novelty, economic value and entrepreneurship.

The supports provided in technology development centers are:

- Work space (2+1 years),
- Office services,
- Consultancy and internet services,
- Usage of common facilities,
- Conference halls,
- All facilities of the university,
- General KOSGEB supports,

[192] http://www.wipo.int/sme/en/activities/meetings/taiex_05/program.pdf

Supports with payback

- Material, equipment support for prototype production (200,000 YTL),
- Support for quality improvement and provision of technical equipment (50,000 YTL),

Supports without payback

- Consultancy (20,000 YTL),
- R&D and publication (3000 YTL),
- Rent support in TDZ's (20,000 YTL),
- Work space (2+1 years),
- Participation in conferences, fairs abroad (5000 YTL),
- Intellectual property supports.

All supports without payback are provided after the service is obtained and paid for. For example an entrepreneur first has to participate in a fair, pay the costs himself and gets paid by KOSGEB on his return. Similarly, an inventor first has to file an application in TPE, get a pre-confirmation of support from KOSGEB and gets his support upon granting of patent protection.

Expenses related to granting of patent or utility model protection for SME inventions coming out in technology development zones, are supported by KOSGEB. The supports are without payback and mainly constitute of payment of a part of expenses for an IPR protection.

IPR supports provided by KOSGEB are as follows:[193]

- 70 % of patent granting expenses (not to exceed 6,000 YTL for domestic grant and 10,000 YTL for international grant)
- 70 % of utility model granting expenses (not to exceed 6,000 YTL for domestic grant and 10,000 YTL for international grant)
- 70 % of industrial design registration expenses (not to exceed 6,000 YTL for domestic grant and 10,000 YTL for international grant)
- 70 % of integrated circuit protection expenses (not to exceed 6,000 YTL for domestic grant and 10,000 YTL for international grant)

The most significant point about these support items is that the amount and support percentage are equal for all types of protection. Another outstanding issue about IP supports is that no support is mentioned for patent attorneys. Mr. Çolakoğlu, Vice President of KOSGEB has pointed out that attorney support can be provided in the context of consultancy support.[194] However, results of the survey indicate that SMEs do not seem to be informed about this fact.

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[193] http://www.kosgeb.gov.tr/Ekler/Dosyalar/BilgiBankasi/114/4%20SINAI%20MULKIYET%20DESTEKLERI.doc, 3 March 2006.

[194] Çolakoğlu, Mustafa, Private interview, December 6, 2005, Ankara.

KOSGEB provided trademark and advertisement support to 57 firms in 2003, to 647 firms in 2004. Patent, utility model and industrial design support was provided to 1 firm in 2003 and to 66 firms in 2004. Also support for intellectual property rights was provided to 4 firms in 2005 as of October 10.[195]

KOBİ-NET project which provides a web-connection for all SMEs also provides them with a web page and access to other firms. This may give the enterprises an opportunity to search patent data bases, which are not explored by the SMEs sufficiently.

Consultancy is provided in TEKMER and KÜGEM about patent, utility model and industrial design protections but SMEs are often unaware of this service.

6.2.3 State Planning Organization (DPT)

The main duty of DPT is to define general policies of the country. The development of "Invention and Design Center" was proposed in the 8th Five Year Development Plan, in order to promote innovation and creativity. It is stressed in the specialized commission report that the project should also be supported by private sector and associations. It has been pointed out in the same report that SMEs need to be informed about how the IPR system promotes protection of their competitive advantage and how ideas may be turned into profit.

Other policy options proposed by DPT in the 8th Five Year Development Plan are as follows:

- TPE should create a "Frequently Asked Questions" section,
- Bylaw numbered 98/3 should be revised, support should be paid during applications and SMEs included in it, (surprisingly, this was repealed in March 2004),
- A new system of incentives should be adopted to include both R&D and IPR supports,
- Payment for inventors who are also employees, (this incentive exists only in Germany, France and Sweden)
- Revisions should be made in selection of patent attorneys,
- Unregistered protection for industrial designs should be made possible. This is because many designs come out especially in textile industry where market life is short and registration procedures take too long. A protection system proportional with market life has been proposed.

Community Design proposal of the EU adopted short-term (3 year) unregistered protection as well as long-term (5 year) registered design protection. This revision is included in the draft Act for Industrial Designs.

The preparations for the 9th Five Year Development Plan are currently being carried out by DPT. In the previous five year plan, it was suggested that utility models should also include process innovations and that a separate department be established in TPE.

[195] www.kosgeb.gov.tr/Destekler, October 13, 2005.

Specialized commission report concerning the IPRs points out that problems related to utility model protection mentioned in the previous development plan have not been solved but that others concerning legal issues not mentioned in that plan have been solved.

Another point concerning the utility models is that, the protection is being provided after formal examination of the documents, not examining other requirements. It has been underlined in the Specialized Commission Report that this system is in accordance with the scope of utility model protection as the applications are filed mostly by SMEs. The system aims at grants with little expense in order to encourage little innovations. But most utility models that have been granted national protection do not meet the requirements and therefore open to the threat of invalidation.[196] The new draft law tends to bring about solutions for this problem.

In terms of industrial design, a special department was founded within TPE. Participation in the Hague Agreement in October 2004 has been another achievement. Another proposal of the 8th Five Year Development Plan was to establish legal ground for protection without grant for industrial designs, which was expected to help textile industry in particular. This has been emphasized in the new report as well and the new draft law has such arrangements.

Another point concerning industrial designs is that, the protection is being provided after formal examination of the documents, not examining other requirements. It has been underlined in the Specialized Commission Report that most industrial designs that have been provided national protection do not meet the requirements and therefore cases of infringement often end up in favor of the plaintiff.

According to Specialized Commission Report, although TPE has a new building with adequate qualifications, it still lacks experts. No departments for utility models and geographical signs were established. Another achievement is that TPE is now capable of patent search and the institute now carries out searching of 40 % of total applications. It is also possible to reach European patent documents through Espacenet through TPE web-site. Still, on-line applications are not possible.

As for patent attorneys, it was pointed out in the 8th Five Year Development Plan that the requirements listed in the Act No. 544 were not adequate for patent attorneys to function internationally and that an organization for attorneys did not exist. To overcome these problems, it was proposed to:

- Establish legal bases for patent attorneys,
- Establish an organization like a chamber for patent attorneys,
- Require knowledge of a foreign language and graduation from departments of basic sciences or engineering,
- Require at least three years of practice in an office of a patent attorney.

[196] Specialized Commission Report on IPR for the 9th Five Year Development Plan, State Planning Organization, www.dpt.gov.tr

According to the Specialized Commission Report for the preparation of 9th Five Year Development Plan, none of these proposals have been realized. It was pointed out once again that the requirements for functioning as a patent attorney should be brought to international standards.

The weaknesses of the IPR system in Turkey were put forward in the Specialized Commission Report for the preparation of 9th Five Year Development Plan, and issues that might concern the SMEs are as follows:

- Lack of awareness of the benefits and information function of the system,
- Lack of innovation policy and its reflections to IPR system,
- Lack of qualified personnel about IPR, both in institutions and in specialized courts,
- Low level of R&D activities, and inventions,
- Lack of full publication of verdicts,
- Lack of coordination between institutions such as DPT, TPE, TÜBİTAK, TSE.

6.2.4 The Scientific and Technological Research Council of Turkey (TÜBİTAK)

Department of Intellectual Property Rights was established within The Scientific and Technological Research Council of Turkey in 2004 with the purpose of conducting intellectual property issues arising from R&D activities supported by the Council. The department also carries out training activities within the Council about intellectual property rights. No studies are carried out specifically for SMEs.[197]

6.2.5 Turkish Union of Chambers and Stock Exchanges (TOBB)

TOBB helps raise the awareness of firms about the IPR system by organizing seminars, conferences and through publications both of its own and of other institutions like KOSGEB. They do not hesitate to open their resources for training purposes. For example SME Guide, prepared by KOSGEB and TOBB and published by TOBB, gives detailed information about the IPR system to SMEs.

6.2.6 Turkish Institute for Standards (TSE)

TSE has published a CD containing over 500.000 patents published since 1978 in the EU and the USA. All the information and the communication details of the patent owner are given so that the users may get in touch with the owner and buy the usage rights of the product.[198]

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[197] Ertem, Berkem, Patent and Trade-Mark Attorney, Personal Interview, October 10, 2005, Ankara.

[198] Çolakoğlu, KOBİ Rehberi…

6.2.7 Foundation for Technological Development (TTGV)

TTGV, a foundation founded for enhancing technological development in Turkey, supports promotion of technology development projects in Turkey with financial resources from Undersecretariat of Treasury.

Expenses related to patenting of a product or process are considered as project expense in the budget of the Foundation, in case the product or the process is developed with TTGV support in TDZ's.

TTGV has supported about 250 projects since its launch. It provides innovative SMEs with expert assistance on a project basis in terms of both technology and financial and management issues. The commercial success of projects supported by TTGV is reportedly high.[199]

6.2.8 Undersecretariat of Foreign Trade (DTM)

A bylaw was published in 1998 for Supporting Patent, Utility Model and Industrial Design Expenses. A part of the expenses related to IP protection was to be covered by Undersecretariat of Foreign Trade, for technology intense projects that have export potential. The supports were as follows:

- 75 % of the cost of patent application file preparation (not to exceed 1000 USD) and translation costs,
- 75 % of the fees to be paid to TPE,
- 75 % of the fee to be paid to TPE for patent protection of the first 5 year period,
- 75 % of the cost of utility model application file preparation (not to exceed 500 USD),
- 75 % of the fee to be paid to TPE for utility model protection of the first 5 year period,
- 75 % of industrial design application fee.

The payments were to be done after grant in order to support really patentable innovations. The support of the fees for the first five year aimed at production of the invention right away.[200] Although policies suggested revising this bylaw to support during applications and to include SMEs, surprisingly, this was repealed in March 2004. The reasons for the repeal were explained by the officials of the DTM as:[201]

- The support not being adequate (about 70-80 YTL per application, 500-600 YTL in total),
- Not enough number of applications,
- The expected outcomes not reached,
- No direct relationship with exports,

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[199] http://www.ttgv.org.tr/tur/05_sanayici_rehberi/51.htm#15

[200] Yalçıner, Sınai Mülkiyetin…

[201] Kaçaroğlu, Serpil, Undersecretariat of Foreign Trade, personal interview, 22 March 2006.

- Caused no increase in exports,
- The issue not being directly related to DTM,
- Such support for individuals not seen as beneficial for economic development.

Another bylaw concerns the supports for trademarks. "The Bylaw for Supporting the Trademarks, Advertisement and Popularity of Turkish Products Abroad and Setting up of 'Made in Turkey' Image" was published in the Official Gazette dated 29 January 2000. (By-law No. 2000/3). Additional support items are:

- Trademark registration fees abroad,
- Trademark design works,
- Consultancy services.

The institutions related to IPR matters are quite sufficient in Turkey. The only problem seems to be the need for a better coordination about assistance to SMEs. Especially a better coordination between TPE and KOSGEB could be very helpful to raise the awareness among the SMEs about the IPRs. The following section lays out some policy proposals to enhance an increased utilization of the IPR system by the SMEs in Turkey.

6.3 Policy Proposals

In order to bring about policies for SMEs to make more use of the IPR system, the reasons for under-utilization must be kept in mind. The first field of study must be dedicated to raising awareness among SMEs. According to Special Commission Report for the 9th Five Year Development Plan, the main issue is unawareness and lack of information about the system. Results of the survey carried out in OIZs indicate the same issue. Despite KOSGEB supports for R&D and IPR, enterprises which make use of these supports are very few. Only 1.2 % of the firms got support from TTGV, 2.7 % from TİDEB, 1.3-2.7 % of them from KOSGEB, and Undersecretariat of Treasury.[202] Reasons for not making use of these supports were reported as unawareness of support programmes and the length of bureaucratic procedures.[203] KOSGEB provides consultancy about IPR system in technology centers and in centers for supporting small scaled enterprises, however SMEs are hardly aware of this service.

A systematic SME policy is required and participation in support programmes should be encouraged; bureaucracy should be lessened. Pilot projects could be launched and best practices made heard of within this context. KOSGEB's IPR support is available after grant and beforehand, the enterprise has to make all payments. Since granting a patent protection can take two years, grant support takes too long to make use of. Although the interrogated firms in the OIZs did not mention this as a problem, the time of payment to SMEs can be re-arranged within the context of that support.

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[202] Specialized Commission Report on IPR for the 9th Five Year Development Plan, State Planning Organization, www.dpt.gov.tr

[203] Taymaz.

When IPR issues are considered, it is often patent that is recognized by the firms. The familiarity with the notion of trademark ranks as the second, however utility model and industrial design are the least recognized fields of the IPRs. Owning a trademark is often over-emphasized while improving new technologies and acquiring patent protection is never heard publicly. There are seminars organized occasionally but they do not seem to be adequate. Therefore, public pronunciation of IPR aspects other than trademark should be stressed by public institutions and non-governmental organizations like the chambers.

Industrial design is the field of IPRs the least known to the SMEs. Developing an industrial design and having protection for it may be an option for SMEs to obtain higher added-value, where technology cannot advance at the desired level. SMEs should be made more aware of industrial design protection and training programmes, seminars, conferences could be dedicated to this specific issue. Industrial design departments of universities and TPE could jointly organize such events.

Similarly, the awareness about utility models is far less than expected. Ironically, this field of IP protection is said to fit the needs of the SMEs best. Raising awareness particularly about utility model and industrial design protection is essential. Keeping in mind that attendance in training programmes is quite low, such programmes could be organized more often with larger participation of SMEs.

Many of the patent offices in Europe have special programmes for SMEs. Here, the role of TPE should be more than training KOSGEB personnel, though this is also a giant step. More information should be provided about other aspects of IP (other than patent and trademark), SME oriented training programmes, conferences, seminars, publications should be provided. Free consultancy should be available to SMEs and KOSGEB support should be improved. TPE and KOSGEB staff could visit SMEs periodically to inform them in their workshops, like the Swedish Patent Office does. This would solve the problem often referred by the SMEs as “KOSGEB always waits for us to go there,” and by KOSGEB as “we have so many supports but SMEs do not care to apply.” During those visits, KOSGEB and TPE staff could also show SMEs how to use patent data base, which is a field really unknown although almost all of the firms interviewed have access to the internet.

SMEs lack awareness of patent data-base search; they find it difficult to search it through the internet even if they are aware of it. What most of the firms understand from R&D is little improvements on already existing innovations. Also, while making use of the existing inventions in incremental innovations, almost no research is made whether that invention is protected by IP system. They need to employ qualified staff for such search and such awareness in general, and the importance of personnel support of KOSGEB comes into scene, whose scope can be enlarged.

Patent data base may be designed in a more user-friendly way for the SMEs. Firms interviewed within the context of this study know less about WIPO and EPO than TPE. The WIPO web-site is in English, French and Spanish and partially in Chinese, Arabic and Russian. Turkish translation of the web-site should be provided for better assistance to

Turkish SMEs and this attempt could be initiated by TPE. TPE staff could have visits to SME workshops and show them how to use patent data base, introduce them to WIPO SME web-site and EPO web-site as these two institutions are not well known among SMEs.

Another attempt by TPE could be to have separate statistics for the SMEs in their data-base. Currently, an application or a grant does not give an idea whether the applicant is an SME or not. Even in personal applications, the size of the company could be interrogated and recorded for statistical purposes for structuring policies. This implementation can be made world-wide in all patent offices.

Although patent fees are very low in Turkey compared to European countries, Turkish SMEs cannot afford even those low fees as their turn-over is also low. Charging additional value-added tax for IPR applications would be contradictory to innovation policies as well as a burden for the SMEs. Policies should encourage inventions and an exemption from value-added tax would indicate government's dedication for improving the innovation situation in a country.

Ministry of Industry and Trade carries out the task of constructing technology development zones, organized industrial zones and small scaled industry estates. Although KOSGEB has offices in many of these zones and provides consultancy, the service does not seem to be enough. In the fist one, more technology oriented firms are situated and they do not have awareness problems. But for the latter two, the services should go beyond infrastructure construction support and IPR related services may be provided in collaboration with the administrations of these zones, TPE, KOSGEB and the Ministry. Even an office dedicated to IPR issues may be opened at each zone with such collaboration.

Apart from these zones, analysis and studies related to industrial clusters should include IPR awareness and assistance. In a typical case, each of the member's group may have a small workshop in the same area, sharing a common data base on equipment, clients and other business information. When they succeed in developing an original technology or know-how, they may jointly apply for a patent or a utility model.

One other result obtained from the surveys is that the SMEs lack knowledge of how they can make use of a patented innovation. Firms seem to be unaware of benefits of IP protection and therefore they were not engaged in licensing, contracts and commercialization of their products. This made them not see the benefits of the IP system. Here comes the significance of post-grant consultancy. KOSGEB supports include fees for granting an IP protection but firms should be provided with IP management supports as well in order to commercialize an invention, license its know-how and organize joint-venture agreements. Similarly, pre-grant supports should be improved and better announced.

Although a majority of the few firms who applied for IP protection for their invention hired patent attorneys, no specific complaints were raised for patent attorneys. It may be due to the fact that not many firms filed an application for IP protection and therefore still they did not meet many patent attorneys. In this respect, better relationship between SMEs and attorney firms should be encouraged both by KOSGEB and by TPE. Firms may be

acquainted with such firms even before developing a new product, process or design. The system of selection and training of patent attorneys could be revised as suggested by both the Eighth Five Year Development Plan and the Specialized Commission Report for the Ninth Five Year Development Plan.

For creating awareness among the SMEs, it is essential to develop an innovative society. Classes related to intellectual property should not be limited to post-graduate programmes and to law schools. To raise social awareness, project oriented classes and IPR issues could be integrated even in the programme of primary schools to give an idea of the system at the early ages. Students should be encouraged for innovation through projects for invention and IPR implementations. They could visit TPE and industrial establishments to form the bases mentally, for their possible future innovations. As SMEs are themselves copiers, they do nut trust IP system. In this context, training starting from the primary education will help create an innovative society instead of a copying one. Incentives and other state aids work only if and where there is awareness and this awareness should be made a part of the society.

While designing policies for the SMEs to make more use of the IPR system, it should be noted that the SMEs do not have a homogeneous structure and they have different needs depending on their particular structure. Their diffused needs should be considered and it should be accepted in the beginning that tailor-made policies would have undesired consequences.

CHAPTER VII

CONCLUSIONS

Small and medium scaled enterprises constitute a large portion of all enterprises, total employment, investments, added-value and exports both in Turkey and in Europe. As innovation and technological development are seen indispensable for economic growth, with such a big share among all enterprises and a dynamic structure, innovations brought about by the SMEs are more important for economic and technological development than supposed to be. The utilization of intellectual property rights, particularly of patent, utility model and industrial design registrations for the SMEs is expected to be one of the most important components of the innovation and development policies.

Research carried out both worldwide and in Turkey, suggests under-utilization of the IPR system by the SMEs. The main reasons for this under-utilization can be listed as lack of knowledge of the system, high costs and the long duration required for granting an IP protection.

Considering that the main reason for under-utilization of the IPR system by Turkish SMEs is the lack of knowledge, raising awareness among SMEs should be considered as the first step to be taken. Training programmes, seminars should be organized with higher participation of the SMEs and best practices should be brought forward during these programmes rather than mere information about the IPRs.

Although there are some support programmes, SMEs are hardly aware of this service either. According to research results, support programmes are not adequate and this could also be observed with a comparison of services fulfilled by institutions of some European countries. Several institutions in Turkey have support programmes but lack of coordination among these institutions often lead to inadequacy. In this context, the scope of the services of TPE and KOSGEB should be enlarged and a better coordination of these two institutions is required.

Special emphasis should be put on industrial design and utility model protection as two fields from which SMEs could benefit better. A better coordination between TPE, KOSGEB and universities could accomplish a lot in this respect.

As many of the SMEs are not aware of patent database and even if they are, they do not search through it, KOSGEB and TPE staff could train them about how to use patent database, which is a field really unknown although almost all of the firms interviewed have access to the internet.

Another attempt by TPE could be to have separate statistics for the SMEs in their data-base for structuring policies. This implementation can be made world-wide in all patent offices.

Although patent fees are very low in Turkey compared to European countries, Turkish SMEs cannot afford even those low fees as their turn-over is also low. Policies should encourage inventions and therefore necessary exemptions should be provided for innovative SMEs.

Special industrial areas in Turkey, namely technology development zones, organized industrial zones and small scaled industry estates, are where mostly SMEs are accumulated. Such an accumulation could be benefited in terms of IPR utilization as well as other policies. Consultancy provided by KOSGEB offices in many of these zones does not seem sufficient. Special dedication for IPR related services in these zones seems essential and this may be provided in collaboration with the administrations of these zones, TPE, KOSGEB and the Ministry of Industry and Trade. Apart from these zones, analysis and studies related to industrial clusters should include IPR awareness and assistance.

Another point indicated in the research is that the SMEs lack knowledge of how they can make use of a patented innovation. Firms seem to be unaware of benefits of IP protection and therefore they were not engaged in licensing, contracts and commercialization of their products. As a solution to this problem, KOSGEB supports should include post-grant consultancy. Similarly, pre-grant supports should be improved and both supports should be better announced.

Firms interviewed within the context of this study know less about WIPO and EPO than TPE. Turkish translation of WIPO web-site should be provided for better assistance to Turkish SMEs and this attempt could be initiated by TPE.

Although no specific complaints were raised for patent attorneys, better relationship between SMEs and attorney firms should be encouraged both by KOSGEB and by TPE. The system of selection and training of patent attorneys could be revised.

Since awareness about the IPR issues seems to be the most important reason for under-utilization, creating an innovative society is essential. In this respect, classes related to intellectual property should be included in programmes even in primary schools, not being limited to post-graduate programmes and to law schools. Students should be encouraged for innovation through projects for invention and IPR implementations. Visits to TPE and TPE staff visiting schools could help build awareness starting from early ages.

The survey carried out within the scope of this study could be developed in order to obtain the relevant data with respect to firm size, sectors and technological level of the firms as these categories could not be questioned due to the unevenness and less number of firms studied than expected. Further study could be helpful in designing better policies that could serve just at the right point and at the right time of requirement.

All these proposals indicate that a better integration of institutions should exist; not only for better IPR utilization of the SMEs, but also for better innovation policies and economic and technological development in general. IP policy and innovation strategy should be integrated. Cooperation between the state, universities, research institutes and business communities should be increased in order to promote an innovative culture. After all, there would be no patents where there is no innovation.

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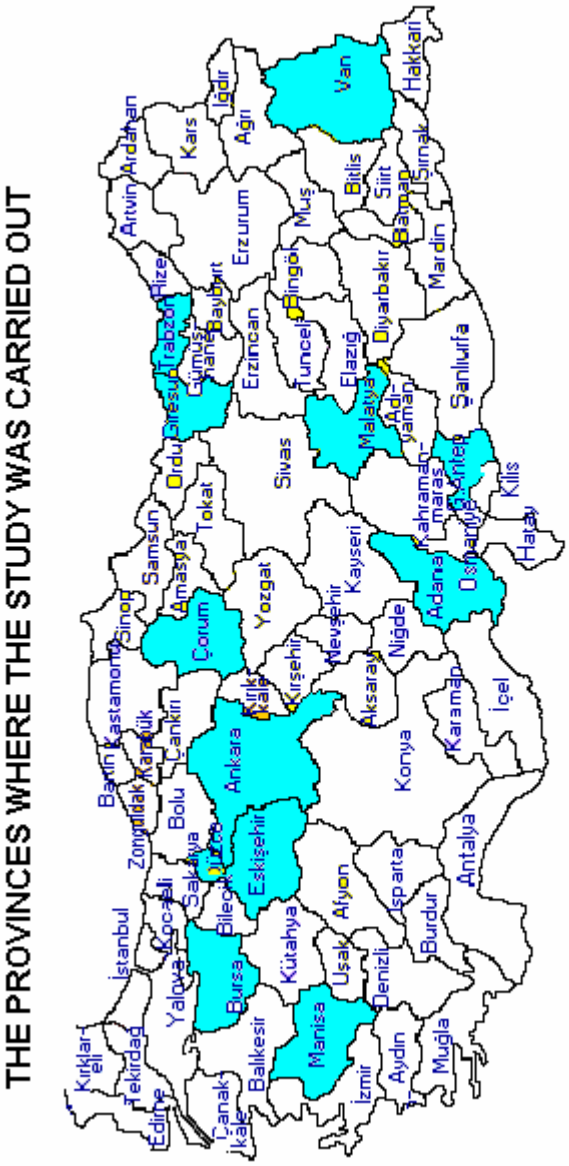
APPENDICES

APPENDIX A

Map Showing the Cities Where Interrogated OIZs are Situated



APPENDIX B

The Questionnaire

The results to be obtained from this questionnaire will be used for the thesis I am conducting within the scope of my post-graduate study at the Middle East Technical University, Science and Technology Policy Studies. It is essential that you fill in the relevant parts for statistical purposes, even if you have not developed a product, process or design.
Thank you for your time
Şebnem SÖZER
Tel: 312-2860365/2823
e-mail: sebnemso@sanayi.gov.tr

Name of firm :
Field of activity :
Number of employees :
Annual turnover :
Address :
Telephone :
e-mail address :

R&D:

1. Do you carry out R&D activities in your firm? If so, do you have a separate R&D department?
a) R&D performed……..…..□ b)R&D not performed ……..….. □
c) R&D department exists…… □ d)R&D department does not exist…..… □
2. Do you have access to internet?
□ Of your own……
□ Public use…….
3. Have you ever developed a new product, process or design?
a) Yes □ b) No □
4. Did the product, process or design that you have developed come out as a result of R&D? Could you tell us about that?

INTELLECTUAL PROPERTY RIGHTS

5. Do you know about the field of study of Turkish Patent Institute?
a) Yes □ b) No □
6. Do you know about the field of study of European Patent Office?
a) Yes □ b) No □
7. Do you know about the field of study of World Intellectual Property Organization?
a) Yes □ b) No □
8. Which of the below items do you know about?
Patent……. □ Yes □ No
Utility Model..…… □ Yes □ No
Trademark……. □ Yes □ No
Industrial Design..…… □ Yes □ No

What do you know about each of these items? Please explain.

9. If you have developed a new product, process or design, have you applied for a type of protection? If so, on what level?
a) National application…….. □
b) International application.……. □
c) Direct application in other countries…..… □
10. Did you hire a patent attorney for your application?
a) Yes □ b) No □
11. If you have not applied for a type of protection for your new product, process or design, what are the reasons for not applying?
□ Lack of knowledge
□ Procedures are too complicated
□ Procedures take too long
□ Fees for application and protection are too high
□ Other (Please specify)……..

12. If you applied for patent, utility model or industrial design protection, did you encounter any inconvenience during the procedures? If you did, which?
□ Application fees too high
□ Procedures take too long
□ Procedures are too complicated
□ TPE is not leading
□ Patent attorney is not competent and interested
□ Other (Please specify)……..

13. If you are granted patent, utility model or industrial design protection, did you encounter any inconvenience after grant? If you did, which?
a) Yes □ b) No □
If you did, which?
□ Protection fees are too high
□ Our invention was copied by our rivals because the documents were published
□ Our firm did not have any financial gain after grant
□ Other (Please specify)……..

14. Was your invention copied after grant?
a) Yes □ b) No □
Did you file a law-suit for that?
a) Yes □ b) No □
15. If your answer to question 14 is "yes", what kind of difficulties did you experience during the case? Please specify.

16. Have you ever been sued for an invention of yours? What was the verdict?

17. Do you have any colleagues who work at the same sector with you and who faced some inconvenience during patent, utility model or industrial design application? Could you explain if you know about such a case?

18. Do you have any colleagues who work at the same sector with you and who had financial gains after patent, utility model or industrial design grant? Could you explain if you know about such a case?

19. Do you know that you could license your product which is protected by patent, utility model or industrial design to another person or firm?
a) Yes □ b) No □
Would you consider the revenue of licensing as an incentive?
a) Yes □ b) No □
20. If you are granted patent, utility model or industrial design protection, did you have any gains after grant? If you did, which?

- □ Firm reputation
- □ Product reputation
- □ Enlargement of business
- □ Financial gains
- □ License agreement
- □ Other (Please specify)……..

21. If you had a license agreement for your protected new product, process or design, did you have consultancy for that?
a) Yes □ b) No □

22. Do you know that all patent, utility model or design applications are published in detail by the related institutions?
a) Yes □ b) No □
23. Did you search patent data base through the internet during development of a new product, process or design, before or after patent, utility model, trademark and industrial design application?
a) Yes □ b) No □

SUPPORTS
24. Have you attended organizations like seminars, training programmes about IPRs?
a) Yes □ b) No □

25. If you have, what kind of benefits did you get? Please specify.

26. Do you know about patent, utility model and industrial design support of KOSGEB?
a) Yes □ b) No □

27. Did you use that support? a) Yes □ b) No □
If you did not use that support, please state the reasons.

- □ I do not know the exact context of the support
- □ Procedures take too long
- □ Support is paid after grant
- □ Other (Please specify)……

28. Do you know about the consultant support of KOSGEB?
a) Yes □ b) No □

29. Do you know where that support can be utilized?
a) Yes □ b) No □
30. Did you use consultant support to hire a patent attorney?
a) Yes □ b) No □
31. Do you know bout the IPR support in technology development centers (TEKMER) of KOSGEB?
a) Yes □ b) No □
32. Have you made use of IPR support of any institution?
a) Yes □ b) No □
If you have which institutions?

- □ KOSGEB
- □ TTGV
- □ TOSYÖV
- □ Other (Please specify)……

33. If you used that support, do you think it was beneficial? Please specify.

APPENDIX C

The Questionnaire in Turkish

ANKET FORMU

Bu anketten elde edilecek sonuçlar, Ortadoğu Teknik Üniversitesi Bilim ve Teknoloji Çalışmalarında sürdürdüğüm yüksek lisansım için yürüttüğüm tez çalışmasında kullanılacaktır.
Ürün, üretim yöntemi ya da tasarım gerçekleştirmediyseniz bile bu anketin ilgili sorularını doldurup geri döndürürseniz, istatistiki bilgilerin oluşturulmasına katkınız olacaktır.
Zaman ayırdığınız için teşekkürler.
Şebnem SÖZER
Tel: 312-2860365/2823
e-posta: sebnemso@sanayi.gov.tr

Firma Adı :
Faaliyet Alanı :
Çalışan sayısı :
Yıllık ciro :
Adres :
Tel :
e-posta adresi :

AR-GE:

1. Firmanızda AR-GE yapılıyor mu? Yapılıyorsa ayrı bir AR-GE birimi var mı?

a) AR-GE yapılıyor…….. ☐ b) AR-GE yapılmıyor…….. ☐

c) AR-GE birimi var…… ☐ d) AR-GE birimi yok……..… ☐

2. Internet erişiminiz var mı?

☐ Kendinize ait……

☐ Ortak kullanım…….

3. Yeni bir ürün, üretim yöntemi ya da yeni bir tasarım geliştirdiniz mi?

a) Evet ☐ b) Hayır ☐

4. Geliştirdiğiniz ürün, üretim yöntemi ya da tasarım bir AR-GE çalışması ile mi ortaya çıktı? Bize kısaca süreci anlatabilir misiniz?

FİKRİ HAKLAR

5. Türk Patent Enstitüsü'nün faaliyet alanı ile ilgili bilginiz var mı?

a) Evet ☐ b) Hayır ☐

6. Avrupa Patent Ofisi'nin faaliyet alanı ile ilgili bilginiz var mı?

a) Evet ☐ b) Hayır ☐

7. Dünya Fikri Mülkiyet Organizasyonu'nun faaliyet alanı ile ilgili bilginiz var mı?

a) Evet ☐ b) Hayır ☐

8. Patent, faydalı model, marka ve endüstriyel tasarım konularından hangileri hakkında bilginiz var ?

Patent……. ☐ Var ☐ Yok

Faydalı Model…… ☐ Var ☐ Yok

Marka……. ☐ Var ☐ Yok

Endüstriyel tasarım……. ☐ Var ☐ Yok

Peki bunlar hakkında ne biliyorsunuz? Lütfen açıklayınız.

9. Varsa yeni geliştirdiğiniz ürün, üretim yöntemi ya da tasarımla ilgili koruma talebiniz oldu mu? Olduysa aşağıdakilerden hangisi düzeyindedir?

a) Ulusal Başvuru…….. ☐

b) Uluslararası başvuru……. ☐

c) Başka ülkede doğrudan başvuru…… ☐

10. Başvurunuzda patent vekili kullandınız mı?

a) Evet ☐ b) Hayır ☐

11. Yeni geliştirdiğiniz ürün, üretim yöntemi ya da tasarımla ilgili koruma talebiniz olmadıysa nedeni nedir?

☐ Konu hakkında bilgimizin olmaması

☐ İşlemlerin karışık olması

☐ İşlemlerin uzun sürmesi

☐ Başvuru ve koruma ücretlerinin yüksek olması

☐ Diğer (Açıklayınız)……..

12. Patent, faydalı model, marka ve endüstriyel tasarım başvurusunda bulunduysanız, başvuru sırasında olumsuz deneyimler yaşadınız mı? Yaşadıysanız aşağıdakilerden hangilerini?

☐ Başvuru ücretlerinin yüksek olması

☐ İşlemlerin uzun sürmesi

☐ İşlemlerin karmaşıklığı

☐ Türk Patent Enstitüsünün yeterince yol gösterici olmaması

☐ Patent vekilimizin yeterince bilgili ve ilgili olmaması

☐ Diğer (Açıklayınız)…….

13. Patent, faydalı model, marka ve endüstriyel tasarım koruması aldıysanız, koruma hakkının elde edilmesinden sonra olumsuz deneyimler yaşadınız mı?

a) Evet ☐ b) Hayır ☐

Yaşadıysanız aşağıdakilerden hangilerini?

☐ Koruma ücretlerinin yüksek olması

☐ Buluşumuzun yayınlanmasından dolayı rakiplerimizce kopyalanması

☐ Koruma aldıktan sonra bunun firmamıza maddi bir kazanç getirmemesi

☐ Diğer (Açıklayınız)…….

14. Patent, faydalı model, marka ve endüstriyel tasarım koruma hakkının elde edilmesinden sonra buluşunuzun kopyalanması durumu yaşandı mı?

a) Evet ☐ b) Hayır ☐

Bunun için mahkemeye başvurdunuz mu?

a) Evet ☐ b) Hayır ☐

15. 14. soruya evet cevabını verdiyseniz, mahkeme sürecinde ne gibi güçlükler yaşadınız? Lütfen açıklayınız.

16. Bir buluşunuzla ilgili dava edildiniz mi? Dava nasıl sonuçlandı?

17. Sizinle aynı işkolunda faaliyet gösteren sanayicilerden patent, faydalı model, marka ve endüstriyel tasarım başvurusunda bulunup olumsuz deneyimler yaşayanlar var mı? Bu konuda bilginiz varsa açıklar mısınız?

18. Sizinle aynı işkolunda faaliyet gösteren sanayicilerden patent, faydalı model, marka ve endüstriyel tasarım koruması alıp kazanç sağlayanlar var mı? Bu konuda bilginiz varsa açıklar mısınız?

19. Patent, faydalı model ve endüstriyel tasarım koruması aldıktan sonra bu hakkınızı lisans anlaşmasıyla başka bir kişiye ya da firmaya lisans verebileceğinizi (kiralayabileceğinizi) biliyor musunuz?

a) Evet ☐ b) Hayır ☐

Bunun size sağlayacağı getiriyi, bu işler için bir teşvik unsuru olarak görür müsünüz?

a) Evet ☐ b) Hayır ☐

20. Patent, faydalı model, marka ve endüstriyel tasarım koruması aldıysanız, koruma hakkının elde edilmesinden sonra bir yarar sağladınız mı? Sağladıysanız aşağıdakilerden hangilerini?

- ☐ Firma adının duyulması
- ☐ Ürün adının duyulması
- ☐ İş hacminin artması
- ☐ Maddi kazanç
- ☐ Lisans anlaşması
- ☐ Diğer (Açıklayınız)…….

21. Yeni geliştirdiğiniz ve koruma hakkı aldığınız ürün, üretim yöntemi ya da tasarımla ilgili lisans anlaşması yaptıysanız, bununla ilgili danışmanlık aldınız mı?

a) Evet ☐ b) Hayır ☐

22. Dünyada başvurusu yapılmış patent, faydalı model, marka ve endüstriyel tasarım bilgilerinin detaylı olarak ilgili kurumlarca yayınlandığını biliyor musunuz?

a) Evet ☐ b) Hayır ☐

23. Ürün, üretim yöntemi ya da tasarımın geliştirilmesi sırasında, patent, faydalı model, marka ve endüstriyel tasarım koruması talebi öncesinde ve sonrasında başvurusu yapılmış/koruma almış benzer ürünleri internet üzerinden veya ilgili kurumlarda araştırdınız mı?

a) Evet ☐ b) Hayır ☐

DESTEKLER

24. Fikri mülkiyet ile ilgili seminer, eğitim programı gibi organizasyonlara katıldınız mı?

a) Evet ☐ b) Hayır ☐

25. Katıldıysanız ne tür bir verim aldınız? Lütfen açıklayınız.

26. KOSGEB'in patent, faydalı model ve endüstriyel tasarım tescil desteği hakkında bilginiz var mı?

a) Evet ☐ b) Hayır ☐

27. Bu destekten yararlandınız mı? a) Evet ☐ b) Hayır ☐

Yararlanmadıysanız nedeni nedir?

- ☐ Desteklerin kapsamının yeterince bilinmemesi
- ☐ İşlemlerin uzun sürmesi
- ☐ Desteğin koruma sağlandıktan sonra ödenmesi
- ☐ Diğer (Açıklayınız)……

28. KOSGEB'in danışman desteği hakkında bilginiz var mı?

a) Evet ☐ b) Hayır ☐

29. Danışman desteğinin nerelerde kullanılabileceğini biliyor musunuz?

a) Evet ☐ b) Hayır ☐

30. Danışman desteğini patent vekili tutmak için kullandınız mı?

a) Evet ☐ b) Hayır ☐

31. KOSGEB'in Teknoloji Geliştirme Merkezleri'ndeki (TEKMER) fikri haklar danışmanlığı hizmeti hakkında bilginiz var mı?

a) Evet ☐ b) Hayır ☐

32. Herhangi bir kuruluşun fikri ve sınai haklar desteklerinden yararlandınız mı?

a) Evet ☐ b) Hayır ☐

Yararlandıysanız hangileri?

- ☐ KOSGEB
- ☐ TTGV
- ☐ TOSYÖV
- ☐ Diğer (Açıklayınız)…….

33. Yararlandıysanız olumlu sonuç aldınız mı? Açıklayınız