Ciprofloxacin and Compulsory Licensing of Pharmaceutical Patents

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Lauren Keller

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Abstract:

The recent threat of biological terrorism involving the Anthrax virus incited a debate about whether the United States government should use its powers under 28 USC §1498 to take a compulsory license on the drug ciprofloxacin in order to stockpile it. Negotiating a deal with Bayer allowed the United States to stockpile ciprofloxacin at a substantial discount while avoiding the negative consequences of issuing a compulsory license. Under 35 U.S.C. 1498, the United States government has the authority to issue a compulsory license; however, the government may not have the authority under the TRIPs agreement. In fact, under the interpretation of the TRIPs agreement that the United States has adopted in previous situations when other countries wanted to issue compulsory licenses on pharmaceuticals, the United States most likely would have violated TRIPs if it had issued a compulsory license for ciprofloxacin. Furthermore, the policy decision to have strong patent protection and to not have price controls on pharmaceuticals in the United States has led to the development of a very strong pharmaceutical industry that leads the world in the development of innovative drugs.

The recent threat of biological terrorism involving the Anthrax virus incited a debate about whether the United States government should use its powers under 28 USC §1498 to take a compulsory license on the drug ciprofloxacin in order to stockpile it. Those who were putting pressure on the United States Department of Health and Human Services to sign contracts with generic manufacturers to purchase ciprofloxacin in bulk claimed that this would enable the United States government to stockpile ciprofloxacin more quickly and more cheaply thus easing the public's fears about potential shortages. On the other hand, even if the United States did take a compulsory license it would have to pay damages that could have ended up costing the government more than the price they were able to get by negotiating with Bayer, and in taking a compulsory license

the United States would have effectively adopted a new policy with respect to drug patents.

Adopting a new policy with respect to drug patents would have considerable effects on both the pharmaceutical industry in the United States and on the foreign relations of the United States with developing countries such as South Africa that have been fighting the pro-patent policy of the United States and other developed countries with respect to drug companies for years. Furthermore, ciprofloxacin is not the only drug available to treat anthrax. The United States could stockpile other drugs such as doxycycline in addition to ciprofloxacin to provide extra security in case of an outbreak of anthrax. While ciprofloxacin does have a more immediate effect than doxycycline in the treatment of anthrax, widespread inappropriate use of ciprofloxacin could only make it less effective.

In the end, the United States came to an agreement with Bayer and opted not to take a compulsory license of the ciprofloxacin patent. Under the agreement with Bayer, the United States Department of Health and Human Services would pay 95 cents per tablet for a total initial order of 100 million tablets. This was even a further discount from the already discounted price of $1.77 given to the United States government. Bayer also agreed to rotate the government's inventory to assure that the government would always have a fresh supply. The agreement also provided for the option of a second order of 100 million tablets at 85 cents, and a third order at 75 cents, if it was determined that these orders were needed. [1] The wholesale price of Cipro is regularly $4.67 each, and the normal retail price is $5.32 each. [2]

[1] HHS Press Office, HHS, Bayer Agree to Cipro Purchase, http://www.cptech.org/ip/health/cl/cipro/dhhs 10242001.html.

[2] http://money.cnn.com/2001/10/16/news/generic_cipro/.

The first part of this paper looks at the statute that enables the United States government to take a compulsory license of a patent, 28 USC 1498. Part two examines the TRIPs agreement, and then part three evaluates the legality of issuing compulsory licenses under TRIPs. The fourth part of the paper considers reasons for granting patent monopolies and how compulsory licenses affect patent incentives. Finally part five compares pharmaceutical price regulations in different countries.

Part 1: Analysis under 28 USC §1498

28 USC §1498 gives the federal government the power to take a compulsory license to use or produce a patented invention. Actually the language of the statute merely gives the owner of "an invention described in and covered by a patent of the United States" a remedy "by action against the United States in the United States Court of Federal Claims for the recovery of his reasonable and entire compensation for such use and manufacture" whenever his invention "is used or manufactured by or for the United States without license of the owner thereof or lawful right to use or manufacture the same." Nevertheless by limiting the remedy to reasonable and entire compensation rather than an injunction, a remedy that a patent owner could get against a normal party in a suit under 35 USC 284, 28 USC §1498 effectively allows the government to take a compulsory license of a patent. [3]

From the beginning, the United States government avoided liability for using patented inventions by relying on sovereign immunity. The creation of the Court of Claims in 1854 provided a forum for suits against the United States government, and in 1887, the Tucker Act authorized the Court of Claims "to adjudicate almost any money claim against the United States other than those 'sounding in tort.' Because the Court of Claims expressly did not have jurisdiction over tort claims, '' the Court of Claims

[3] Lionel Marks Lavenue, Article, Patent Infringement Against the United States and Government Contractors Under 28 USC §1498 In the United States Court of Federal Claims, 2 J. Intell. Prop. L. 389.

traditionally had no jurisdiction over patent infringement claims against the United States.'' [4]

Before the enactment of a statutory right to sue the government for patent infringement, the courts created means for remedy, direct resolution by congressional reference and indirect judicial resolution by impliedin-fact contract, in an attempt to avoid inequities to patent holders. In 1910, Congress created the first statutory action against the United States for patent infringement primarily to resolve ''the incongruity whereby the government could engage in patent infringement without incurring liability to the patentee.'' Congress amended the 1910 act with the Naval Appropriations act in 1918 resulting in 25 USC §68, the precursor to 28 USC §1498. The 1918 amendment eliminated some of the defenses previously allowed under the 1910 act thus strengthening the protection given to the patent holder. The overhaul of 25 USC §68 in favor of the new statute 28 USC §1498 primarily had the effect of giving contractors better protection in infringement suits resulting from manufacturing patented items under government contracts. Congress wanted to ensure that in times of national emergency contractors would not refuse to produce necessary equipment for government use because of their fear of liability for patent infringement. [5]

The courts have held that 28 USC §1498 "is essentially an Act to authorize the eminent domain taking of a patent license, and to provide just compensation for the patentee.'' [6]Under a theory of eminent domain, the government must meet the requirements of public use and just

[4]Id.
[5]Id.
[6]Leesona Corp. v. United States, 599 F.2d 958, 964, 202 U.S.P.Q. (BNA) 424 (Ct. Cl.), cert. denied, 444 U.S. 991 (1979).

compensation to avoid violating the takings clause of the constitution. [7] In Brunswick Corp. v. U.S. the court said that government use of a patent under 28 USC 1498 wasn't ''in strictest sense'' a ''taking in violation of Fifth Amendment'' since 28 USC 1498 ''grants government absolute power to take a compulsory, nonexclusive license to a patented invention at will,'' and thus ''the government has a statutory right to use a patented device.'' [8] The government regularly uses its power under 28 USC 1498 and has taken compulsory licenses on everything from sunglasses[9] to camouflage screens. [10]

Part 27 of the Federal Acquisition Regulation (FAR), in the Code of Federal Regulations (CFR), lays out the considerations that any agency of the federal government must consider in government contracting related to intellectual property. Section 27 lists the following policies regarding patents

[7] Kurt E. Springman, Comment and Legislative Review, The Impact of Seminole on Intellectual Property Infringement by State Actors: The Interaction of Article I, Article III, the Eleventh Amendment, and the Fourteenth Amendment, 29 Ariz. St. L.J. 889.

[8] Brunswick Corp. v. U.S., 36 Fed. Cl. 204 (1996).

[9] Gargoyles Inc. v United States 37 Fed Cl 95 (1997), subsequent app 42 USPAQ 2d (1997, CA FC).

[10] See Brunswick, 36 Fed. Cl. 204 (1996).

(a) The Government encourages the maximum practical commercial use of inventions made while performing Government contracts.

(b) Generally, the Government will not refuse to award a contract on the grounds that the prospective contractor may infringe a patent.

(c) Generally, the Government encourages the use of inventions in performing contracts and, by appropriate contract clauses, authorizes and consents to such use, even though the inventions may be covered by U.S. patents and indemnification against infringement may be appropriate.

(d) Generally, the Government should be indemnified against infringement of U.S. patents resulting from performing contracts when the supplies or services acquired under the contracts normally are or have been sold or offered for sale by any supplier to the public in the commercial open market or are the same as such supplies or services with relatively minor modifications.

(e) The Government acquires supplies or services on a competitive basis in accordance with part 6, but it is important that the efforts directed toward full and open competition not improperly demand or use data relating to private developments.

(f) The Government honors the rights in data resulting from private developments and limits its demands for such rights to those essential for Government purposes.

(g) The Government honors rights in patents, data, and copyrights, and complies with the stipulations of law in using or acquiring such rights. [11]

Policies e, f, and g proscribe improper demand or use of data and direct the government to honor rights in data and in patents. Historically the government gave an overt preference to patentees when awarding contracts for procurement; however, after the enactment of 28 USC §1498, the comptroller general changed the policy to one favoring competition, awarding contracts to the lowest bidder rather than giving a preference to patentees. The courts have backed up this policy stating that the purpose of this statute was to remove impediments to the government's procurement of patented articles; in other words, Congress sought to permit resolution of patent disputes after the contract award.'' [12]

Under 28 USC §1498, the government must pay "reasonable and entire compensation" to a patentee when it takes a compulsory license on a patent. The majority of cases have held that the proper measure of damages in a patent infringement suit under 28 USC §1498 is to require the government to pay reasonable royalty for its license as well as damages for its delay in paying the royalty. [13] In Leesona Corp. v United States, the court denied the patentee compensation for loss of exclusivity of the patent reasoning that complete congruence between 28 USC §1498 and Title 35 USCS, which provides for recovery in cases of private patent infringement would have granted the plaintiff recovery in excess of just compensation required by Fifth Amendment, and in excess of reasonable and entire compensation contemplated by Congress with passage of 28 USC §1498. [14]

The court in some cases, however, has suggested that lost profits or other measures of damages may be used instead of reasonable royalty rate. In Decca Ltd. v United States, the court listed three possible measures of damages (1) determination of reasonable royalty for license, (2) awarding a percentage

[12] Lavenue, supra. Note 1.
[13] Standard Mfg. Co. v United States, 42 Fed Cl 748 (1999).
[14] Leesona Corp. v United States, 220 Ct Cl 234, cert den 444 US 991 (1979).

of governmental cost savings arising from governmental use of the patented invention, or (3) awarding lost profits. [15] Recently in Gargoyles, Inc. v United States, a case involving the a taking by the United States military of a compulsory license on the design of Gargoyles protective sunglasses with toric lenses and substantial wrap depth, the patentee argued that the trial court in calculating damages based on a reasonable royalty rate awarded it insufficient compensation. Citing Rite-Hite Corp. v Kelley Co. [16] the patentee claimed that it was entitled to lost profits since but for the infringement of the government, there was a reasonable probability that it would have made the sales in question. The court in Gargoyles, however, agreed with the government's argument that under Tektronix Inc. v. United States, [17] lost profits would be available only upon a showing of strictest proof, that the plaintiff would have actually earned and retained sums claimed on its sales to the government, and that but for the government's infringement, the plaintiff would have made the infringer's sales. [18]

Using a reasonable royalty as the measure of damages, the court still must decide the issue of how to determine the amount of a reasonable royalty. Generally the reasonable compensation will be based on a royalty that the parties would have agreed upon if both were reasonably trying to reach an agreement. [19] The Leesona court calculated a reasonable royalty based on the ''preferred method of determining just compensation for patent infringement under 28 USC §1498,'' the comparative royalty technique. Using the comparative royalty technique the court will compute the award by estimating a reasonable royalty on proper measures such as savings to government, lost profits,

[15] Decca Ltd. v United States, 225 Ct Cl 326, cert den 454 US 819 (1980).
[16] Rite-Hite Corp. v. Kelley Co., 56 F.3d 1538, 1545, 35 U.S.P.Q.2D (BNA) 1065, 1069 (Fed. Cir.) (in banc), cert. denied, 133 L. Ed. 2d 122, 116 S. Ct. 184 (1995).
[17] Tektronix Inc. v United States, 213 Ct Cl 257 (1977).
[18] See Gargoyles, 37 Fed Cl 95 (1997), subsequent app 42 USPAQ 2d (1997, CA FC).
[19] See Tektronix, 213 Ct Cl 257.

etc. [20] In Gargoyles, the court held that in determining a reasonable royalty a court should first look to see if there is an established royalty applicable to the patent at issue, and if there is then the court should usually use that rate. If there is no established royalty, the court should determine the rate through a process of constructing a hypothetical negotiation between a suppositious willing buyer and willing seller. [21]

Part 2: TRIPs and developing countries

The United States has always been one of the strongest supporters of strong intellectual property protection worldwide. The pharmaceutical industry, one of the strongest components of the American economy, has extensively lobbied the government to push for stronger patent rights, and the United States fought a hard battle using trade incentives to get many developing nations such as India, Thailand and South Africa to agree to the patent protections embodied in the TRIPs agreement. The TRIPs agreement, the World Trade Organization's (WTO) Agreement on Trade Related Aspects of Intellectual Property Rights, establishes minimum levels of intellectual property protection. In addition, the United States has used TRIPs to impose trade sanctions forcing other countries to abandon proposals to issue compulsory licenses to make drugs more affordable in emergency situations claiming that these proposals violate the TRIPs agreement.

Industries that require large investments for research and development such as pharmaceuticals and biological innovations contribute heavily to the economies of developed countries. By contrast, developing nations have very few companies doing large amounts of research and development or obtaining patents in these fields. In

[20] See Leesona, 220 Ct Cl 234.
[21] See Gargoyles, 37 Fed Cl 95.

addition, developing countries often feel that granting patent rights increases the price of pharmaceuticals above a price that their citizens can afford.

In India, generic drug companies thrive and contribute substantially to the economy. These generic drug manufacturers have a lot of wealth and influence the Indian government through lobbying just as pharmaceutical innovators do in the United States. India fought hard against adopting the TRIPs agreement; however, the United States and other developed countries convinced India to adopt TRIPs by using incentives, such as a lifting of textile tariffs, designed to bolster other segments of India's economy to compensate for the loss in the generic drug manufacturing sector that would result from the heightened patent protections. In addition, the developed countries agreed to provisions allowing developing countries to gradually change their patent laws to come into compliance with TRIPs rather than requiring immediate compliance further easing the immediate hardships that developing nations would face in complying with the treaty. Now that some of these deadlines are coming up, the United States has raised disputes with the WTO, the organization responsible for administering TRIPs, over the fact that India has not entirely come into compliance in the allowed time frames. [22]

While developing nations have been slow to agree to the minimum levels of intellectual property protection required by TRIPs because they feel that companies in their countries have little to gain from patent protection, they also have fought adoption of the TRIPs agreement on the grounds that it will increase the prices of drugs sold in their countries. Recently the South African Parliament and the United States Trade Representative disputed the proper interpretation of the TRIPs agreement on the issuance of compulsory licenses of pharmaceutical patents by governments in developing nations.

[22] George K. Foster, Opposing Forces in a Revolution in International Patent Protection: The U.S. and India in the Uruguay Round and its Aftermath, 3 UCLA J. International Law and Foreign Affairs 283 (1998).

The South African government felt that it needed to issue compulsory licenses on pharmaceuticals, particularly those used in the treatment of the AIDS virus, to make the drugs affordable for the large number of South African citizens infected with AIDS or other diseases. When South Africa recently introduced legislation to allow its Health Minister to issue compulsory licenses for pharmaceuticals, the United States interpreted those actions to violate intellectual property standards in TRIPs and threatened trade sanctions. In the end, the United States and South Africa settled the matter quietly without involving the WTO's dispute settlement body. [23]

If the United States government issued a compulsory license for ciprofloxacin to treat anthrax, it would have done in the shadow of having very recently threatened trade sanctions against South Africa to keep them from issuing compulsory licenses for the drugs used to treat AIDS, ''one of the greatest threats to the South African population, currently affecting one-eighth of its citizens.'' [24] By contrast with developed countries where AIDS patients receive an array of medicines to help delay the onset of symptoms, ''many physicians in South Africa do not mention those remedies to their patients because they know that the patients cannot afford the drugs.'' [25] Antiretrovirals, the most important pharmaceuticals for combating the AIDS virus, ''reduce the viral load in the bloodstream to nearly undetectable levels, reduce OIs, prolong life, and transform HIV/AIDS into a chronic infection requiring only outpatient care. Antiretrovirals have also been successful in reducing mother to child transmission of HIV infection by nearly seventy percent.'' Because ''most antiretroviral patents are still valid in the original country and generic versions are difficult to procure,'' manufacturers enjoy monopoly

[23] Sara M. Ford, Note and Comments: Compulsory Licensing Provisions Under the TRIPs Agreement: Balancing Pills and Patents, 15 Am. U. Int'l L. Rev. 941.
[24] Id.
[25] Id.

pricing. [26]

In 1997 the South African parliament responded to the AIDS crisis by proposing the Medicines and Related Substances Control Amendment Act. The parliament believed that by allowing the health minister to allow compulsory licensing and parallel importing it could lower the prices of pharmaceuticals and protect the health of the public. The United States opposed the issuance of compulsory licenses to combat South Africa's public health emergency citing many legitimate reasons including ''the promotion of scientific research and development industries in developing nations, the protection of the sick population from inappropriate administration of potent pharmaceuticals, the allegiance to international treaties enforcing the policy of intellectual property rights, and [the violation] of international intellectual property law proscribed in the TRIPs agreement [through the improper issuance of compulsory licenses].'' [27]

The United States cannot advocate these considerations against the taking of compulsory licenses when South Africa has a health emergency and wants to address the problem through issuing compulsory licenses on pharmaceuticals and then ignore these same considerations and issue compulsory licenses when it perceives a health emergency on its own soil. Even without the United States setting a separate standard for its own health emergencies it has already ''[attracted] unflattering claims that [it used] its economic power to bully'' South Africa a developing nation. [28]

Part 3: Legality Under TRIPs

The TRIPs agreement does provide some exceptions that allow countries to issue compulsory licenses. Gen-

[26]Rosalyn S. Park, Note: The International Drug Industry: What the Future Holds for South Africa's HIV/AIDS patients, 11 Minn. J. Global Trade 125.
[27]Ford, supra. Note 23.
[28]Id.

erally these exceptions were intended to allow developing countries to obtain drugs at cheaper prices, and in the past the United States has fought for a very narrow interpretation of these provisions to prevent countries from issuing compulsory licenses. The conflict has centered on whether these exceptions, particularly Article 31 should be interpreted narrowly, limiting the use of compulsory licenses, as developed countries would prefer or more broadly as advocated by developing countries. The issue of compulsory licenses still has never been brought before the WTO's dispute settlement board, the body with authority to interpret the TRIPs agreement. [29]

One exception provided by the TRIPs agreement involves parallel importation or exhaustion, permitting a party to buy a drug in one country and re-sell it in another country at a lower price than the price at which the patentee sells the drug in the second country. According to Article 6 of the TRIPs agreement ''for the purposes of dispute settlement under this agreement, subject to Articles 3 and 4 above, nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights. Thus under international law, once a patented item has been sold anywhere in the world the rights of that reproduction are exhausted. [30]

Pharmaceutical companies price drugs at different levels in different countries. This enables patent holders to maximize profits by customizing their monopolistic pricing strategies to the elasticity of demand in each individual market. Consumers in poorer countries cannot afford to pay the prices charged for drugs in developed countries so the price that a company should charge to maximize its profits in a poorer country will be much lower than its profit maximizing price in a developed country. The problem is that drug companies price their drugs with the realization that exhaustion occurs and thus pharmaceuticals sold in one country will be imported

[29] Id.
[30] Park, supra. Note 26.

to another country where the patentee charges higher prices. This prevents pharmaceutical companies from charging as low a price in the developing countries as they would otherwise. If exhaustion did not occur, patent holding drug companies would capture the highest possible value in each separate market by pricing drugs at rates that people can afford discounting the price to account for lower incomes in developing nations thereby maximizing their profits.

Currently most courts interpret the law in the United States as allowing a patentee to prevent parallel importation, but laws in many other countries do not. In the United States, the patent owner has the right to exclude others from making, using, offering for sale, selling, or importing the patented product. Complications, however, arise because of the first sale doctrine. According to the first sale doctrine a patent holder exhausts his rights in a good when he transfers ownership of that good. The first sale doctrine can have a territorial or a global interpretation, and "in general courts continue to uphold the territorial nature of the patent against claims of universal exhaustion. In some lower court cases, however, judges have proved susceptible to arguments that allege that patent holders, through restricting parallel imports, are receiving double profits out of proportion to their contribution to the economic welfare of the country." [31]

Most commentators cite Boesch v. Graff [32] for the assertion that the first sale doctrine is territorial. In Boesch, a third party that held a parallel German patent manufactured lamp burners in Germany that infringed a United States patent. A buyer of the lamp burners in Germany then imported the lamp burners to the United States. The court held that this importation violated the patent holder's rights in the United States in spite of the first sale doctrine.

[31] Claude E. Barfield and Mark A. Groombridge, Article: Parallel Trade in the Pharmaceutical Industry: Implications for Innovation, Consumer Welfare, and Health Policy, 10 Fordham Intell. Prop. Media & Ent. L.J. 185.

[32] Boesch v. Graff, 133 U.S. 697 (1890).

In this case, however, the lamp burners were sold in Germany without the United State's patent holder's consent so it remains unclear how much this decision depends on the facts of the case and whether the territoriality of the first sale doctrine would apply in a case where the item was sold abroad by the holder of the United States patent.

Other United States statutes further back up the power of United States patent holders to block parallel imports. 35 USC §261 gives the patent owner the power to impose and enforce territorial restrictions in the United States on sales by distributors. In addition, for pharmaceuticals Congress in 1987 banned the reimportation of pharmaceutical products except by the original manufacturer justifying this measure by concerns for health and safety. [33]

In spite of all the laws enabling patent owners to prevent parallel importation, in October 2000, President Clinton signed into law an agricultural bill containing a provision authorizing the Secretary of Health and Human Services to promulgate regulations permitting pharmacists and wholesalers to reimport patented prescription drugs if the Secretary of Health and Human Services could show that the regulations would not pose any additional health risk to the public and would significantly reduce the cost of drugs. The Secretary of Health at the time, Donna Shelala, however, never implemented the regulation because of concerns for public health and doubt about the likelihood of substantial price reduction. Supporters of this legislation argued that Americans shouldn't have to pay higher prices for drugs than citizens of other developed nations. [34]

The European Union has two different policies regarding parallel imports, one for within the

[33] See Barfield, supra. Note 31.

[34] Id.

European Union and one for parallel imports from nations outside of the European Union. The European Court of Justice has handed down a series of decisions adopting a doctrine of ‘‘international exhaustion’’ within the European Union in furtherance of the goal of creating a common market and removing barriers to trade. On the other hand, the European Court of Justice has indicated that it will apply territorial exhaustion to parallel imports from nations outside of the European Union. [35]

The second exception under the TRIPs agreement that enables developing countries to obtain drugs at cheaper prices is the exception allowing for compulsory licensing. TRIPs allows ‘‘the use of compulsory licensing: (1) against any crises in public safety or health; and (2) to promote public interest in the areas of socio-economics and development.’’ [36] Article 8, which acts as a policy statement for Articles 30, 31, and 40, permits Member States to adopt legislative or regulatory measures ‘‘necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic ...development ...provided that such measures are consistent with the provisions of this Agreement.’’ [37]

Countries that want to grant compulsory licenses without violating the TRIPs agreement rely on Article 27 or Article 31. Similarly countries that argue that compulsory licenses violate the TRIPs agreement interpret Article 27 and Article 31 to have a narrow scope permitting compulsory licenses only under very specific conditions. Article 27 defines patentable subject matter and provides a list of exceptions that member countries may choose to exclude from patentability while Article 31 sets forth guidelines that member countries must follow when issuing a compulsory license.

[35] Id.
[36] Id.
[37] Id.

Article 27 allows countries to exclude inventions from patentable subject matter "when necessary to prevent abusive commercial exploitation of the invention and to protect ordre public, morality, and human life or health." To satisfy the ordre public exception, "the risk must arise from the invention's commercial exploitation rather than the invention itself." According to some trade experts "Article 27.1 allows patents to be enjoyed without discrimination and therefore, any program for compulsory licensing based on public health is discriminatory. However, most trade experts view this interpretation as absurd and cite the broad scope of TRIPs to permit compulsory licensing on nearly all public health grounds." [38]

Article 31 provides provisions regulating the issuance of compulsory licenses. Under Article 31, member countries may ''determine the basis for granting compulsory licenses,'' [39] but they must comply with a list of requirements before issuing any compulsory licenses. Article 31 contains the following provisions:

[38] Id.
[39] Id.

> "Section (a) notes that authorization of compulsory licensing should be considered on its merits. Section (b) conditions the granting of compulsory licenses on an initial attempt to obtain authorization by the patent holder through commercial terms and failure to obtain an agreement within a reasonable amount of time. Furthermore, this provision permits waivers in [circumstances] of national emergency or extreme urgency. Section (c) limits the use of the compulsory licensing scheme to the purpose for which it was initially authorized. Section (d) notes that the compulsory license will not be exclusive and Section (e) notes that it will not be assignable. Section (f) proscribes that use of the license shall be predominantly for domestic market use. Section (g) authorizes use of compulsory licenses only during the time that the circumstances for its creation still exist, and competent authority shall have the power to review the continuation of the compulsory licenses**.** Section (h) ascribes proper payment to the patent holder, based on the economic value of the compulsory licensing scheme. Section (i) notes that the decision to authorize compulsory licenses is subject to judicial review and Section (j) explains that the payment to the patent holder is also subject to judicial review by a distinct higher authority in that member. Finally, Section (k) comments that special consideration should be given in cases where the patent holder is engaged in anti-competitive acts." [40]

Essentially any compulsory license issued must be restricted to the purpose for which it was granted, must be non-exclusive, and must be non-assignable. In addition, a country may only grant a compulsory license if the user has made efforts to obtain authorization from the rights holder on reasonable commercial terms and conditions and such efforts have not been successful within a reasonable period of time. Furthermore the country must adequately remunerate the patentee. [41]

The provisions of Article 31 allow for substantially different possible interpretations. Article 31 attempts

[41] `Id.`

to provide a balance between the interests of public health and safety that incite governments to issue compulsory licenses and the interests of promoting research by granting rights to patent holders. Most of the debate involving compulsory licenses centers around the ambiguity in the terms "circumstances" in Sections (b) and (g) and "purpose" in Section (c) of Article 31. Article 31 does not specify what situations would qualify as a "case of national emergency or other circumstances of extreme urgency" that allow for a waiver of the requirement in section (b) that the proposed user make efforts to obtain authorization from the patent holder. Section (g) requires that the compulsory licensing end when the "circumstances" no longer exist. In section (c), the agreement limits the "scope and duration of such use" to "the purpose for which is was authorized," but fails to indicate how broadly or narrowly purpose should be defined. [42]

Under Articles 27 and 31, TRIPs permits compulsory licensing only under certain conditions in specific circumstances. The provisions require that compulsory licensing be "necessary to protect human life and health or to address a national emergency." Issuing a compulsory license of the ciprofloxacin patent in response to the recent anthrax scare very well may meet the standard of "necessary" as well as the standard of "health emergency." On the other hand, the case for the South African parliament's proposal to issue compulsory licenses of the pharmaceuticals used to treat HIV may present an even stronger case for meeting both the "necessary" and "health emergency" standards. The same arguments against compulsory licensing meeting the standard of Articles 27 and 31 apply to both situations. [43]

The standard under Article 27 is "necessary" suggesting that no alternatives exist. In the situation in South Africa, critics have argued that many alternatives to supplying antiretrovirals exist citing the importance of education, prevention, diagnosis, and counseling to combat the AIDS crisis. Furthermore antiretrovirals do not cure people dying of the AIDS virus but merely reduce the presence of the virus. [44]

[42] Id.
[43] Id.
[44] Id.

On the other hand, there is highly persuasive evidence that compulsory licensing is necessary to protect human life and health in South Africa. Despite the fact that South Africa has established follow up support and care procedures for HIV-positive patients as well as programs that educate and prevent the spread of HIV a staggering number of people in South Africa die premature deaths each year due to AIDS. Antiretroviral therapy would dramatically lower the morality rates. In addition, 13.2 million children are left orphaned each year due to AIDS, and "children orphaned by AIDS face a higher risk of malnutrition, illness, abuse, and sexual exploitation than other orphans." [45]

Compulsory licensing of ciprofloxacin by the United States to combat the recent anthrax scare could not any more clearly meet the "necessary" standard than the proposed compulsory licensing of pharmaceuticals used to combat AIDS in South Africa. First alternatives do exist. One alternative is treating people with doxycyclene rather than ciprofloxacin, and another alternative is reaching a negotiated agreement with Bayer, which the United States was able to accomplish. Second the possibility of an anthrax outbreak was merely a threat as opposed to an actual, documented outbreak of a disease effecting large portions of the population, which is the situation with the AIDS epidemic in South Africa. Now that time has passed since the original scare it has turned out that the United States has not needed to use the stockpile of ciprofloxacin that it has accumulated after all.

Certainly most Americans felt threatened by and fearful of the possibility of an Anthrax outbreak. Furthermore many would argue that public health and safety should come before the interests of pharmaceutical companies; however, patent based monopolies make research and development of new drugs a good investment for pharmaceutical companies. When developing countries like South Africa argue that public health should come before the interests of pharmaceutical companies, the United States argues that it is in the

[45] Id.

best interest of public health to provide incentives for the development of new drugs and thus developing countries should respect the rights of patentees. The United States cannot then just ignore this argument when the public health of its own citizens is at risk.

Part 4: Patent rights as incentive for research

The United States grants patent rights to inventors primarily for the purpose of stimulating technological innovation. Innovation, particularly in the pharmaceutical industry requires large investments in research and development, and innovators need to earn high profits from marketing their successful inventions so that they can attract investors willing to fund their research. Issuing compulsory licenses, one method of imposing price controls, reduces innovation particularly in the pharmaceutical industry with its particularly high research and development expenditures. Comparing the rate of innovation in the pharmaceutical industry in the United States with the rate of pharmaceutical innovation in other industrialized countries where price controls are imposed shows the stifling effect that price controls have on innovation.

Art. 1 section 8 of the United States Constitution gives Congress the power to grant monopolies for limited terms of years to inventors to promote science and the useful arts. The authors of the constitution justified allowing inventors to have monopolistic powers as a way of promoting investment in research thereby fostering technological innovation and its dissemination to the pubic. In this vein, the quid pro quo for inventors receiving the exclusive right to make, use, or sell an invention for a limited time, is that the inventor must meet disclosure requirements set out in the patent laws, Title 35 of the USC, so that the public can use the technology in the future. Granting compulsory licenses undermines the ability of our patent system to achieve the goal of creating an incentive for technological innovation.

The pharmaceutical industry particularly needs the incentive of patent monopolies to make the development

of new drugs possible because of the great expense and risk involved. The process of research, testing, and approval necessary in creating a new drug requires a large investment, and since "less than one in ten compounds approved recovers its cost," [46] the few drugs that do become a commercial success have to bring in enough profits for a company to make up for all the money spent on research and development of potential drugs that don't succeed. In addition, pharmaceutical companies cannot use trade secret protection, an alternative type of protection available for some other types of inventions, because the approval process requires subjects a new drug to intense scrutiny. Furthermore, it's important to have multiple people competing and developing different types of drugs to treat each disease since different people respond better to different drugs. If private investors did not fund the development of new drugs, the public would never have the benefit of many important drugs since the government could not afford to finance the huge expense necessary, on average $ 500 million and fourteen years, to develop and bring to market a new pharmaceutical. One example of this is penicillin, which was not produced for years after it was discovered because England at that time did not have a patent system. Compulsory licenses like other types of price controls suppress the development of innovative drugs.

Critics point to the pharmaceutical industry's annual reported profits, which on average rank high relative to other industries, as evidence that patent protection has allowed pharmaceutical companies to earn even more of a profit than necessary to encourage investment in the industry. This criticism, though, fails to account for the fact that pharmaceutical companies by comparison with companies in other industries dedicate higher portions of their profits to research and development for future innovations. In addition, the pharmaceutical industry differs from other large industries due to the high sunk costs involved in developing a new drug. Sunk costs incurred in preparing to bring a new drug to market include costs for efficacy studies, regulatory

[46] 16 Conn. J. Int'l L. 149, 153

review, and the time delays they impose. For the large part, these costs are unrecoverable. [47]

Because pharmaceutical companies have such large research and development costs standard accounting terminology creates a bias inflating the profits reported for this industry as compared with other industries that do not incorporate similarly high sunk costs. In most industries companies generate profits based largely on current research and development expenditures. Thus moderate annual expenditures offset the annual profits generated from those expenditures. For example, a cereal company can create a new cereal with a relatively small amount of sunk capital and can begin marketing the cereal within a short time period, a year or two. In the pharmaceuticals industry, by contrast, a company will invest large amounts in research and development, possibly incurring losses, in early years but will not see the profits from that expenditure until many years later due to the "large lag time for approval and large sunk costs for R&D." Thus in annual accounting research and development expenditures do not offset the profits derived from those expenditures because the expenditure gets reported in a different year than the eventual profit. [48]

A better measure to use in comparing profit levels among disparate industries is a measurement of their internal rate of return (IRR). Analyses that have been done using this measure have found that the pharmaceutical industry has an "IRR of [only] 11.1% against the industry's average real cost of capital of 10.5%. Thus the pharmaceutical industry's profitability is within 1% of its real cost of capital, clearly not an excessive level of profitability." [49]

It's no accident that "the American pharmaceutical industry is the undisputed world leader in developing new and effective treatments. From 1975 to 1989, American companies produced forty-seven significant new pharmaceutical compounds, as compared to fifty for the rest of the world. Between 1970 and 1992, American

[47] Id.
[48] Id.
[49] Id.

firms accounted for 42.8% of the world's breakthrough drugs, and American firms lead in all drug categories. During a similar period, Britain accounted for 14%, Germany 7%, and France 3%, and it is estimated that all European countries combined will produce only five new breakthrough drugs by the year 2002." The fact that most industrialized nations other than the United States have imposed restrictions on pharmaceutical pricing has clearly had an impact. [50]

Basic macro economic principles indicate that reduced profits will yield reduced innovation. Investors demand higher expected returns to compensate for higher variance in expected return when evaluating an investment. Risk has a price. When price controls reduce profits, this diminishes the expected return on an investment, and "the cost of capital will rise not only to reflect the diminished return, but will rise an additional quantum to reflect the uncertainty in future earnings predictability." [51]

Genzyme Corp, a major U.S. biotech company, experienced a real world example of these economic principles during the time President Clinton was trying to advance his Health Security Act in 1993. The threat of price controls had such an impact on Genzyme's ability to raise money for research that according to the CEO: "We raised $ 100 million for our new gene therapy product last year. If we tried to hold an offering today we couldn't do it. The threat of price controls has done more to damage the biotechnology industry than anything else that has happened in the industry's history." Similarly on March 13, 2000, comments by the White House that patents should not be granted for genetic material caused stocks in the biotech sector to lose 11% of their value in a single day. [52]

Part 5: Price controls in other countries and the effect on research in those countries

[50] Id.

[51] Jerry Stanton, Comment: Lesson to the United States from Foreign Price Controls on Pharmaceuticals, 16 Conn. J. Int'l L. 149.

[52] Id.

Comparing pharmaceutical research and development expenditures in the United States with amounts spent on pharmaceutical research and development in other countries further shows how pharmaceutical price controls stifle innovation. Since "most of the industrialized world beyond the United States has imposed some form of price controls on pharmaceuticals within their borders," the pharmaceutical industries in most other countries barely even come close to that of the United States when it comes to creating innovative drugs. Canada, in particular, nearly destroyed all research and development of new pharmaceuticals within its borders through its first attempt at price control, a scheme that involved compulsory licensing. Canada, by contrast with the United States, did issue a compulsory license on the ciprofloxacin patent in response to the Anthrax crisis demonstrating the difference in attitudes between the two countries when it comes to pharmaceuticals. [53]

Over the past decades, Canada has tried out several different price control methods. In 1968, the Canadian government responded to a finding that prices for patented drugs in Canada were among the highest in the world by enacting legislation requiring mandatory licensing of patented drugs to generic companies in Canada. The patent holders typically received a statutory licensing fee of no more than 4% so they retained little pricing power leaving them unable to recoup their research and development costs. Then parliament twenty years later realized that the 1968 law had undermined Canadian based pharmaceutical research, and Canada amended the patent act guaranteeing a period of market exclusivity. Under the Act to Amend the Patent Act in 1987, mandatory licensing could only be imposed after the first seven years of the patent; however, after the first seven years the mandatory licensing provisions and 4% royalty remained. In 1993, the Canadian government eliminated its compulsory licensing provisions in preparation for adopting the NAFTA treaty, which mandates twenty-year patent terms from the date of filing as well as the elimination of compulsory licensing except for in a few limited circumstances.

[53] Id.

Before the adoption of NAFTA, Canada established the Patented Medicines Price Review Board (PMPBR) in 1987. It gave the PMPBR power to determine a wholesale price that would give the patent holder a reasonable rate of return on its investment. In order to determine the wholesale price, the Canadian government gave the PMPBR power to compel manufacturers to disclose confidential information concerning their drug pricing. The Canadian government could enforce compliance with the PMPRB's information requests and pricing mandates by invalidating a drug's Canadian patent. [54]

In 1993, the Uruguay Round of GATT induced a change in the PMPRB's powers. As a result of the Uruguay Round, Canada had to expand the patent term to twenty years and remove the PMPRB's power to invalidate a patent. The Canadian government then gave the PMPRB the power to impose financial penalties instead. Manufacturers generally comply voluntarily with the PMPRB's requests for price reductions instead of undergoing formal hearings to impose price reductions. [55]

The PMPRB formulates drug prices by comparing foreign prices of the drug, comparing prices of similar compounds in Canada, and accounting for changes in the Canadian consumer price index. When a pharmaceutical company has an innovative product, the PMPRB prices it at a comparable rate to the price of the product in nine other countries. If the board decides that a product has minor or no therapeutic advantage over those already available or if the product is similar to one that's already on the market, the board will firmly tie the price to that of the preexisting drugs. The board may only consider manufacturing and marketing costs and not research and development costs when setting prices. [56]

The PMPRB undoubtedly has achieved its goal of lowering drug prices in Canada, but it has also attempted to increase investment in research and development in the Canadian pharmaceutical industry. The PMPRB did reach its goal of increasing research and development to a total of 10% of sales by 1991; however, the

[54] Id.
[55] Id.
[56] Id.

two other changes that occurred at the same time as the creation of the PMPRB in 1987, extended patent terms and the guarantee of seven years of exclusive rights before the government could grant compulsory licenses, probably contributed more to this increase than the creation of the PMPRB. Even so "Canada's 10% of sales is substantially lower than the 16% dedicated by the industry in the United States. Despite reduced delays for product approval, Canada remains a very small contributor to the world's pharmaceutical pipeline." [57]

France like Canada has traditionally imposed price limits on pharmaceuticals. The French government considers several factors in setting its drug prices including comparisons with existing products, therapeutic merit, and contribution to the domestic economy. Because the French government provides proscription coverage for all of its citizens, it imposes an additional revenue limit for drugs that account for a significant portion of government expenditures and cuts prices if necessary to stay within the limit. In 1994 the French government and the pharmaceutical agreement reached an agreement to give pharmaceutical firms more flexibility in pricing individual drugs while still limiting the total amount that the government spends on drugs sold by each individual company and overall. [58]

The United Kingdom's system of limiting drug prices differs somewhat from that used by Canada or France. In Britain, the government's National Health Service reimburses most drug purchases, and it distributes about 85% of prescriptions free of charge. The Pharmaceutical Price Regulation Scheme regulates that profits of pharmaceutical companies rather than directly regulating drug prices. The Pharmaceutical Price Regulation Scheme sets the limit on the total rate of return on capital of a company's portfolio of products sold to the National Health Service at an amount negotiated with the company, usually between 17% and 21%. The United Kingdom also has rules constraining pharmaceutical companies' expenditures including

[57] Id.
[58] Id.

limits on allowable promotional expenditures and allowable research and development expenditures as well as a limit on the allocation of expenditures between the NHS and exports. [59]

The United Kingdom has also taken some other measures in addition to the Pharmaceutical Price Regulation Scheme to keep National Health Service drug expenditures down. The Department of Health monitors "individual physicians for deviations from the norms in prescription expenditures. From 1979 to 1990 pharmaceutical spending in the United Kingdom grew at a rate of 3 to 5% annually," but in 1991 after the Department of Health started monitoring physicians real spending for drugs dropped by 1.3%. In 1993, the National Health Service further reduced it's pharmaceutical spending by another 2.5% by "[imposing] a three year price freeze, [eliminating] the allowable promotional expenditures for new drugs coming onto the market, and [mandating] a rebate if any individual drug's sales exceeded 12 million in any of the first five years on the market." [60]

Japan also has a method for controlling drug prices, but Japan's has devised a completely different system from that used in most other countries. In Japan, by contrast with most other countries, prescribing physicians rather than pharmacists normally dispense drugs. The government sets reimbursement prices for each drug and pays the reimbursement to the physician filling the prescription. Since physicians choose which drugs to prescribe, this system forces pharmaceutical companies to compete for the physician's prescription business by selling to him at a price lower than the reimbursement rate. A Japanese physician on average "derives a third of his income from this margin" so physicians have a large financial incentive to write prescriptions for the lowest priced drugs. The government continually pushes drug prices down by adjusting the reimbursement rate every two years based on the average price for the drug paid by physicians.

[59] Id.
[60] Id.

In spite of this program to lower drug prices, "Japan spends more of its health care dollars (or Yen) on drugs than any other industrialized nation. Japan has among the highest number of prescriptions per capita, and since nearly every physician derives substantial income from the margin system, the system is broadly entrenched and would be politically difficult to change."

The Japanese system provides a great example of the effect of distorting the market forces that provide incentives for pharmaceutical companies to invest in research and development. Japanese pharmaceutical companies can only obtain price increases by introducing new products, and this creates an enormous incentive to market drugs only slightly advanced from already existing drugs. Thus, for the large part, Japanese pharmaceutical companies produce only minor product extensions rather than truly innovative new drugs. The Japanese government has recently tried to fix this problem by limiting price increases to drugs that present a significant advance over current drugs. [61]

A study comparing pharmaceutical research and development expenditures within various countries was conducted from 1981 to 1991. The study analyzed eight industrialized nations, and found that the United States had seen the most rapid growth. According to the results of the study the United Kingdom was "the only country within the same league as the United States" in pharmaceutical research and development spending. Pharmaceutical companies in the United Kingdom had recently increased their spending at the time of the study, and "a comparison of R&D spending as a percentage of total pharmaceutical sales [showed] the U.K. returning nearly twice as much in R&D as compared to the U.S., while all other countries [lagged] far behind. This is consistent with the hypothesis that rate-of return regulation in the U.K. has encouraged R&D, or at least its location in Britain." [62]

[61] Id.
[62] Id.

A study of the quality of pharmaceutical innovation from 1975 to 1994 similarly found the United States and the United Kingdom at the forefront. The study broke down new pharmaceutical products in to two categories of significant innovations: truly innovative products, those that get marketed globally (in the top seven pharmaceutical markets), and less innovative but still significant, those marketed internationally (at least four of the seven major pharmaceutical markets). The study found that the United States contributed 45% of the global products introduced, the United Kingdom contributed 14% of the global products, and Switzerland contributed 8& of the global products. By contrast, "while France produced a significant number of new drugs, it ranks eight in global products. France and Italy had not introduced a global product since 1985. Japan [had] also introduced a multitude of new drugs, but fully 69% [were] rated neither therapeutic nor chemically innovative, and only 3% earned the rating therapeutic improvement and new chemical structure, the category representing the most innovative drugs." [63]

The United States has taken a unique position on pharmaceuticals by not imposing price regulation. The various regulation schemes employed in other nations have in every one of those countries with the exception of Britain stifled pharmaceutical innovation, and consequently "every one of these foreign countries has become dependent upon U.S., and to a lesser extent British firms, to innovate." Furthermore compulsory licensing, a scheme tried out briefly by Canada as described above, proved to have one of the most significant chilling effects of all the different regulation schemes. [64]

In Conclusion, the United States Department of Health and Human Services clearly made the right decision in dealing with the Anthrax scare and the need to stockpile ciprofloxacin. Negotiating a deal with Bayer allowed the United States to stockpile ciprofloxacin at a substantial discount while avoiding the negative consequences of issuing a compulsory license. Under 35 U.S.C. 1498, the United States government has the authority to

[63] Id.
[64] Id.

issue a compulsory license; however, the government may not have the authority under the TRIPs agreement. In fact, under the interpretation of the TRIPs agreement that the United States has adopted in previous situations when other countries wanted to issue compulsory licenses on pharmaceuticals, the United States most likely would have violated TRIPs if it had issued a compulsory license for ciprofloxacin. Furthermore, the policy decision to have strong patent protection and to not have price controls on pharmaceuticals in the United States has led to the development of a very strong pharmaceutical industry that leads the world in the development of innovative drugs. Issuing a compulsory license in this situation when the United States had many other options, such as negotiating with Bayer or stockpiling doxycycline in addition to stockpiling ciprofloxacin, would have sent a message to pharmaceutical companies that they could not rely on strong patent protection in the United States as they always had in the past. Nonetheless the power granted to the United States government by 35 U.S.C. 1498 to take a compulsory license played an important role in giving the United States a much stronger position in its negotiations with Bayer enabling the government to obtain a very favorable deal. Thus even where the United States chooses not to exercise its power to issue compulsory licenses, 35 U.S.C. 1498 plays an important role in that granting the government the power to grant compulsory licenses prevents companies with patent based monopolies from taking advantage of a public emergency.