专利制度与经济增长

——兼论中国专利制度的绩效

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——On the Performance of China's Patent System

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一、引　　言

法律效益主要体现在法律制度运行的绩效上，衡量法律效益的主要因素是法律规范实施的结果符合立法目的，法律作用的结果客观上保障

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† For English summary, see page 12.

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并促进了生产力的进步和社会发展[1]。实证分析是考察法律制度运行绩效的一个有效方法,它可以使制度运行研究尽可能精确和定量化,并弥补传统定性分析为主要方法的不足。我们可以将运行过程中的要素作为分析变量,使制度的运行过程透明起来。但法律制度分析毕竟不是单纯的数学问题,量化分析必须与质态分析相结合。在本文中作者将按照理论与实证结合的思路对中国专利制度的运行绩效进行分析,并通过对中国专利制度运行的效果评估,发现专利制度运行中的问题,提出进一步完善法律制度及政府管理的措施。

二、对专利制度目的的理论分析

考核法律制度运行的绩效,最直观的方法是考量设计制度时所确立的目的实现效果。具体到专利制度的目的,从 1883 年最早涉及保护专利权的《巴黎公约》中就已显示得十分明了:保护工业产权。[2] 经过百余年专利制度的运行与完善,至 1995 年 WTO 的《知识产权协议》中确立的目的是:促进技术的革新、技术的转让与技术的传播,以有利于社会及经济福利的途径、促进技术知识的生产者与使用者互利,并促进权利与义务的平等。[3] 我们可以发现一个明显的变化,从制度初始的单纯保护权利到后来更为有效地保护权利和更为重视社会公共利益,即,专利制度立法理念已从个人本位向社会本位转移,公共利益与权利人的利益平衡成为专利制度的立法基点,制度对经济发展的作用成为重要的目的之一。这一变化同样在我国的专利法中得到反映:为了保护发明创造专利权,鼓励发明创造,有利于发明创造的推广应用,促进技术进步和创新,适应社会主义现代化建设需要,特制定本法。[4] 从上述规范中可以

1 李晓安:《法律效益探析》,载《中国法学》 1994 年第 6 期。
2 《巴黎公约》第 1 条第 1 款。
3 Trips, Article 7, Objectives.
4 《中华人民共和国专利法》第 1 条。

分解出考察专利制度运行绩效的两个主要指标 其一,从个人权利的角度,专利制度的设立能否全面有效地保护专利权人的利益,使得在这种制度环境下他们的聪明才智得到回报,从而激励创新 其二,从社会利益的角度,专利制度是否对科技进步和创新的传播及应用提供了一个畅通的管道,使之能提高企业的生产率,进而促进一个国家产品总量和人均值的增长。

(一)有关专利制度对创新是否具有激励作用的争论在 19 世纪就已经展开

早期的学者边沁和穆勒主张专利权的设立是有利无害的，他们认为,专利制度保障了知识资产的私人产权,而将知识资产的产权界定为私有是有效率的,它可以鼓励发明创造 陶西格和庇古则认为,专利制度对发明数量的增长毫无帮助,发明是自发行为,故专利制度的保障和发明数量的增长没有关系 阿罗主张,知识资产是公共物品,其边际成本为零,如果将知识资产私有化,会在边际上增加成本,从而减少发明的使用和推广,故专利权有害无益。这些观点都带有其鲜明的时代烙印。

财产权的法律保护就在于产生有效益地利用各种资源的激励。[5] 专利制度实质上是一种利益制度,它对人们在发明创造中的利益关系加以选择和确认,并通过国家授权形式确立利益关系,使发明创造者的智力资源得到更有效利用,从而提高了整个社会的创新效益。而确立和保护产权,通过对有限资源的有效利用来提高整个社会的经济效益,正是产权和效益关系的最经典的结论。所以,专利制度是对产权和效益关系的一个完美诠释。专利制度是“制度文明的典范，是激发创造力的加速器。”[6]专利制度及其整个知识产权制度的建立,实现了私权制度的体系

5 Bosiner, Economic Analysis of Law. Boston: Little, Brown and Company. 3rd ed. 1986, p30.

6 刘春田：《知识产权法》，高等教育出版社、北京大学出版社 2000 年版，第 19 页。

化,[7] 但其贡献不仅仅在此。由于私权的优势在于它具备充分的内部性，私有者的决策取向是以对未来收益最大化的方式使用资源，并且成本的私人承担也使私有者要作出仔细考量。因此,与具有较大外部性的共有产权和国有产权制度相比，作为私权制度的专利制度具有更有效的激励机制。“知识产权是私权。”[8] 这不仅仅是 WTO 对在多数国家的法律中很久以来就得到承认的事实的一次重申,也表明 WTO 成员对纳入世界贸易体制的知识产权制度安排的认同。

(二)专利制度绩效考察的第二个方面是对经济增长的影响

国家的政治法律制度决定经济自由度和个人行为特征，进而作用于经济绩效。我们可以从经济增长的动因分析起,反证制度的绩效。有关经济增长影响的核心要素的学说,主要有资本决定论、技术进步论、人力资本论、专业化人力资本与特殊知识积累论四大主要西方经济增长理论派别。资本决定论的主要结论是经济增长的快慢取决于投资规模的大小和资本产出率的高低，这种惟资本论学说与工业经济时代西方国家的现实相当吻合,在 20 世纪 50 年代前受到推崇。随着以计算机技术应用为主要标志的第三次科技革命的来临，资本决定论逐渐失灵。索洛(R.Solow 等人在 80 年代初创立了技术进步论,其主要贡献是区分了由要素量增加所产生的“增长效应”与由要素技术水平提高所产生的“水平效应”这两种经济增长的不同诱因。丹尼森(E.F.Denison)的实证分析也表明影响增长的经济因素主要有七类,“知识进展和它在生产上的应用”是增长的主要来源之一。而舒尔茨 (T.W.Schults)提出的人力资本论则更为关注“人力”因素,主张由教育、卫生等人力资本投资所产生的效应才是现代经济增长的主要动力。但索洛和舒尔茨理论中将技术进步与人力资本作为系统的外部变量，其变动具有偶然性，无法对 20

7 吴汉东：《科技、经济、法律协调机制中的知识产权法》，载《法学研究》2001 年第 6 期。

8 Trips, Preface.

世纪以来经济的长期稳定增长作出解释。20世纪80年代中期,罗迈尔(P.Romer)与卢卡斯(R.Lucas)将其理论中作为外部变量的技术进步与人力资本内在化,提出了专业化人力资本与特殊知识积累论的新增长理论,得出了一国的人力资本存量、人力资本的生产率与经济增长速度成正比的结论。"新增长理论"还特别强调一般知识与专业知识、原始劳动与专业化人力资本的区别,指出决定经济增长的主要因素是专业知识和专业化人力资本,而不是一般知识及一般人力资本。[9]

上述理论的演进过程反映了一个共同的结论:知识要素正在成为经济增长的核心因素。尤其是在"新增长理论"中明确将知识划分为一般知识与专业知识,人力资本分解成一般化人力资本和专业化人力资本,这恰好印证了知识产权制度中专有领域的知识区别于公有领域的知识、创新劳动区别于原始劳动的思路。创新的产物——知识产权正是获得竞争优势的关键,是经济增长的主要诱因。但技术进步与人力资本内在化就能诠释经济的持续增长吗?"新增长理论"是基于"市场激励而致的有意识行为的结果"假设,这一假设的成立必须以一定的制度环境为前提。笔者认为,专业化人力资本是影响增长因素链条中的关键一环,却不是根本要素。同一个人在不同的制度背景下会有不同的选择:一个四里八乡闻名的懒汉却在承包后的土地上勤奋地科学耕作,一个软件奇才可能苦于盗版而沦为游手好闲之辈——专业化人力资本和一般人力资本也是可以转换的,它依然是一个具有随机性、偶然性的因素。同样,体现科技进步的那些创新技术,如果只是出自于创新者的自发行为,缺乏持续动力的创新具有随机性、间断性,对经济增长的影响也具有偶然性,自然难以成为持续经济增长的决定因素。

我们还是要回到斯密的"经济人"思想上,在斯密的体系中,经济人的自利是其行为理性的保证。制度的确立不仅可以限制人的行为,也

9 侯荣华:《西方宏观经济学》,中国计划出版社 1996年版,第270—295页。

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可以激发人的行为。知识产权制度正是利用人的趋利性,赋予创新者在竞争中的垄断权,激发人们持久的创新热情,使原本非功利的、偶然的创新活动获得持续的动力,从而激励创新产生,推进创新技术的转化,进而促进经济增长。因此,我更赞同制度在内生经济增长中的决定性作用。[10]

三、对中国专利制度运行绩效的实证分析

在对专利制度绩效的理论分析的基础上,我们把不能直接比较的数字变为可比数字进行实证分析。国内生产总值作为衡量该国经济发展的量度,是国际上广泛接受的。专利申请和授权数可以被看作是国家专利制度的合适的量度。我们将主要利用回归分析中的相关性分析方法对中国专利制度的绩效进行评价。

(一)专利制度对创新的激励效果分析

从表 1 的显示中我们可以直观地看到,从 1985 年中国专利制度运行以来,专利申请与授权数呈持续增长趋势,专利申请的年均增长率达到 17.9%。这表明专利制度对创新的激励产生了显著的效果,同时也反映出公众对专利制度法律保障的信心。

专利申请数和专利授权数增长同时在 1993 年出现了一个峰值,这是对 1992 年专利法第一次修改中将"药品、化学物质"及"食品、饮料和调味品"以及"微生物"纳入专利保护范围的一个积极回应。这次修改中,还将专利方法的效力延伸及于依照该方法直接获得的产品,并增加了进口权,延长了专利权的保护期限,使专利权的保护水平有了明显提高。这一事实说明制度的完善程度与制度效用是相关的。

10 L·E·戴维斯、D·C·诺斯:《制度变迁的理论:概念与原因》,载《财产权利与制度变迁》,上海三联书店、上海人民出版社 2000 年版。

表 1　中国专利申请数、授权数与国内生产总值

年　份	专利申请数	专利授权数	GDP
1985	14372	138	8964.4
1986	18509	3024	10202.2
1987	26077	6811	11962.5
1988	34011	11947	14928.3
1989	32905	17129	16909.2
1990	41469	22588	18547.9
1991	50040	24616	21617.8
1992	67135	31475	26638.1
1993	77276	62127	34634.4
1994	77735	43297	46759.4
1995	83045	45064	58478.1
1996	102735	43781	67884.6
1997	114208	50996	74462.6
1998	121989	67889	78345.2
1999	134239	100156	81910.9
2000	170682	105345	89404.0
2001	203582	114252	95933.0
2002	252632	132401	102397.9

数据来源：

国家知识产权局，《专利统计年报》（1985—2001年）

国家统计局网站：www.stats.gov.cn/sjjw/ydsj/

从近几年国内专利申请的构成我们也可以发现一些可喜的变化。从三种专利申请量看，发明专利的申请量大幅度提高，2002年比上年增长27%，占国内申请总量的比例达到31.76%。发明专利申请比重的明显增加，反映出社会整体科技水平的提高。2001年企业的发明专利职务申请量已占国内同期发明专利申请量的63.3%。[11]这显示出企业作为技术创新的主体创新热情显著增强。

(二)专利制度对经济增长的影响分析

在对中国专利制度对经济增长作用的评估中，笔者拟采用两个步

11　根据国家知识产权局2001年、2002年专利统计年报提供的数据计算。

骤 第一,是按纵向的时间序列进行宏观分析,以检验专利制度对中国经济增长是否具有持续的促进作用 第二,是多个时间点上的横截面的结构分析,以发现专利保护对象中对经济增长影响的优势因素。

1. 图1 中提供了从 1985—2001年中国专利授权数和国内生产总值,我们采用回归分析的方法检验两个变量间的相关性。利用图 1 数据计算相关系数 r 得：$r = 0.927055024$

在设定置信度为 99%时,临界值 $r_0 = 0.632$,则 $r > r_0$,两组样本值呈强相关。从运算结果和依据原始数据作出的图 1 中,可以得出我国的专利授权数和国内生产总值相关性显著。

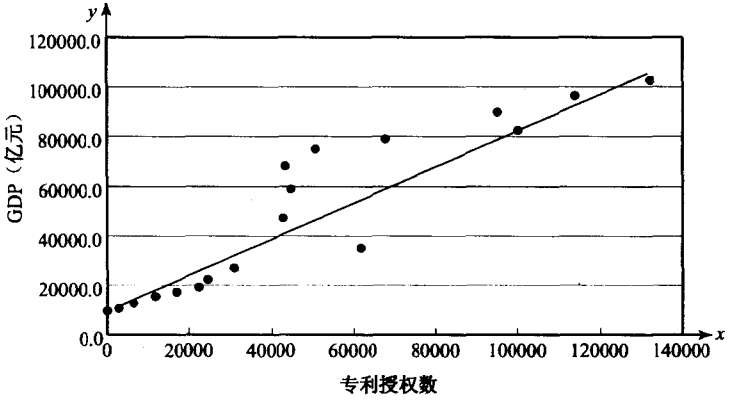

图 1 专利授权数对国内生产总值

进一步求得 y (国内生产总值)对 x (专利授权数)的样本线性回归方程为：

$$y = 0.774989x + 10192.87$$

据此,我们可以得出专利授权数越高对我国经济增长的贡献率越大,且专利授权数每增加一个单位对应预计 0.77 个单位的国内生产总值增长,专利制度对经济增长具有持续地促进作用。

2. 取时间点 1996 年我国 31 个省、自治区和直辖市在当年的发明、

实用新型、外观设计专利授权数 $\{x_{1i}\}$，$\{x_{2i}\}$，$\{x_{3i}\}$ 构成 3 个数据列，$\{y_i\}$ 为当年各地区的国内生产总值数据列，i = 1，2，……，31，则 (x_{1i}, y_i)，(x_{2i}, y_i)，(x_{3i}, y_i)是三种专利授权数与国内生产总值的 3 组各 31对样本值，分别检验 3 组变量间的相关性，得：

发明与 GDP 的相关系数：$r_1 = 0.3937463$

实用新型与 GDP 的相关系数：$r_2 = 0.7198289$

外观设计与 GDP 的相关系数：$r_3 = 0.6690497$

进一步对 1997—2001 年我国各地区数据进行检验，可以得到各组变量的相关系数图示如下：

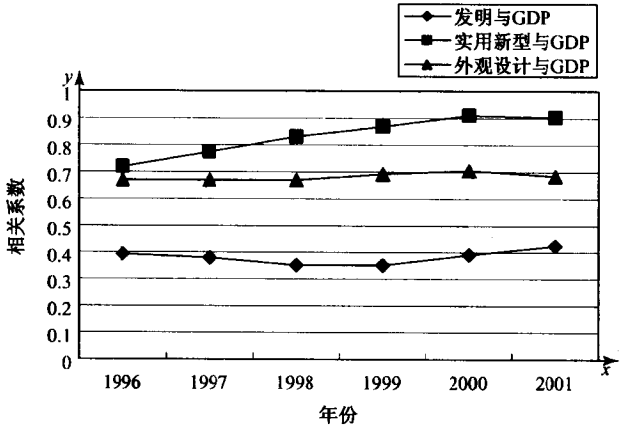

图 2　近几年我国各地区三类专利授权数与 GDP 的相关性

上图显示出各地区三类专利授权数与国内生产总值的相关系数具有显著的一致性和稳定性，且均大于零。其中，实用新型、外观设计授权数与国内生产总值有高且稳定的相关性，但发明专利授权数与生产总值的相关性明显低于前者。相关性检验的结果表明 技术创新对经济增长的促进作用进一步得到证实，但不同类型的创新对增长的影响力是有区别的。实用新型、外观设计专利与国内生产总值的高关联度反映了这两

类创新技术对经济增长的贡献率要远远高于发明专利。由于实用新型专利更能反映企业的工艺创新能力，外观设计较直观地体现企业的市场创新能力，而发明专利标志企业的产品创新能力。所以，这从另一个角度反映出现阶段我国企业依赖创新获得市场竞争优势还主要维持在对产品工艺的改进和式样的更新上，缺乏产品的创新。从我国发明专利的比例也可说明这一现状，在发明专利授权比例最高的 2002 年也仅占当年国内外授权总数的 16%，这与一些发达国家发明专利在专利构成中的主导地位的情形截然相反，[12]这个比例中还包括了国外公司的大量发明授权，而同年国内各地区发明专利授权数仅占总数的 4.4%，这已非常明显地反映出我国企业在核心竞争力上存在的隐患。

四、结论及启示

我国从 1985 年正式实施专利法至今才 17 年，尽管专利制度在我国的运行时间并不长，但这种经过工业化国家几百年实践检验的制度，同样在中国短暂的实践中获得很好的效果。制度文明是人类的共同财富，是物质文明与精神文明的基础，合理地选择和引进对我国经济建设将会有显著的推动作用。

(一)由于专利法所调整的对象 —— 创新技术有别于其他法律的保护对象，是一个异常活跃的因素，新技术的出现及利用必然对社会利益的划分产生影响，专利法及相关知识产权法律制度必须及时对新的利益关系进行调整，故对专利权内容的完备、保护客体的增加、保护措施的及时完善等都是必要的。因此，在社会经济发展水平和科技进步程度变

12 日本发明专利的授权数占授权总量的比例 1996—2001 年分别为：62%，63%，67%，70%，71%，74%，呈上升趋势。根据日本特许厅网站 http://www.ipdl.jpo.go.jp/提供的数据计算。

化的同时，及时调整、完善专利制度对提高制度的绩效是有明显效果的。所以，专利制度同它的保护对象一样应该不断创新。专利法的不稳定性是这种法律制度的一个基本特征，我们应该适应专利制度的这种特点，并在立法和司法中注意其规则的特性，而不应生硬地将其纳入某一稳定框架，带来无穷遗患。

（二）一些国家的专利法和国际条约并不保护实用新型专利，而我国的专利法中确立了这种保护对象，并获得满意效果，这与我国现阶段整体技术创新水平是一致的。但实用新型与外观设计的兴旺也反映出在创新问题上社会整体的浮躁，将发展寄希望于市场的短期迅速的回报，而对投入大、开发周期长的发明缺乏应有的热情和长远的期待。这表明创新过程中不仅存在“市场失效”，甚至也显现“制度失效”。而政府的管理在这里是可以有所作为的：构建国家创新体系的合理结构，提高对基础研究及高科技开发的支持，以弥补市场和专利制度本身所无法解决的问题。此外，国家机关对知识产权进行管理是知识产权制度区别于其他财产权制度的特征之一，政府应通过对专利法不同保护对象保护水平的调整及运用审查机制来优化专利技术的结构，提高发明创造的质量，提高市场主体的核心竞争力，确保科技对经济增长持续稳定的促进作用。使我国既是专利大国，也能成为专利强国。

（三）专利制度提供了一个激励技术创新产出最大化的机制，但产出最大化并非一定就利润最大化。专利技术是处于市场边缘的技术，仅具有潜在的市场价值。而专利技术的扩散与使用正是将潜在价值转化为现实价值即专利制度促进经济增长的关键步骤。前面的数据分析表明我国发明专利的转化率不容乐观。而在某些发达国家（如日本）技术扩散对经济增长的贡献已经超过直接 R&D 的贡献。因此，制度和管理的着眼点在加强创新技术的生产的同时，不应忽视技术的扩散，否则将会影响专利制度的绩效。当然，转化不仅仅是专利法就能解决的，这是一个综合问题，需要企业家的选择，风险基金的投入，市场的有序竞争及政

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府的规范管理等。所以，发挥专利制度的作用，不仅仅是司法机关对财产权的静态保护，动态的扩散、管理及协调都是制度绩效的增效剂。

Patent System & Economic Growth

——On the Performance of China's Patent System

Liu Hua *

1. Introduction

Evaluation on the performance of a legal system is a fundamental method to examine, create or select the rationality of the system. The executive course of the system will be a black box simply with a descriptive analysis. In that case, we may only have a superficial understanding about the origin—legal system and the terminus—utility. It's helpless for the perfection of rule by law. Proof analysis, on the contrary, is an effective way to study the performance of systems by overcoming the drawbacks of traditional qualitative analyses. It makes the study as accurate and quantitative as possible. Since those factors can be treated as analytical variables, the executive course of systems becomes transparent. It should be noted that a legal system analysis is not merely a mathematical problem and quantitative analyses must be combined with qualitative analyses. According to the above ideas, the aut-

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hor makes an appraisal on the dynamic utility of China's patent system so as to find out the problems occurred during its executive course, and thereby put forward some measures to further improve the system and government administration.

2. Theoretical analysis on the objectives of patent system

The most straightforward approach to measure the dynamic utility of a legal system is to evaluate the actual effects of the objectives established by the system. With a view to the objectives of the patent system, the international treaty, Paris Convention for the Protection of Industrial Property, referred to the protection of patent rights for the first time as early as in 1883, and clearly stated that industrial property rights were protected.[1] Patent system has been in practice for over a hundred years. The WTO affirmed its purpose in 1995 in Agreement on Trade-Related Aspects of Intellectual Property Rights: "The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."[2] From above statement we notice an apparent change in patent system from pure protection of rights to the combination of more effective right protection with public interests, that is, a change from right standard to the combination of right standard with society standard. Balance between public interests and right holders' interests became the foothold of patent system. The positive function of patent system in promoting economy became one of its major objectives. Such changes are also reflected in China's patent law: "This law is enacted to protect for invention-creations, to encourage invention-creation, to foster the spreading and application of invention-creations, and to promote the development and innovation of science and technology, for meeting the needs of the

1 Paris Convention for the Protection of Industrial Property, Article 1, clause 1

2 Trips, Article 7, Objectives.

construction of the socialist modernization."[3]

From the above statement, the appraisal on the dynamic utility of patent system can be divided into two parts: Firstly, in terms of individual rights, whether a patent system can protect the interests of patent right holders so that their intelligence can be paid off under such system and hence innovations are greatly encouraged. Secondly, in terms of social interests, whether a patent system can provide an unimpeded channel for science & technology advances and the dispersion & application of innovations; whether it can elevate a nation's productivity and increase its DNP & product per capita. The nation's economic development is actually the supreme objective of patent system.[4]

2.1 As early as in the 19th century, when the patent system was initiated, the dispute on the first part had already arisen. The scholars of early stage like J. Bentham and J. S. Mill believed that the establishment of the patent system did more good than bad. They held that patent system provided a shelter for private rights of intellectual property, and it was efficient to define intellectual property as private property. Such an action might encourage invention-creations. Their view is widely accepted by many scholars of the present days when patent system has matured. Another view is that patent system has no positive influence on the quantity of inventions. F. Taussig and A. C. Pigou argued that invention was a spontaneous behavior of human beings, and the practice to protect patents had no relation with the numerical increase of inventions. A converse opinion held by K. Arrow is that intellectual property is public property with zero marginal cost. The personalization of intellectual assets will result in increasing marginal cost and hence the cutback of the application and dispersion of inventions. Such a view derived from his concentration on the marginal cost of pa-

3 Patent law of the People's Republic of China, Chapter 1 General Provision, Article 1.

4 Liu Maoling, Economic Analysis on Intellectual Property Law, Publishing House of Law, 1997, p.6.

tent application. It aimed at saving social total cost but ignored trading cost caused by the commercialization of inventions, which is the foundation of such property patent rights. In history, some western countries (e. g. Holland), which once abolished patent law according to the above theory in the 19th century, restored it in the 20th century. The fact fully illustrated that the third opinion had already been denied by history. The second opinion mentioned above has its historical background. No matter it is in history or in present, there are numerous inventions, which have no direct connection with markets. They are probably out of the inventors' inspiration or non-profit pursuit. However, in the highly developed market economy, the intellectual property system enables all the patent holders to gain considerable recompenses. It is an indispensable means to stimulate innovations.

Bosiner believed that legal protection for property rights was in that it was able to realize efficient utilization of various resources.[5] In essence, the patent system is a system of interests. Although the system itself doesn't create interests, and its function is merely to select and identify the interest relationships among people involved in innovations, it is the patent system that makes it feasible to utilize inventors' intelligence more efficiently through the interests relationship/legal relationship established by national authority. The overall efficiency of innovations is hence improved. Actually, the classical conclusion about the relationship between property rights and efficiency is to improve the overall economic efficiency through effective utilization of the limited resources on the basis of property rights protection. Therefore, patent system is a perfect illustration for the relationship between property rights and efficiency. It is the pattern setter of regime civilization and the accelerator of innovations.[6] The establishment of patent system

5 Bosiner, Economic Analysis of Law. Boston: Little, Brown and Company. 3rd edition 1986, p. 30.

6 Liu Chuntian, Intellectual Property Law, High Education Publishing House, 2000, p. 19.

and the general system of intellectual property systematized private rights.[7] But its contribution is far more than that. Because the advantage of private rights is in its adequate internality, the objective of private decisions on resources utilization is to maximize their future profits. At the same time, the personal assumption of the costs forces owners of private property to think carefully when they are making decisions. Therefore, compared with the public property and national property systems of greater externality, patent system, as a private property system, is a more effective incentive mechanism. "Intellectual property is private right."[8] The WTO not only reconfirms a fact that has been admitted in many countries laws long ago, but also shows its firm belief in embracing intellectual property system in the world trade system."

2.2 The second part of the utility inspection is focused on the economic effects of patent system. As a code of behaviors, law is a product of society as well as economy. The political and the legal systems of a country restrain its economic freedom and individual conducts, and thus function on its economic utility.

The following economic analyses demonstrate the positive functions of patent system on economic growth.

Patent system gives an impetus to the boom of innovations. Accompanying the trend, come about much more profitable investment opportunities than traditional technological industries. The capital output ratio is growing and the marginal profits are hence increasing progressively. As a result, economic activities achieved a long-term continuing growth by breaking through the short-term confinement. Therefore, patent system is capable of creating the progressive increasing effect on the marginal profits of innovation input.

7 Wu Handong, Intellectual Property Law in the Coordination Mechanism of Science, Economy & Law, Law Study, 6th issue, 2001, p. 133.

8 Trips, Preface.

The costs of innovation consist of costs of R&D, licensing agreement, technology dispersion and application of innovations. The costs of R&D are the fixed costs of the early phase and have no relevance with the number of licensees and production scale of licensed technology, while the costs of technology trade, dispersion and application do. They change in the same direction and constitute the liquid costs. Because the fixed costs of innovation do not vary with production output, the same technology can be used repeatedly and the scale of technology utilization and the number of users are not restricted in theory, the costs of R&D remain unchanged in spite of overproduction. Such quality of R&D costs causes the long-term marginal cost of innovation to decline progressively. And it also gives innovators an internal economic motive during the course of conversion from innovative technology into actual productivity. It is particularly appealing to business firms, which are in pursuit of maximum profits. Business firms are the body of innovating activities in many countries where patent system has been founded. Successful firms possess more patent rights than those ordinary ones and thus possess the core competitiveness to gain comparative advantage. Due to the economic rationality of patent system, it directly takes effect on business firms, the nuclear force of a nation's economic growth. Various recompenses for firms' innovation input are guaranteed by patent system and constitute the main part of the increased amount of GDP.

3. Proof analysis on the performance of China's patent system

On the basis of theoretical analyses on the utility of patent system, the figures incapable of direct comparison can be converted into comparable ones. In this way, a proof analysis is feasible. It is internationally accepted to use the GDP as the measurement of a nation's economic growth. Moreover, the number of patent applications and grants in a nation can be used as an adequate measurement of the nation's patent system. Although other indicators are available, the former is

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