

# **THE INTERFACE BETWEEN COMPETITION AND INTELLECTUAL PROPERTY POLICY**

## **The Role of Competition Agencies**

### **I. Introduction**

This paper examines the interface between competition policy and intellectual property policy. It is often said that there is a tension between these policies, as competition policy is generally opposed to monopolies, and intellectual property is deemed to support them. However, this tension is based on a series of assumptions which we do not believe are accurate. Rather, both policies have the same fundamental goal, which is to ensure the stimulation of innovation.

In addition we will examine the role that competition agencies play in this and other areas in the wider economic context. Competition advocacy is a vital part of the job of all competition agencies, and it is critical in advocating for competition policy as an organizing principle, competition agencies advocate for competition in the true sense of the term. Competition is a widely misunderstood term and is frequently used by organs of government as a justification for particular policies that are very often anti-competitive. It is critical that competition agencies, expressing a consumer welfare enhancing approach to competition policy, educate other government ministries about the nature of competition.

### **II. Competition Advocacy**

Competition agencies should advocate for competition with all branches of government. Competition agencies should promote a vision of competition that promotes consumer welfare enhancement. This vision is particularly important when it comes to the role of intellectual property and the question of incentives for innovation in a market such as that of Korea. Korea is characterized by advanced manufacturing, where there is significant scope for efficiency gains as a result of innovation. It is critical that Korea's competition and intellectual property policy together deliver these innovation gains, and that this be done in the wider context of overall economic policy. As the competition agency goes about its competition advocacy mandate, it should bear the points raised in this paper in mind.

### **III. Myths regarding Intellectual Property Rights**

According to one myth, intellectual property rights, in particular the patent right, is a government grant of temporary monopoly status. This deviation from the ordinary rules of competition is allowed because of the need to stimulate innovation.

Another myth provides that that the goals of competition policy and intellectual property are opposed. Intellectual property, so the myth runs, is designed to grant an anti-competitive monopoly over information, whereas competition policy is focused on getting that information out, and is opposed to monopoly.

#### **IV. The Reality**

Intellectual property rights are actually granted by governments to recognize a pre-existing property right. This is because the patent right is a sub class of property rights. It thus inures to the benefit of the patent owner, even absent a government existing to grant the right. In this regard, an analogy might be drawn to the existence of property rights arising in the Spitsbergen archipelago (Svalbard) prior to the assertion of a land right by the Kingdom of Norway.<sup>1</sup> In this case American mining companies claimed mining rights based on their drilling prior to Norway's assertion of a property right over the land. As the work done by the mining companies gave rise to the mining right, such a right could exist where no government lay claim to the land. On the other hand, if the right arises because a government grants the right, then in the absence of a government, no right can exist. Hence the mining companies would have no rights to the fruits of their labor. In the ultimate Treaty (See FNI), the acquired rights of these nationals were explicitly recognized, even though they existed when there was no government in Svalbard

Competition policy and intellectual property policy both have the same welfare enhancing goals. These objects are intended to enhance consumer welfare in the economic sense, i.e. to promote allocative and productive efficiency. In particular, intellectual property policy is designed to incentivize the very type of innovative activity that tends to increase dynamic efficiency. In broad terms, dynamic efficiency gains arise for future consumers and are usually secured by innovations, establishing a clear link between innovation and production.

#### **V. The Essential Role of Property Rights**

The iron triangle of economic development consists of liberalized and open trading systems, open and competitive markets inside borders, and protection of property rights. Protection of property rights constitutes the foundation of the other two principles of trade liberalization and competitive markets. Without property rights protection, the other two principles cannot be effective since firms compete with each other based on their property rights. Property rights protection is therefore a vital prerequisite to these other principles. Thus competition between different firms and platforms, properly protected by property rights, leads to consumer welfare enhancement and optimization. The foundational core of this belief comes from John Locke's Second Treatise on Government (1689), where he states:

“[e]very man has a property in his own person. This nobody has a right to but himself. The labor of his body, and the works of his hands, we may say are properly his. Whatsoever then he removes out of the realm of nature and mixes his labor with makes it his property. ...the major

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<sup>1</sup> Treaty on the Spitsbergen Archipelago, Feb. 9, 1920, 43 Stat. 1892, 2 L.N.T.S. 7. See in particular “acquired rights & nationals” in Articles 2 & 6.

purpose of man's putting himself under government was for the preservation of property.<sup>2</sup>

Blackstone's Legal Commentaries took the position that property rights were so important to the rule of law that "it will not authorize the least violation of it."<sup>3</sup> Arthur Lee, one of the founding fathers of the United States, said that the right to property was "the guardian of every other right, and to deprive people of this, is in fact to deprive them of their liberty."<sup>4</sup>

Madison also wrote:

"That is not a just government, nor is property secure under it, where arbitrary restrictions, exemptions, and monopolies deny to part of its citizens that free use of their faculties, and free choice of their occupations, which not only constitute their property in the general sense of the word; but are the means of acquiring property strictly so called. What must be the spirit of legislation where a manufacturer of linen cloth is forbidden to bury his own child in a linen shroud, in order to favour his neighbour who manufactures woolen cloth; where the manufacturer and wearer of woolen cloth are again forbidden the economical use of buttons of that material, in favor of the manufacturer of buttons of other materials!"<sup>5</sup>

Madison was writing specifically of the kinds of anti-competitive market distortions that erode property rights, and the ability of property owners to properly compete.

## **VI. What is Intellectual Property?**

Intellectual property is a sub species of property rights protection. Intellectual property rights are best understood by reference to property rights arising from the enclosure movement, as well as property rights arising from mining rights. However, there are some key differences, which include the fact that intellectual property rights have a public goods characteristic, attached to them. However, in many ways this makes the property even more worthy of protection than other types of physical property. The property needs protection because once it has been appropriated, it ceases to exist -- once the IP has been violated, it is gone -- whereas in the case of physical property, it can be returned to the true owner. Intellectual property can also have multiple owners, through licensing and cross-licensing arrangements, without eroding its value, as long as these arrangements are controlled by the owner of the property right.

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<sup>2</sup> John Locke, *Two Treatises of Government* (1689), Second Treatise, Chapter IX, Section 123-126, quoted in Shanker Singham, *A General Theory of Trade and Competition: Trade Liberalization and Competitive Markets* 223-24 (CMP Publishing, 2007).

<sup>3</sup> William Blackstone, *Commentaries* at 135, quoted in Singham, *supra* note 2, at 224.

<sup>4</sup> Quoted in Singham, *supra* note 2, at 224.

<sup>5</sup> **James Madison, Property**, 29 Mar. 1792 *Papers* 14:266--68

The protection of intellectual property has a long and classic historical pedigree. From Aristotle's writings in *The Politics*<sup>6</sup> to protection for glass making in Venice in the 13th century through the use of the word "right" in this context in the US Constitution, mankind has recognized the centrality of the link between liberty and intellectual property protection. Indeed, Article I, section 8 of the US Constitution is the only time the word "right" appears in that document. It states:

"to promote the progress of Science and useful Arts, by securing for limited Times to authors and inventors the exclusive right to their respective writings and discoveries."

While intellectual property does grant a temporary, exclusive right to certain inventions, that does not automatically translate to a temporary monopoly over a particular relevant market in a competition sense. This is more like a temporary property right than a monopoly in a competition sense. Indeed, the IPR only confers such a temporary monopoly right when monopoly in a competition sense is actually granted. This includes when a patent actually grants exclusive rights to a drug which is the only possible treatment for one particular disease. In practice this type of situation is comparatively rare. Much more common is the situation where the patent confers a property right on a given firm that can then compete against many other firms. (For example, a patent on a particular type of can opener almost certainly does not confer market power on the owner, because there are many types of can openers that compete vigorously in the marketplace.) It is this competition that the patent right helps to stimulate. In this case there is no monopoly conferred. The application of competition law must adequately distinguish between cases of actual monopoly and cases where there is no monopoly power and treat both very differently.

Even in cases where there is a temporary monopoly, it should be noted that there is nothing wrong with a monopoly from a competition standpoint, only with its abuse. Just as in other cases, market power alone should not trigger a different regulatory approach. This is very important in the innovation arena, as this is precisely where innovative firms differ from more traditional firms. All firms strive for the benefits of a monopoly or high levels of market share -- that is of course inherent in the process of business competition on the merits.

Innovative firms in particular typically set a higher premium on the need to acquire monopoly or market power in the process of competition. That is because such firms' start-up R&D costs are high but their marginal costs are close to zero, giving them a huge impetus to build high levels of market share as quickly as possible. A good example of this is software companies in the new media environment. These companies feel an economic driver to build as large an installed base as quickly as possible, as their marginal costs are declining to zero.

Landes and Posner have noted that the notion of monopoly and the notion of an exclusive property right are very different, specifically stating:

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<sup>6</sup> See, e.g., Aristotle, *The Politics*, Book II 72 (C. Lord Translation., University of Chicago Press, 1984).

“At one level it is a confusion of a property right with a monopoly. One does not say that the owner of a parcel of land has a monopoly because he has the right to exclude others from using the land. But a patent or a copyright is a monopoly in the same sense. It excludes other people from using some piece of intellectual property without consent. That in itself has no antitrust significance...Talk of patent and copyright “monopolies” is conventional...The usage is harmless as long as it is understood to be different from how the word is used in antitrust analysis.<sup>7</sup>”

Landes and Posner were looking at the US legal environment, and not at the developing international one. In the US the difference they cite to is relatively well understood. However, the confusion to which they refer is far from harmless in many international jurisdictions, and is arguably much less harmless in the US now than when they were writing. The problem is that if this confusion arises, then its impact can be very damaging, because it will lead necessarily to taking private property away from a property owner. This fear of having one’s property removed is a significant disincentive to using that property in any way, and will limit business activity in general and innovation specifically.

This erosion of protection also has an impact on international trade flows. In particular, exporters into a market where their intellectual property rights are not properly protected will lower their overall export levels into that market. Simultaneously, if IP violations lead to the artificial reduction of the costs of certain domestic firms, who do not have to pay for IP because of the violation, then these firms may be able to price at levels lower than those that an ordinary functioning market would dictate. The result of this is that these firms are able to gain larger market shares in other country markets than they would be able to in a normal market situation. These cost reductions are all too real. In 2006, the Business Software Alliance estimated that 90% of all software in Chinese computers (public or private) was pirated. Since software is used in factories to produce any product, those products are produced at a substantially lower cost than if intellectual property rights were actually protected.

For these reasons, trade agreements have long sought to ensure strong intellectual property protection, dating back to initial (albeit unfruitful) discussions regarding the possible creation of an International Trade Organization in 1947, and culminating in the GATT Uruguay Round’s TRIPS Agreement, which required signatory states to recognize and enforce Intellectual property rights. This dates back to the early years of the International Trade Organization discussions in 1947, which ultimately resulted only in the temporary tariff

## **VII. Different Types of Intellectual Property**

### **1. The Purpose of Copyright**

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<sup>7</sup> See Landes and Posner, *The Economic Structure of Intellectual Property Law* 374 (The Belknap Press of Harvard University Press, 2003), quoted in Singham, *supra* note 2, at 269.

Copyright aims to protect the expression of ideas. Historically, where the cost of copying has been high, and the time lag between production and copy was significant, a certain level of protection was accorded to authors and producers. Now, the dynamics are changing, and the costs of copying have been significantly reduced. It is generally understood that copyright protects the expression of ideas and not the underlying ideas themselves.

The difficult area is where the expression and idea cannot readily be separated, because to copyright the expression leads to a situation, where there are no other ways of expressing the same idea. However, even for cases where a particular expression of an idea would appear to convey the idea itself, it is rare to find an example where there are no alternatives to expressing the idea. For example, the first inventor of a clock might seek to copyright the traditional clock-face method of telling the time. But there are other ways of representing the time. An overly broad application of copyright could limit innovation, and act as a barrier to trade in itself.

## **2. The Function of Trademarks**

Trademarks are a shorthand way of identifying a particular brand that has an association in the mind of a consumer. As such, they play a vital role in the economics of buying and selling. Unlike copyrights, and especially unlike patents, trademark theory falls more within the legal area of unfair competition, and less within the realm of property law. This is important, as trademarks lose their value if they become generic. Trademarks have a variable value, which is entirely dependent on what the consumer thinks of them, and the association that he or she draws when faced with them. Trademarks do have some aspects of property rights, however. These include the fact that they may be bought and sold, that there is a system of registration of these rights so that they can be protected, and so forth.

Trademarks can be diluted or tarnished depending on how they are used. In this way they are likely pure property rights. Non-owners may not appropriate the trademark for their own use in the traditional sense. In other words, they may not try and use the trademark to deceive or confuse consumers, but they are also prevented from appropriating the mark where to do so causes no consumer confusion, but merely leads to the dilution of its value. This occurs when another party with no intent to deceive appropriates some of the investment that has gone into the use of the mark. For instance, where a company has spent vast resources on developing a mark that connotes luxury and quality, someone else should not be able to use that mark, even if it is applied to products that are clearly outside the trademark's industry.

Trademarks are a crucial aspect of ensuring strong inter-brand competition. But this protection must be secured without taking too many words out of regular usage. Thus general expressions cannot be trade marked. The registration process of the trademark system lends itself to potential rent-seeking activity. Therefore, the TRIPS

agreement provided that certain well-known marks could not be registered without proof of use, and first-to-use systems (as opposed to first-to-file) were preferred.

### 3. The Role of Patent Protection

Patent protection deserves a separate mention, as it operates in a slightly different way economically from copyrights and trademarks. One of the most significant differences is how the patent system contributes to increasing the stock of knowledge by requiring the inventor, in order to obtain a patent, to disclose the invention, thus increasing the stock of knowledge in the public domain. But just as with copyright laws, fundamental ideas are not patentable. The idea of the patent system is to incentivize the process of applying knowledge, not the process of knowledge accumulation per se. The patent law is intended to protect the fruits of man's labor, as is the case for property.

While the other areas of intellectual property protection, such as copyright and trademarks, are very important, patent protection presents special issues, as it is most like the mining rights discussed earlier in this paper. A very good example of some of the problems that patents create arises in the bio-pharma sector.

Patent protection generally is a given for products which by dint of being novel, involving an inventive step that is not obvious to one skilled in the art, and being capable of industrial application, are very expensive to produce. These products typically require substantial sunk costs of invention. In the case of the bio pharma industry, this is typically \$1bn for new drug development. Only one in four thousand compounds discovered in the laboratory is ever marketed, and only five in four thousand even make it to the stage where they can be given trials.<sup>8</sup>

The role of patents is summarized in A General Theory of Trade and Competition, when the author notes

Patents also increase the efficiency with which investment in innovation can be managed. The patent owner is incentivized to coordinate the search for technological and market enhancement of the patent's value which allows information to be exchanged among searchers and ensures that duplicative investments are not made. It facilitates the channeling of development into the most efficient invention for achieving the goal... These efficiency-creating, output-expanding aspects of the patent system counteract part or all of the output restricting consequences of creating an exclusive property right. The patent owner also has an incentive to make investments to maximize the value of the patent.<sup>9</sup>

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<sup>8</sup> Alan M. Fisch, *Compulsory Licensing of Pharmaceutical Patents: An Unreasonable Solution to an Unfortunate Problem*, 34 *Jurimetrics J.* 295, 302-03 (1994).

<sup>9</sup> Singham, *supra* note 2, at 283.

Hence, the patent improves the overall speed at which innovative applications can translate into inventions capable of industrial application.

#### **4. Case Study: Patent Rights and Pharmaceuticals**

One way to understand the patent system is through an analogy to the mineral rights claims of the 19<sup>th</sup> century American West. During this period, the U.S. government had two competing objectives: to retain government ownership of public land, and to make it possible for private firms to find and extract minerals contained in that land. In the mineral claim system, priority was given to those who were first to discover, stake and file a claim. The claimant had the exclusive right to mine a particular piece of land. As in the patent system, the mineral claim system required claimants to strictly limit their claims, both in what they sought and how the claim related to property that was outside the public domain. One of the functions of the mineral claim system was to create incentives for the prospectors to search for minerals. If the risk in research and development is high, then the reward for discovery must compensate for the high level of risk. In the mineral case, it is easy to see the potential for output-increasing effects. It is the same with the patent system.

A patent increases the efficiency with which investment in innovation can be managed. The patent owner is incentivized to coordinate the search for technological and market enhancement of the patent's value. This allows information to be exchanged among searchers and ensures that duplicative investments are not made. It facilitates the channeling of development into the most efficient invention for achieving a goal. These efficiency-creating, output expanding aspects of the patent system counteract part or all of the output-restricting consequences of creating an exclusive property right. The patent owner also has an incentive to make investments to maximize the value of the patent, without fear that this effort will lead to unpatentable information, which may be directly appropriated by competitors. Incentivization is needed to achieve a more efficient allocation of incentives. Strong patent rights reduce the risk to investors to create new projects.

A lack of patent protection leads to sub-optimal behavior. Another effect of the patent right is its promotion of innovation, both within the same field, because advances from innovation can be extended, and to other areas in which innovators can apply for patents of their own, thereby "inventing around" the patent. Moreover, because of patent rights, inventors have an incentive to disclose knowledge to the public that they might otherwise try to keep secret. This dissemination of information has the effect of accelerating the research and development of others. As information from patents is disclosed in patent applications, information about new technologies becomes more readily available to other inventors as an input into their own research and development.

One can increase the efficiency of the production of new drugs through a patent system, because a patent right allows for contracting between two firms. The innovative firm can sub-contract parts of the development and manufacturing work to other firms at a lower cost if its right to its innovation is protected. As one study proves, the movement

of knowledge through the contracting for the transfer of information associated with innovations plays an important role for developing country firms. Moreover, the opportunity to compete in the market with a strong patent regime remains. Just because one company has produced a cancer fighting medication does not mean that other companies cannot create better cancer fighting medications. Simply put, therapeutic alternatives create pressure to keep the price of patented drugs down. The year after Recombinate was released to treat hemophilia, Kogenate was introduced onto the market to treat the same symptoms. Similarly, in the case of Invirase, a protease inhibitor for AIDS/HIV, Norvir was introduced just three months later.

The possibility that patent holders would use their exclusive right to engage in monopolistic practices is limited, because the patent holder does not in fact possess power over price. One writer points to the fact that statistical studies prove that in the overwhelming number of patents, there is very little monopoly power. Competition laws that prevent anticompetitive practices from affecting markets beyond the legally recognized scope of the patent right also serve to keep any monopolistic impulse by patent holders in check.

## **5. Patent as Property Right**

The patent system is designed to strike a balance between granting a complete and absolute monopoly to an inventor for a particular innovation, and giving the inventor exclusive rights for so short a period of time that they could not possibly recoup their initial investment, thus serving as a disincentive for invention. It is important to point out that from an economics perspective it is difficult, if not impossible, to make a judgment as to where the balance is properly drawn. It is true that it is possible for patent protection to overcompensate inventors. The size of the monopoly profit has more to do with elasticity of demand and marginal cost of production than it does with amounts invested in research and development. However, patenting remains the best method that we currently know of for incentivizing research and development. The benefit of the exclusive right is that it allows a limited free market to operate for the licensing of the right, and it avoids having a government institution or a court decide what the royalty rate should be; thereby creating this “second best” solution.

It is important to draw a distinction between the monopoly right in the product, which is itself the subject of the patent right, and a monopoly in the treatment of a particular disease, in the case of pharmaceutical product patents. In the case of patent protection for a particular pharmaceutical product, there is no monopoly conferred for the treatment which that drug is intended to provide, as a substitute could be found which does not operate in the same way that the patented product operates in treating the same disease.

## **6. A Patent is not a Monopoly Right**

Whether the patent is regarded as a monopoly right or a property right will determine its role in the context of competition policy. It is a fundamental question, and one that too often has been glossed over. It is fundamental in the sense that the global economic architecture referred to and relied on in this paper depends on the proper protection of property rights. In order to answer this question from a competition policy standpoint, the starting point is to determine the size of the relevant product and geographic market. Patents protect particular drugs or processes, not the treatment in itself. Thus, if the relevant market is the treatment of a disease, then the patent does not necessarily confer power over price. The price of the drug may be lowered by other therapeutic substitutes. For example, Zantac and Tagamet are both patented pharmaceuticals that can be substituted for each other for the treatment of ulcers. Thanks to substitutes, the price of ulcer medication is lower than it would be if there was only one such drug for ulcers. Only in cases where there are no substitutes can potential power over price be found. Even so, the calculation is identical to the first fact pattern. In neither case does the monopoly itself give the patentee power over price.

A further question needs to be answered in antitrust analysis. We assume the smallest possible market – that of only one patented drug – and ask if consumers would shift to cheaper substitutes if the price of that drug increased. The answer is of course yes, as long as such substitutes exist. In other words, the relevant product market only will be the single patented drug where no other products are substitutable. So, the monopoly issue is only relevant when there is only one treatment for a particular disease. Indeed, not only are there different chemical entities which can treat a disease, these different chemical entities actually can be delivered by different brands, and the prescribing doctor has a choice of chemical entities and brands (such as in the case where there is a patented brand and a series of generics). The possible choices equal the number of chemical entities multiplied by the number of brands, which rapidly becomes a large array of possibilities.

Each of these permutations offers competition to the patented product, and the possibility of independently reducing its price through competition. To put it simply, the presence of other available or potentially available substitutes is a price discipline on the behavior of the patentee. The greater the cross-elasticity of demand, the greater the effect of price substitution. However, studies suggest that this is not a constant. In some cases, a smaller number of brands may sometimes lead to a smaller price increase in a post-patent world, where the cross-elasticity of substitution between chemical entities actually exceeds the overall cross-elasticity of demand. Hence, stronger therapeutic competition does not necessarily lessen the profit-maximizing potential of patentees. Frequently, as patent protection raises prices, as is so under more intense therapeutic competition, all of the competitors increase price too, weakening the disciplining effect of competition. The key criterion appears to be the number and weight of off-patent chemical entities. If this is high, then a high degree of therapeutic competition will lead to lower profits (and hence prices). But where elasticity is low, greater competition will have less of an effect on profits and price. In this context, it should be borne in mind that elasticity will increase the less developed a country actually is, and will be greatest in countries with the poorest people. It is also important to note that in antitrust, market power alone is not

enough to violate antitrust laws. It is only when a company with market power uses its power unreasonably with respect to its patent right that antitrust laws may be triggered, such as when a merger in a field risks harming competition from new providers of goods and services.

In their Antitrust Guidelines for the Licensing of Intellectual Property, the US federal antitrust agencies state that intellectual property does not necessarily create market power in the antitrust context. The guidelines make the point that although the patent right may confer the power to exclude with respect to a specific product or process, there will often be sufficient actual or potential close substitutes for such products, processes, or works to prevent the exercise of market power.

Defining the market is critical when evaluating whether patentees actually have market power in relevant antitrust markets, and not solely over a particular patented product. One of the most significant questions in determining the relevant market is, “What are the potential substitutes?” Traditionally, antitrust analysis has focused exclusively on product and geographic market definitions. One important aspect of the market is time, which is often considered in potential competition theory. Is there a separate technology or innovation market for certain pharmaceutical products? Potential competition theory has been recently “resurrected” to deal with the issue of technology. Broadly, potential competition theory was formerly used to challenge mergers or acquisitions where the acquirer might have entered the market independently, or the perceived new entry by the acquirer may have disciplined the behavior of those already in the market. The FTC began to rely on the doctrine once again in the early 1990s, after it had lain largely dormant during the Reagan era. Since then, the doctrine has shed its antique name, and re-emerged as the modern-sounding theory of “innovation markets”. It is likely that this theory has broader application where dynamic rather than static market concerns are pre-eminent.

Many of the cases in which the potential competition theory resurfaced were mergers involving pharmaceutical companies. For example, in Roche’s acquisition of Genentech, the FTC alleged that the acquisition would lessen competition in the research, development, production and marketing of three broad product areas (Vitamin C, Human Growth Hormone and treatments for HGH deficiency, and CD4-based AIDS/HIV therapeutics). The FTC order clearly evidences the FTC’s consideration of the effect on research and development spending in those distinct product markets if the merger were allowed to proceed. Thus, innovation market theory was developed. However, in a market where there are significant barriers to entry, the likelihood of potential competitors being foreclosed by exclusive agreements or by unilateral action by a monopolist is much less than in markets where barriers to entry are low. It, therefore, would be arguable that innovation market theory should be less important in the area of pharmaceutical innovation, because of the significant barriers to entry for new drug development.

## **7. Patents and Drug Prices**

Drug prices will not necessarily increase if countries shift to a patent enforcing system. While this might be true for a totally new product that is the only method for treating a particular disease, this is not true of patented products which compete with each other in the treatment of a disease. A number of critics of a strong patent regime argue that prices will increase if patent rights are recognized. This is not always the case. In Italy, for example, price increases were lower than the general increase in prices after the patent regime was strengthened. More generally, prices eventually go down after the patent expires. Numerous studies conclude that generic competition, after the expiration of a patent, brings prices of a drug close to its marginal production cost. Competition from other pharmaceutical companies forces the original holder of the patent to reduce price or accept a loss of market share. Another common argument is that the price of drugs will rise because of the displacement of copycat firms from the market because of patent protection. The displacement of copycat firms does not lead to a net social loss.

Patent skeptics sometimes cite the payment of royalties for patented products that copycat companies had previously utilized without such payment. Yet, a developing country that purchases technology is not disadvantaged by the purchase. Over the long term, it will result in gain due to that nation's incentive to build up its own imitative research and development capacity for when the drug patent expires. The payment for patented technology has an offset that can prove to be advantageous. Japan saw its high technology sector increase as the flow of new technologies stimulated domestic technological growth.

Moreover, the introduction of strong patent protection will not have a large effect on consumer welfare. If the new rate of product innovation is stable over time, the introduction of new patented drugs will be matched by those going off patent. The availability of other drug therapies that are off patent also reduces the price of drugs under a strong patent system, because firms will compete in price for sales, thereby reducing price to a level slightly above that of marginal cost.

Another reason that patent protection will not affect the welfare of most consumers is a sad but true fact. Many people are priced out of drugs once the price reaches a certain level. It does not matter if the cost of a drug is \$100 or \$180 a year if the average salary in a particular country is \$560 a year. Both drugs are equally unaffordable. Weak patent regimes, on the other hand, encourage anti-competitive and exclusionary behavior that permits the abuse of monopoly power in defending home markets or in penetrating foreign markets. This manifests itself in a number of different ways: export cartels, predatory dumping in the export of copied drugs, and collusive agreements among firms to divide markets in the internal sale and distribution of copied drugs. Such firms may behave in an oligopolistic manner, in which each copycat firm is assigned a particular part of the domestic market. The firms could then enforce their pricing scheme by the threat of predatory pricing to discipline a firm that exceeded its market share.

## **VIII. The Role of Government Distortions on Costs and Price**

Frequently, high prices for products are not brought about by the intellectual property right, but rather by other anti-competitive market distortions. One example of this is distribution restraints that make it very difficult to terminate a local distributor. This lessens competition in the distribution sector and leads to higher profit margins for distributors than would exist under ordinary conditions of competition. Distributors faced with much less competition in the distribution sector simply pass on higher costs to consumers.

These laws, known as dealer protection laws, are leftovers from days of import substitution and usually provide for very high termination indemnities, which must be paid by foreign suppliers upon terminating local distributors. Such indemnities do not arise for purely local relationships. Hence, these laws certainly violate GATS Article XVII and arguably GATT Article III.4. The result is that, for products that are distributed by foreign suppliers, distributors can, without fear of recourse, extract very high profit margins from local suppliers. In some cases, these margins can be as much as 80 per cent. Clearly this represents a substantial part, if not all, of the difference between foreign pharmaceutical prices for patented products and those of copycats in some markets.

Other government restraints such as price controls in the pharma sector impose distortions on the overall market, forcing firms to price at levels that require significant cross-subsidization, which in turn increases price in other markets.

## **IX. The Demise of Compulsory Licensing as an Antitrust Remedy**

Governments often cite a lack of competition as a reason to lower the overall price of products. Based on the discussion above, a fundamental lack of understanding of the purpose of intellectual property rights protection and the role that it plays in the economy translates into a misuse of the competition law to effect government mandated price reductions. The preferred way that governments do this is by using compulsory licensing of the patent right. Compulsory licensing emerged as a remedy for antitrust violations, and even in that context was less than ideal. Many commentators, including the US Supreme Court have expressed concern about compulsory licensing as a remedy. For example, Robert Sherwood has noted that

“A compulsory licensing system is a policy contradiction. In effect, the state, having bestowed an exclusive property right for an innovation in order to serve the public good, then exercises its discretion to reduce the value of that property right through compelled sharing of the property right...”<sup>10</sup>

The impact of the potential of a compulsory license on the patent system is immediate and severe. The threat of the license immediately destroys the prospect function of the intellectual property right, and makes it much less likely that firms will

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<sup>10</sup> Robert Sherwood, *Intellectual Property Systems and Investment Stimulation: The Rating of Systems in Eighteen Developing Countries*, 37 IDEA 261, 276-77 (1997).

engage in the kind of research and development spending necessary to develop innovation enhancing technologies.

Proponents of strong compulsory licensing statutes argue that such statutes are a solution to the problem of patent exclusivity because they are a remedy that is sometimes used in patent cases under U.S. law. In order for compulsory licensing to be a remedy, there must be some right that is violated; it is in antitrust cases that these remedies are most often fashioned. The basis of antitrust jurisprudence is to distinguish between lawful and unlawful acquisition and maintenance of monopoly power in order to promote greater competition, yield an efficient allocation of resources, and benefit consumers. When a patented product represents one of many products that compete in the market, few antitrust problems will arise. In the case where a patented product is so successful that it either evolves into its own market or engulfs a large percentage of the preexisting market, and the patentee takes actions aimed at excluding competition, there is potential for tension between antitrust and patent law.

However, the U.S. Supreme Court has found that, “Compulsory licensing is a rarity in our patent system...” The types of cases in which compulsory licenses have been granted are a small group in which the “intellectual property has been wrongfully acquired or pooled and cross-licensed with competitors and only if one of these acts is accompanied by other predatory conduct.” As a major treatise on antitrust notes, compulsory licensing may be used as a remedy for certain antitrust violations involving patents, but “it must be used sparingly.”

Even where there has been an antitrust violation, compulsory licensing is not favored as a remedy because any advantages are outweighed by administrative difficulties. The courts would have to supervise licensing arrangements and there is no way of determining what a “reasonable” royalty rate would be. The royalty rate will depend on the value of the patent, but value is almost impossible to determine until the product has been in the market for some time. In the US, compulsory licensing has not been adopted as a statutory requirement but is part of the relief which petitioners may receive if there has been a demonstrated patent misuse or antitrust violation. Nevertheless, in the U.S., there are very few cases where the use of compulsory licensing as a remedy resulted from the non-use of a patent. Importantly, compulsory licensing as a remedy for non-use is inapplicable to the pharmaceutical sector in which companies would want to bring new drugs to market to earn back the high cost of research and development.

## **1. Compulsory Licensing and the Patent Misuse Doctrine**

Arguments that support compulsory licensing are also sometimes based on some variant of the patent misuse doctrine. The U.S. Federal Circuit has construed the patent misuse precedent narrowly. As a general rule, the patent misuse doctrine has a broader scope than that of the antitrust laws, though there is a large amount of overlap between the two as long as antitrust concerns such as market structure, intent, and anti-competitive effect can be met. The patent misuse doctrine is a court made doctrine that is intended to

prevent a patent holder from extending the power of the patent beyond the grant defined by the patent statute. The doctrine is most frequently raised as a defense in infringement suits and breach of contract actions to pay royalties. If a patent holder is found guilty under the misuse doctrine, the patent is rendered unenforceable until the patent holder remedies the misuse. However, patent misuse may limit the validity of a patent for behavior that does not rise to the level of an antitrust violation. With the exception of non-economic reasons why the doctrine should apply, this represents a flaw in the doctrine itself.

The lack of enforceability of a patent has the same *de facto* effect as a compulsory license. The patent misuse doctrine differs from antitrust violations. The U.S. Supreme Court has noted that a patentee's act may constitute patent misuse without rising to the level of an antitrust violation.

The patent misuse doctrine applies the "clean hands" equitable doctrine as a vehicle for enforcing good faith requirements. Unclean hands alone will not render a patent right unenforceable, as the unclean conduct must have a relation to the patent in question. Yet, the doctrine has been applied to cases in which the patent holder has attempted to "tie" the sale of goods not covered by the patent. The test the Federal Circuit uses in its patent misuse jurisprudence examines whether, "the patentee has impermissibly broadened the "physical or temporal scope" of the patent with anti-competitive effect." A patent holder's behavior can be a misuse on its face in the case of *per se* antitrust violations (limited categories of behavior that are judicially deemed to lack redeeming qualities) such as price fixing.

The case-specific "rule of reason" serves as the basis for judging the legality of a potential anti-competitive effect in non *per se* matters (the vast majority of cases). In *Mallinckrodt, Inc. v. Medipart*, the Federal Circuit held that, "where an anti-competitive effect is asserted, the rule of reason under 35 U.S.C.A. §154 is the basis of determining the legality of the provision." If under the rule of reason, there has been a violation, then the misuse doctrine will apply. The patent misuse doctrine seems ill-equipped as a remedy in the pharmaceutical setting. The patent right makes it possible for pharmaceutical firms to get out products, which they are incentivized to do. Others are equally incentivized to come up with therapeutic alternatives if a large market exists for the drug. If there were *per se* violations, then the patent misuse doctrine as well as antitrust legislation would apply. However, these types of *per se* violations are not common in the drug industry. The healthcare problem is primarily because of the weakness of patent protection that limits inter-brand competition and leads to less innovation.

## **2. Compulsory Licensing and WTO Cases**

In the *Canada* patent case, Canada, arguing against the principle that the limitations allowed under TRIPs Art 30 should be non-discriminatory, acknowledged that the non-discriminatory rule was to ensure that:

“[t]wo types of discrimination that had been practised against pharmaceuticals and certain other products – either a denial of patentability for such products, or, if patents were granted, automatic compulsory licences permitting others to manufacture such products for a fee.”<sup>11</sup>

Thus, even countries seeking to limit patent protection in WTO cases accepted the general principle that compulsory licensing laws that dealt only with pharmaceutical products are innately discriminatory against pharmaceutical products.

### **3. How Must a Patentee Treat Rivals?**

Compulsory licensing’s popularity has arisen largely because of the perception that it is a legitimate way of lowering price. Intellectually and philosophically, it comes from the same place as the view that property rights are granted by the state and therefore do not relate to the individual owner in the same binding sense. In order to examine this notion, it is necessary to look at what obligations a patentee has to deal with its rivals. In particular, does the public’s interest in cheaper medicines trump the rights of the property owner and confer on him the positive requirement to deal with others?

The patentee’s obligation with respect to how it treats rivals is a significant issue, and one that is becoming more serious for patentees every day. Many reports quoted elsewhere in this paper suggested that patentees might be deemed to have some kind of obligation to deal with others. The apparent basis for this suggestion is public concern with the monopoly nature of the patent right. There appears to be a view that, since the patent confers a monopoly on the patentee, then one has to be very concerned about the behavior of the monopolist. Furthermore, on occasion, it may be appropriate to use government intervention to force a monopolist to license his products. However, this characterization is deeply misleading. First, patentees are not necessarily monopolists. Whether they are or not depends on the range of substitutable products available to treat a particular disease. Secondly, even if the patentee is a monopolist, forcing the patentee to license his product may not necessarily lead to positive results for consumers due to reasons detailed below. However, requiring a firm with market power to deal with rivals could have significant deterrent effects on innovation, and could lead to a decline in overall research and development spent by innovators. Some have also sought to use the patent misuse doctrine to discipline the patentee’s decisions to license or not license his patented product.

The U.S. experience is instructive here also. In the U.S., refusal to license is not a basis for the patent misuse doctrine. According to the Xerox litigation, it will not be grounds for any kind of antitrust violation if the patentee is merely exercising his right under the patent. More generally, in the 2004 *Verizon v. Trinko* case, the U.S. Supreme Court made it clear that even monopolists generally do not have a duty to deal with rivals. Highlighting the significance of this holding, the U.S. federal antitrust agencies, in their 2007 report on intellectual property and antitrust, affirmed that, “[a]lthough this right to

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<sup>11</sup> Panel Report, *Canada – Patent Protection of Pharmaceutical Products*, ¶ 7.90, WT/DS114/R (Mar. 20, 2000).

refuse to deal is not unqualified, the Supreme Court stated in *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP* that it has “been very cautious in recognizing such exceptions, because of the uncertain virtue of forced sharing and the difficulty of identifying and remedying anticompetitive conduct by a single firm.”<sup>12</sup> The 2007 report explained that this caution reflected the disincentive effects on innovation from forced sharing. Assessing relevant case law and economic policy considerations, the U.S. agencies “conclude[d] that liability for mere unconditional, unilateral refusals to license will not play a meaningful part in the interface between patent rights and antitrust protections.”<sup>13</sup>

#### **4. Compulsory Licensing as a Remedy for Refusals to Deal**

Compulsory licensing has had a changing fortune in U.S. litigation, principally as a remedy for antitrust violations, such as a merger that would have created monopoly power absent the license. However, recent U.S. learning in this area is very important. The increasing protection of patent rights in the U.S. in recent history has done much to boost innovation, and provides a model for other countries intent on building economic growth.

The compulsory licensing doctrine has not been significantly relied upon in the U.S. It has only substantively been applied where intellectual property has been wrongfully acquired or pooled and cross-licensed with competitors, and only if one of these acts is accompanied by some predatory conduct. The use has been more typically limited to consent decrees in merger cases. There is now a rebuttable presumption that a monopolist’s desire to exclude others from its protected work is a preemptively valid legal business justification for any immediate harm to consumers. Originally a copyright test, this has now been extended to patents also. In the *Image Technical* case, the court held this presumption could be rebutted by evidence of pretext. The Xerox litigation makes it clear that the courts will not inquire into the subjective motivation for exercising statutory rights granted under the patents laws, “even though [the] refusal to sell or license [a] patented invention may have anti-competitive effect, so long as the anti-competitive effect is not illegally extended beyond the statutory patent grant.”

#### **5. The Effect of Compulsory Licensing on Pharmaceutical Companies**

Compulsory licensing could have dramatic effects on pharmaceutical companies. The compulsory license will lead to a reduction of price for patented products. That loss will have to be somehow absorbed by pharmaceutical companies. There are various possibilities, which will be discussed below.

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<sup>12</sup> U.S. Dep’t of Justice and U.S. Federal Trade Comm’n, “Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition,” at 27 (2004) (citation omitted), available at <http://www.ftc.gov/reports/innovation/P040101PromotingInnovationandCompetitionrpt0704.pdf>.

<sup>13</sup> *Id.* At 30.

First, raising revenue by increasing other products' price. This cannot occur where drugs are sold in a competitive environment and may be capped by countries which have price controls. In other words, prices of the non-compulsory licensed patented drugs would likely increase in more competitive non-price controlled markets, such as the U.S., which would be politically unpalatable.

Second, the reduction of expenditure. The major expense that pharmaceutical companies incur is the cost of research and development. Other expenses include advertising and returns on investment. If returns on investment are lowered, share price could decline, and might lead to further consolidation in the industry. Lowering advertising revenues would have little impact on the losses that would result from compulsory licensing. The most significant reductions would have to come from research and development budgets. Companies might elect to engage in lower risk activity, such as generic production. In any event, a lower research and development budget will lead to fewer new pharmaceutical products being developed.

Thirdly, reducing costs by merging with rivals. Pharmaceutical companies may be faced with no other alternative but to merge with rivals in order to reduce costs. The result of this could be overall reduction in innovation, as competition in innovation is reduced and the incentive to invest substantially in research and development declines.

## **X. Parallel Trading**

Another way that governments can vitiate the intellectual property right is to allow parallel trading of products. Parallel trading damages the intellectual property right by allowing competing products that violate that national intellectual right to compete with protected products. Parallel trading thus exposes the fact that there is no global patent protection available for products, and that intellectual property regimes are usually uniquely national in character (with the exception of the European Patent Office).

Parallel trading in the pharmaceutical setting occurs when a product in one market is exported to another country. Parallel traders seek to take advantage of the arbitrage possibilities available in the pricing of drugs due to different economic and regulatory practices between countries. The practice has attracted international attention because of the perception that use of parallel importation regimes results in cheaper drug prices in the developing world.

Although empirical evidence on the implications of parallel trading is scant, a number of theoretical works show the negative implications of a parallel trading system. Parallel trading undermines the patent right and therefore creates an economic loss to both innovators and consumers, thereby creating an anti-competitive practice. To extract the lowest possible price for pharmaceutical products, consumers need a strong competition policy that encourages trade liberalization, protection against monopolization power, and the encouragement of FDI, rather than a system of parallel trading. This strong competition policy will let the market improve the allocation of resources in the economy. It also will create proper regulatory supervision to prevent monopolization or

exploitation of market power, since businessmen have an incentive to pursue anti-competitive behavior. This will prevent any abuse of the patent right.

Advocates of parallel trading often claim that parallel trading is in reality no different than the doctrine of international exhaustion of rights. Exhaustion occurs when a patent holder, or other intellectual property rights holder, has sold a product and can thereafter not prevent its authorized entry into a different market. The patent holder cannot prohibit the subsequent resale of the product because their rights to a particular item have been exhausted by the act of selling it. Such a definition requires a particular geographic area. For example, once a product enters the U.S. market it is exhausted anywhere within the U.S. market. This is quite different from international exhaustion of rights, which is what parallel traders seek. Exploitation of the property rights creates incentives to innovate and develop new products. International exhaustion of rights disadvantages consumers by making patents less effective in protecting the consumer by maintain quality through safety or technical standards and identifying the origin of a product. It also would make it difficult for the patent holder to control the distribution chain and conditions under which products are sold.

In the absence of strong competition policy, an exhaustion doctrine and exclusive distributorship agreements would have a detrimental effect on welfare, since domestic brands may be part of a single *de facto* cartel that would conspire to keep prices high through exclusive distributor relationships – vertical arrangements between upstream and downstream sellers. This type of vertical restraint was deemed untenable in the U.S. 60 years ago. National exhaustion, on the other hand, is permissible since traders are given the right to move goods within a national border, in the case of the U.S., or regional borders, in the case of the E.U. The situation of international exhaustion where one country allows for parallel imports from another unrelated country does not fit within this national exhaustion policy. The only reason why the doctrine might have some vitality in Europe is because of the drive towards a single European market. It has no application in free trade areas or among countries where market conditions are significantly different. Moreover, in Europe, the doctrine of exhaustion of rights is a bifurcated one. Recognizing the drive to retain and develop Europe's single market, exhaustion of rights applies to trademarks in Europe, but outside of Europe the doctrine has no application. However, even in Europe there are significant problems with the application of the doctrine in the case of pharmaceutical products where price controls exist in some countries, but not in others, and where pricing is not set in a uniform manner.

Some who believe in parallel trading and an international exhaustion system argue that such a system favors trade, whereas systems that limit parallel trading reduce free trade and are thereby anti-competitive. This reveals certain confusion. Followed to its logical conclusion, it would eliminate all forms of intellectual property, because it fails to recognize that the intellectual property because it fails to recognize that the intellectual property right is not merely tolerated by competition law, but encouraged. In addition, it also fails to take into account that efficient pricing may depend on a certain level of international price discrimination as described above. This is because the world is not yet a single, uniform market and different prices have to be charged for different products. If

companies cannot rely on the integrity of their pricing structures (because parallel traders are arbitraging the price differences), this efficiency would be lost.

Further, the argument for parallel trading does not take into account the fact that patents restrict market forces for a period of time in order for the patent holder to recoup the cost of innovation. This is based upon the assumption that the dynamic effects of the patent right will produce greater societal economic welfare gains than would occur without the patent right. The exhaustion doctrine is not so much a question of free trade as much as it is one of which form of patent policy to pursue. As one scholar notes, there are two serious problems with the exhaustion as free trade argument rather than as one of patent policy. “First, the conditions surround parallel trade do not fit into the assumptions on which standard static trade models supporting the case for laissez-faire trade are built. Second, a static analysis with regard to IPRs ... would require the removal of all rights to intellectual property.”

The economic reality is that price discrimination in the setting of drug prices in different markets, through market segmentation, can have significant positive effects for both producers and consumers. Because of the possibility of arbitrage, parallel importation also has a disciplining effect on the ability of companies to offer discounts for drugs in poorer countries’ markets. Any discounted drug simply would be the subject of an arbitrage action by a parallel trader, which would treat the drug like a discounted foreign currency. This would lead to dampened innovation and a lower likelihood that companies will lower price in less developed nations’ markets.

Under Ramsey pricing, companies based pricing on how much a particular consumer will be willing to pay for a particular good, above the marginal cost of producing such a good, because of different price elasticities for pharmaceuticals. The ability to discriminate based on price is a common and economically justified practice. Examples include offering volume discounts or discounts to initial customers. As an illustration, price discrimination is permitted in the case of movie tickets, where matinees and evenings shows are priced differently, as are tickets for youth and senior citizens, or advanced purchased over the phone, or prices for a large group. Price discrimination has ill-effects when it is used to gain or enhance monopoly power. Without differentiation of markets, pharmaceutical companies will not be able to recoup the cost of innovation during the life of their patent right. Another significant problem with allowing parallel trading is that the arbitrage it offers is a significant incentive for traders to cartelise their operations, and even for patentees to collude on price. This erosion of the incentive to charge a national market-based price will ultimately lead to problems in efficient allocation of resources.

Under European law, in *Centrapharm v Winthrop*, a pharmaceutical company tried to prevent the sale in the Netherlands of a medicine it had previously marketed in England, by invoking its Dutch trademark rights but while simultaneously enjoying parallel trading rights in the United Kingdom. The court found that beyond the protection of the specific subject matter of the trademark, its exercise aimed at preventing parallel importation of genuine goods from other Member States, is breaching the

provisions of the EU Treaty regarding free movement of goods. The European Court of Justice (ECJ) confirmed the key role of consent to the exhaustion of rights. If the goods are placed on the market by the trademark holder itself, or with its consent, the exclusivity rights connected to the IPR are exhausted.

## **XI. A Strong Intellectual Property Regime Leads to Greater Prosperity**

Linkage between intellectual property protection to economic growth has been longstanding, at least in the developed world. Robert Solow's seminal work over 40 years ago on the relationship between technology to growth demonstrated that 87.5 per cent of the growth of American economic output between 1904 and 1949 was related to technological factors. Although less research exists in the impact of research and development in the developing world, Edwin Mansfield's work illustrates that the intellectual property protection afforded by a country directly relates to the amount of technical development and transfer into the developing country. This factor significantly influences the composition of Foreign Direct Investment (FDI). Countries with strong intellectual property protection tend to experience a continuing flow of new high technology firms entering the industrial base.

One World Bank study concludes that patent protection is an important ingredient in any package to support domestic research and development. The higher the intellectual property protection the greater amount of investment. This investment in technology has important secondary effects on the economy of a developing country. Because of the competition, older firms adapt to the new technology. As more FDI penetrates the economy, the benefits permeate to human capital investment since workers need to be trained in the new technologies. As the amount of high technology investment grows – on the development reaches a certain threshold level – remaining in the country to pursue high technology work, rather than moving to the United States or Europe, becomes an option for developing highly educated workers. Once there are more high skilled workers that remain in a developing country as a result of stronger intellectual property laws, private capital investment, such as venture capital, increases because of the increased investment opportunities. This in turn creates more employment opportunities as more technology businesses are developed, thereby creating a net social economic gain for the developing country.

Another area in which developing countries benefit from the impact of greater patent protection is FDI in technology. Significant FDI occurs in countries with stronger patent regimes since a legal regime protects intellectual property is one of the factors that foreign investors use in order to decide where to place their investments. FDI is an important way for knowledge to be diffused from one country to another as a multinational firm will externalize proprietary knowledge with its local partners. Even in the case of wholly owned subsidiaries of multinationals, knowledge is still transferred because local employees are hired by and receive training from the multinationals. The relationships of these subsidiaries also produce an externalization of knowledge with the local firms with which it has business relationships. Evidence shows that U.S. firms that

invest in foreign production in developing countries are more research and development intensive, than similar U.S. firms that invest in developed countries.

Surveys have found the strength of the intellectual property rights regime of a country to be of particular importance to firms making research and development decisions regarding investment in the manufacturing stage of development, and in licensing of technology to unrelated firms. It follows that the stronger the intellectual property regime, the stronger the patent protection will be (and the greater the FDI will be). This is particularly true in the case of the pharmaceutical industry sensitive to patent protection. In an examination of the Indian pharmaceutical market, Lanjouw argues that there may be economic reasons why an intellectual property regime matters in decisions regarding the location of a research and development facility in a country. This may have spillover effects of research and development into neighboring firms. Just as important, a country's level of intellectual property protection may be used as a signaling mechanism for investors indicating the general business climate in a particular country: where the stronger the intellectual property regime, the more favorable the general business climate. The effect of trade barriers on technology transfers is linked to FDI when based on the level of intellectual property rights.

Increased patent rights stimulate investors and businesses inside and outside of a country to undertake activity beneficial to the country. Because patents protect innovation, even smaller developing countries can benefit from a strong patent regime since such a regime will help to establish a pro-invention culture in the domestic industry of such a country. A study of developing countries on the higher end of development spectrum, such as the Philippines, Argentina and Turkey, suggests that such countries must protect intellectual property in order to encourage the rapid development of long-term innovative abilities. In the 13 years since the publication of the study, the countries in the surveyed group that have seen the greatest technological innovation are the very ones that created strong patent systems, for example Mexico and South Korea.

In contrast with a strong patent system, a weak patent system, or one that fails to protect patents at all, will have a chilling effect on local scientific and technological capabilities. Scientists and engineers may abandon their home countries in search of stronger intellectual property systems so as to pursue their innovations in more hospitable settings. There is no incentive to innovate in countries where innovators cannot protect their work product from copycats. Copycat companies keep these countries from developing a robust technology related sector in their country. One author notes that highly educated graduates in developing countries often do not have technologically sophisticated businesses, universities or other research institutes in which to continue innovative, high technology work that one can more easily find in the developed world. Establishing such institutions is costly. Perhaps a quicker means to establishing such institutions is to attract high technology firms to a developing country. Since the only way that a high technology company will share its technology with a developing country is if a strong intellectual property (and particularly patent) system is in place, this will affect the business decision to transfer technology to the return of technologically skilled nationals who have studied or worked abroad in the developed world. Information from

India suggest that despite the fact that about 2-3 per cent of the world total of scientific papers originate in India, the number of scientists engaged in industrial research there is low and did not increase between 1977 and 1982 – a period when industrial research was expanding globally.

Another benefit of heightened patent protection is the incentive it provides to public private partnerships in university-based research. Private companies tend only to invest the sums needed to spur research in universities when they can gain the exclusive rights to the research. The insight has been borne out in practice in the U.S. By 1992, some \$3-\$5 billion of U.S. GDP originated from university licensed products. Canada, Europe and Japan also have shown that a more robust patent system increases the number of technology transfers from universities to private companies that exploit the research to the benefit of national economies. In contrast, too often in developing countries, potentially useful research contributes only to the university library and not to the economy of the country. The key to facilitating this type of technology transfer is, again, a robust patent protection system.

## **XII. Creation of Venture Capital Opportunities**

Venture capital is an area that is encouraged by a strong patent regime. Venture capital is financing that comes from firms that invest in young and rapidly growing companies. Venture capitalism is particularly important as a source of funding for start-up companies. In the U.S., private equity funds, which include firms specializing in venture capital, have expanded from \$50 billion in 1980, to roughly \$200 billion in 1999. Private equity has also increased tremendously in Europe where the size of funds raised has increased by 40 per cent or more annually over the last few years. In the U.S., venture capital alone accounted for \$46.55 billion of private equity in 1999, up from \$3.94 billion in 1993.

In the developing world, the amount of venture capital available is smaller. In part, this is a result of a weak intellectual property system. A strong intellectual property system is crucial to the success of venture capital and encourages the creation of venture capital investment in fledgling technology industries. Venture capital fills a void that larger institutions cannot fill as it serves as an intermediary between investors searching for high returns and entrepreneurs seeking funding. Consequently, venture capitalists require a high return than other investments because of the more risky nature of the endeavor. Venture capitalists therefore structure their deals to minimize risk and maximize returns. Private funds only will seek out new technologies and innovations if the risk of that creation being copied is very low. Otherwise, the risk on a return will be too great to make the venture viable given that many enterprises can list their innovation as their only significant asset. If the innovation cannot be protected, there is little chance that a venture capital firm would incur the risk of investment since the collateral for the investment could be easily copied, and thereby rendered worthless. The theory is born out in figures from countries that have stronger intellectual property regimes. For example, there are roughly 5,500 venture companies in South Korea and 174 venture capital funds have invested capital of 1.18 trillion won (\$1.53 billion).

### **XIII. Conclusion**

Based on the foregoing, intellectual property has taken an even greater significance now than it had in the past, because of the increased volume of tradable goods whose value is dependent on intellectual property rights. The protection in IPRs is a vital way of ensuring a competitive market with consumer welfare enhancing outcomes.

Shanker Singham

Chairman, International Roundtable on Trade and Competition Policy

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