

The Extraterritorial Dimension of Patent Law Systems

Rish Handa

Faculty of Law
McGill University, Montreal
August 2007

A thesis submitted to McGill University in partial fulfillment of the requirements of the degree of LL.M.

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Ottawa ON K1A 0N4
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Your file Votre référence
ISBN: 978-0-494-51419-1
Our file Notre référence
ISBN: 978-0-494-51419-1

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Abstract

This thesis analyses the extraterritorial dimension of patent systems in light of recent judicial trends, ending with the United States Supreme Court's landmark 2007 ruling in *AT&T v. Microsoft*. The discussion examines (i) the economic interest of nations in issuing and maintaining patent rights; (ii) the legal arguments against a unilateral extraterritorial extension of domestic patents, leading to the legal presumption against extraterritorial extension; (iii) the evolution of this doctrine in United States legislation and jurisprudence and forays against it, especially in recent decades; and (iv) the impact of globalization and of the nature of patentable information in the digital age on the issue of the extraterritorial extension of patent rights. The general conclusions are that, in the modern age, patent rights need to be extended beyond the domestic jurisdiction, and that the appropriate manner for nations to achieve this extension is not unilaterally but through bilateral and multilateral treaties.

Résumé

Cette thèse entreprend une analyse détaillée de la dimension extraterritoriale des systèmes de brevet à la lumière des évolutions jurisprudentielles récentes, jusqu'au revirement de 2007 opéré par la cour suprême des Etats-Unis dans *AT&T v. Microsoft*. Cette discussion examine (i) l'intérêt économique des nations à accorder et maintenir les droits de propriété industrielle; (ii) les arguments juridiques contre une extension extraterritoriale unilatérale des brevets domestiques à d'autres juridictions, entraînant une présomption juridique contre l'extension extraterritoriale; (iii) l'évolution de cette doctrine dans la législation et la jurisprudence américaines et l'opposition qu'elle a rencontré, particulièrement au cours des dernières décennies; et (iv) l'impact de la mondialisation et de la nature d'information patentable dans l'ère numérique sur la question de l'extension extraterritoriale des droits de propriété industrielle. Au terme de cette discussion, il semble qu'aujourd'hui, les propriétés industrielles doivent être prolongées au delà du cadre domestique; la meilleure manière de réaliser cette extension se trouve non dans une action unilatérale mais dans des traités bilatéraux et multilatéraux.

Acknowledgements

I would like to thank Prof. Tina Piper, Faculty of Law, McGill University, for her invaluable support and insightful contributions and without whom this thesis would not have been possible.

I would also like to thank my family for their patience and invaluable support.

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Chapter 1

The Extraterritorial Dimension of Patenting Systems

1. Introduction

The focus of this thesis is on (i) the economic interest of nations in issuing and maintaining patent rights and in the extraterritorial application of these rights to foreign jurisdictions; (ii) the legal arguments against a unilateral extraterritorial extension of domestic patents to other jurisdictions, thereby reinforcing what is known as the legal presumption against extraterritorial extension; (iii) the evolution of this doctrine in United States legislation and court decisions and the forays against it, especially in the past half-century; and (iv) the impact of globalization and of the nature of patentable information in the digital age on the issue of the extraterritorial extension of patent rights. The general conclusions from the above discussion are that, in the modern age, patent rights need to be extended beyond the domestic jurisdiction, and that the appropriate manner for nations to achieve this extension is not unilaterally but through bilateral and multilateral treaties.

In addition to setting forth a few key principles behind the extraterritoriality debate, this chapter describes the case for extraterritorialism – that the economic interests of patent holders and governments are advanced by the extension of patent rights internationally. While the term “extraterritorialism” may technically refer to any extension of patent rights beyond the domestic jurisdiction, its application in this text will be restricted to the unilateral application of local patent policy to foreign patent jurisdictions by assuming jurisdiction over instances of foreign exploitation of a domestically-patented invention. The remaining chapters seek to discredit the

extraterritorialistic approach, arguing that, ultimately, such an approach will impinge on the sovereignty of other nations, invite retaliation, place nations in unequal bargaining positions leading to the subjugation of patent rights in certain jurisdictions with regards to other jurisdictions, and involve enforcement problems.

1.1. The legal presumption against the extraterritorial extension of patents

Barring international agreements on the extraterritorial extension of patents, the recognition by national courts of the inherently territorial limits of their jurisdiction implies a presumption against such an extraterritorial extension of domestic patent rights to foreign countries. In general, a country cannot enforce patent rights in foreign jurisdictions when those jurisdictions do not recognise and permit such an extension. In the past, the extraterritorial application of patent rights has not been of great concern due to a relatively clear line demarcating legitimate enforcement from jurisdictional trespass. However, changing factors including transformations in the nature of patentable subject-matter and globalization trends have obfuscated this line, resulting in the overbearing behaviour of patent regimes assuming jurisdiction over extraterritorial activities.

1.2. The economic interests of patentees and governments in the extraterritorial extension of patents

The push for extraterritorialism arises from the economic interests of patentees and governments. A patent benefits the patentee by its conferment of the exclusive right to exploit the invention patented, either by exercising the right directly or through licensing the technology. It gives its holder the exclusive right to commercialize and

decide who manufactures the innovation for a set period of time. While not all patents lead to production or licensing, many do so and increase the economic return to the patentee. On the whole, a patenting system that leads to significantly more inventions in a country is also likely to benefit the country in which the patentees reside by increasing its production capacity.¹ A government's objective in implementing national patent policy is to not only encourage the development of local innovation and the influx of knowledge, but to increase the economic benefit achieved from domestic knowledge. The potential benefit lost to the unregulated exploitation of domestic knowledge by foreign manufacturers defies this objective. For instance, in the international arena, if the patented innovations increase the efficiency of production in the domestic economy relative to that in other economies, as some patents do, the country may be able to achieve additional benefits in the form of greater exports and lower imports. Alternatively, if the patent were to be licensed to firms in other countries, there would be a flow of royalties to the domestic country.

These potential advantages to the nation in which the patentee resides become greater if patent protection can be extended from the domestic sphere to the international one.² The larger the extraterritorial reach of the patents granted, the greater the benefits to the patentees and the country. Without the protection of domestically patented subject-

¹ Patent policy may also benefit a nation militarily, promoting inventions that provide strategic military advantages, which increase the military power of the country relative to other countries. Innovations often underlie a country's ability to produce the fastest military planes, the fastest tracking devices, the most effective bombs, etc. Some of these innovations are not patented in order to maintain their secrecy, but some are. The products incorporating the innovations do provide a military benefit to the country itself in terms of its ability to wage war – or threaten to do so. Additionally, such products are also often exported to the nation's military allies.

² Some authors claim that the objective of the United States in its patent policy was to extend the reach and power of U.S.-based multinational corporations in other countries, thus providing trickle down benefits to the U.S. economy.

matter abroad – whether by the unilateral assumption of jurisdiction over foreign activities, by patenting abroad, or through international treaties – foreign producers can exploit domestic patents at will and without cost (“free-riding”), limiting the benefits of the patent for both the patentee and the country of the patent.³ Therefore, it is in the interest of the patentee and his country to broaden the exclusive rights over exploitation of the patent to cover not only the domestic jurisdiction but foreign countries as well.

However, while domestic laws and courts can grant exclusive rights of exploitation of the patent domestically, it is in the interests of other countries to disallow “intraterritorial” extensions of foreign patent regimes.⁴ Such an extension is an affront to principles of international law, including state sovereignty and rule of law, as it impinges on a nation’s ability to self-determine its domestic policy.⁵ Thus, absent a corresponding foreign patent or international treaty, foreign firms would be free to use the innovative knowledge found in the domestic patent in their own production.

An alternative approach to the extraterritorial protection of a patent is for the patentee to obtain corresponding patents in other countries. However, for an individual patentee, given the number of countries in the world and their differing patent laws, this avenue is often too costly to pursue except in a few countries.⁶ Further, this route does

³ This situation occurred in the early stages of U.S. industrial development in the eighteenth and nineteenth centuries when the U.S. did not recognise British patents, so that unless they were patented in the United States, American firms were free to copy British patents. It occurs now in the case of the generic production of U.S.-patented drugs in countries that do not recognise American patents and do not subscribe to international agreements providing protection to such patents.

⁴ The term “intraterritorial” will be used to denote applications of foreign law to domestic activities.

⁵ A more in-depth discussion of domestic self-determination will be discussed as part of the territorialistic approach in Chapter 4.

⁶ From an economic viewpoint, patenting in a jurisdiction would depend upon the cost of patenting versus the revenues from doing so. In many countries, the market is very limited for certain technologies, e.g., Blackberries in Burkina Faso, so that the patenting in such a country may not yield a net profit, so that the patent holder may decide not to patent in it. The patent holder of a production process in the domestic

not necessarily benefit the country of origin of the patent since some of the production based on the patent would move to other countries. Instead of relying upon a patentee to seek foreign patents in each and every jurisdiction of potential production capacity, which is often beyond the means of small and mid-size firms, it may be prudent to examine the interests of nations in entering into international agreements that extend patent protection beyond the domestic jurisdiction. These interests are discussed, in brief, later in this chapter and in more depth in Chapter 4.

1.3. Clarifying the interpretation of patent rights in the domestic jurisdiction

Patent rights usually comprise exclusive rights to production, sale, and use of the patented invention in the domestic jurisdiction. The following cases serve to clarify some of the issues involved in the extraterritoriality debate:

- I. Assume that the patent on the production of a product X is granted to firm A in (the home) country H and is not patented in (the foreign) country F but is, nevertheless, produced by firms in country F, without any licensing by firm A. This production output is wholly sold in country F. If there is no extraterritorial extension of the patents in H to include country F, the production by the country F's firms does not violate the patent in H.
- II. Now, suppose that some of country F's output of product X is exported to country H. Does this violate the patent rights of country H's firm A? The prevention of such imports from country F to country H can be justified on the ground that the sale of product X in country H by country F's firms is

jurisdiction may also decide not to patent it in a country that does not possess the industrial capacity or worker's know-how to use it.

tantamount to the indirect production of product X in country H by country F's firms. This interpretation of the rights granted by country H's patent regime does not infringe the rights of country F's firms to use the patent for production in country F but does limit its rights to sell the product in country H, thereby stopping it from acting as if it had produced the product in country H. However, while this seems to be the pre-eminently sensible interpretation, another (odd!) interpretation would be to protect the exclusive rights to production, but not hinder imports from F to H.

- III. In the third scenario, suppose that the product X is an essential part of a ship (or plane) produced in country B, which temporarily enters into the territorial waters (including the air space and airports) of country H to trade, but the products it brings from country F to country H are not covered by the patent. For clarification, note that the transport vessel in question is not sold in country H; however, its services do occur while it is in country H's territory. On this, there can be two different interpretations of the patentee's rights. The logical extension of the exclusive right to production and sale by the patentee in country H would seem to imply that this use, no matter that it is temporary and in transit, infringes the rights of the patentee in H to the exclusive production and use of the patented products in the territory of country H. The alternative interpretation would deny the right of the patentee to prevent such usage.

The preceding three scenarios illustrate the possible interpretations of how far the patentee's rights in the domestic jurisdiction can be restricted or made to extend. The

narrower these rights, the lower are the profits from the patent and the less is the incentive to invest in research and development, and in turn, the less the resulting innovation.

A case that has also seized attention in recent years involves exports to third-party countries. For an illustration of this case, the following scenario IV is more relevant.

- IV. Suppose that there are three countries: country H, which is the patentee's home country, and countries F and C which do not enforce country H's patents. Suppose firms in country F manufacture products (e.g., medicines for AIDS) based on the patent and can do so more cheaply because they have lower labour costs. Also, since they did not incur the R&D costs leading to the patent or the marketing costs that popularized the product, they can sell at prices well below the prices charged by the patent-holder in country H. They can do so not only in their own country but also in the third country C, which has no production of its own but has a market for the product. To maximize their own profits, the patent-holders in H would want to deny producers from country F the ability to sell the product in country C. They cannot do so without the extraterritorial extension of their patent rights to country C, such as by patenting in country C. Without the enforceability of this right in country F, the patent-holders in country H will lose country C's market to producers in country F. Therefore, the patent-holders in country H as well as country H itself would seek to obtain, e.g., by a treaty, the extraterritorial extension of their patent rights to country C so as to deny country F's firms the sales in country C. But it is against the interests of firms in country F and of

country F itself to agree to such extraterritorial extension of country H's patent rights to country C, or if such an obligation exists under some international agreement, to try to evade it. It is also against the interests of country C's consumers to restrain sales from country F since it gets the products more cheaply from country F than from country H.⁷

1.4. The consequences of disclosure in the international arena

The elimination of free-riding by other nations is dependent on a nation's ability to preserve domestically-generated innovative knowledge within territorial borders. The interests of the patentee are to withhold, keeping confidential, the new information that is the basis of the patent. However, the country's interest is usually to require the patentee to disclose the new information that leads to the grant of the patent and this information is made publicly available by the patent office. The country's interest in such disclosure is to disseminate the new knowledge in the patent to its own residents so as to further promote innovations domestically. However, the advantage to the patentee's country from such disclosure becomes limited by the extent to which foreign developers also get access to this knowledge and can use it to produce and patent new knowledge abroad.⁸

⁷ In such a case, the patent holder in country H may decide that it is in its economic interest to patent (or not) in country C, thereby denying F the market in C. However, C may decide that it is in its interest to deny patents for the class of products under discussion or even for all innovations.

⁸ Consequently, patent holders try to disclose as little information as they need to for getting the grant of the patent. See Stephen M. McJohn, "Patents: Hiding from History" (2007) Suffolk University Law School Research Paper No. 07-27, online: SSRN <<http://ssrn.com/abstract=969447>>. In some cases, innovators decide that it is in their interest not to patent but to rely on trade secrecy. See Petra Moser, "Why Don't Inventors Patent?" (2007) NBER Working Paper No. 13294. Moser argues that "the ability to keep innovations secret is a key determinant of patenting" (Moser at 1). She further notes that "(1) [i]nventors patent only a small share of innovations, (2) inventors' propensity to patent varies strongly across industries, and (3) scientific breakthroughs, which facilitate reverse-engineering, increase inventors' propensity to patent" (Moser at 30).

The obvious recourse would be to limit access to knowledge to domestic residents and deny access to foreigners, so that only domestic and not foreign firms are able to benefit from the disclosure in patents.⁹ This is virtually impossible to achieve in the modern age.¹⁰

1.5. Economic arguments on the extension of patent rights through international agreements

The preceding arguments imply that unless free and costless foreign use of the knowledge in domestic patents is prevented or restricted (e.g., by the extraterritorial reach of the domestic patenting system), the benefits to both the patentees and the patenting country become limited. It is, therefore, to the advantage of the patentees and their governments to push for the extraterritorial application of the domestic patenting system. But this raises severe legal issues about enforceability in foreign jurisdictions, unless the foreign country legally allows such enforceability.

Looking more closely at the extraterritorial application of patents, compare the case of a country, say A, which generates a considerable number of patents with one, say B, which generates very few. Historically, this has always been a common scenario.¹¹ In the current world context, the United States, which is only second to Japan in the generation of patents, annually generates more than double the number of patents of the

⁹ This is also so for knowledge which is not patented but is disclosed in academic journals and books.

¹⁰ See section 1.7, below, for a detailed discussion on the impact of globalization on the worldwide dissemination of patentable knowledge.

¹¹ See e.g. *infra* note 15, regarding worldwide patent production in 1921.

next largest patent producer.¹² It is clearly in the interest of country A to want the extraterritorial extension of its patents to cover country B, while it is in the interest of country B to deny such extension, even if it is offered in exchange for the extraterritorial extension of its patents to cover country A.

Given the lopsided nature of the sizes and stages of industrial development, as well as the generation of patents among the various nations of the world, the *prima facie* presumption is that most countries will not allow the extraterritorial extension of foreign patents to their country, thereby allowing their residents to take advantage of foreign patents. If this involves production, the items thus produced are items often referred to as “fakes”, whose production may nevertheless be legal in their country of manufacture, as well as their exports to countries that do not subscribe to the patents in question. Even if there is no local production of the items in question, the country not subscribing to foreign patents may still benefit by being able to import such fakes at cheaper prices than those produced by the patent holder and the licensees of the patent. An example of this is currently provided by the importation into several African countries of cheap “fake” generic copies of drugs, patented in the United States and European, by countries such as Brazil and India, which do not subscribe to the relevant patents. The residents of those countries also benefit from the cheaper supply of such drugs as against the higher prices of the drugs produced by the patent holders and their licensees. Their firms that produce the “fake” generic version also benefit in terms of increased profits.

¹² WIPO, “WIPO Patent Report: Statistics on Worldwide Patent Activity (2007 Edition)”, online at: WIPO <http://www.wipo.int/ipstats/en/statistics/patents/patent_report_2007.html>, Chart J.3, “J.3 Patents Granted by Country of Origin”. In 2005, residents of Japan were granted 185,827 patents and U.S. residents were granted 134,019 patents. The next largest number of patents granted was to residents of the Republic of Korea, with 63,865 patents being granted that year.

Further, countries may benefit from allowing their residents to obtain domestic patents that are based on knowledge easily available in foreign countries or on the basis of which foreign patents were already granted. Even if the patent laws do not allow this openly, domestic residents may try to patent slight or inconsequential variations of the knowledge easily available in foreign countries or on the basis of which foreign patents were already granted.¹³ There is, therefore, substantial scope for conflict and chaos across countries in the extraterritorial dimensions of patenting systems.

As argued above, it is to the net advantage of countries that generate relatively more patents to ensure the extraterritorial extension of their patents to other countries, even if they have to offer as a *quid pro quo* the extension of foreign patents into their own territory.¹⁴ As will be explored further in later chapters, this thesis suggests that the best way to accommodate the latter extraterritorial extension is through bilateral and multilateral international agreements and not unilaterally.

1.6. The shift in the interests of the United States on the extraterritorial extension of patents

The economic interests of the United States have shifted since its inception, such that where an extraterritorialistic patent policy would arguably not have benefited the nation in the past, it may now do so. This shift is primarily based on the principle, as examined above, that the country that generates substantially more patents has a stronger

¹³ The appropriation and monopolization of existing, foreign-based knowledge is at the heart of the current traditional knowledge debate. For instance, U.S. manufacturers have received patents on several varieties of Indian rice grains (e.g., Basmati), affecting Indian rice exports.

¹⁴ See Peter K. Yu, "Currents and Crosscurrents in the International Intellectual Property Regime" (2004) 38 Loy. L.A. L. Rev. 323 (pointing out that bilateral and multilateral agreements on intellectual property have been pushed by developed countries, which generate the most patents, on other countries).

interest in the extraterritorial extension of its patents than a country that generates less. In the late eighteenth century when the U.S. Constitution was drafted, the United States possessed a relatively inferior economy compared with those of Britain and France. Britain was already undergoing the Industrial Revolution, which had its basis in a remarkably large number of major innovations. It definitely generated more innovations than the United States, whose industrial economy was in a more nascent state. Given the much smaller number of patentable innovations generated in the United States, its economic interest lay in not allowing the extraterritorial extension of foreign patents to it and, as a *quid pro quo*, not to push for the extraterritorial extension of its patents abroad.

The relatively smaller number of patents generated in the United States, compared with Britain, continued from the eighteenth to much of the nineteenth century, such that the economic interest of the United States during that period was to oppose the territorial intrusion of foreign patents, even if it meant foregoing the extraterritorial extension of its patents to other countries. Evidence of this lies in the reluctance during the eighteenth and nineteenth centuries of the United States to push for international agreements, especially bilateral ones between itself and Britain, which might have provided the extraterritorial extension of patents between them.

By the early twentieth century, not only did the United States possess a highly industrialised economy, it had become a powerhouse of inventions. It was producing more patents than any other country, including Britain.¹⁵ Consequently, its economic

¹⁵ For instance, in 1921, 33,835 patents were granted to U.S.-based inventors. Not only did this amount trump the 9,085 patents granted to U.K. residents, but no other country had issued that many patents to both residents and non-residents, combined. The next closest nation was Germany, having granted 12,537 to resident inventors. WIPO, "Patents Granted by Office (1883 to 2005)", online at: WIPO <<http://www.wipo.int/ipstats/en/statistics/patents/100years-granted/index.html>>.

interest shifted to the extraterritorial extension of its patents. By 1945, the United States had emerged as the dominant economic and military power in the world, such that it could support its economic interest by pushing for bilateral and multilateral agreements allowing for the effective extraterritorial extension of its patents.¹⁶

Contrary to the economic stance of the United States in the post-1945 period, the economic interests of nations that generated fewer patents remained best served by fending off the intrusion of foreign patents and refusing to accede to provisions in bilateral and multilateral agreements relating to the extraterritorial extension of patents. Or, if these nations had, for some reason, signed bilateral and multilateral agreements relating to the extraterritorial extension of foreign patents, to not effectively implement the ban on the unauthorized adoption of such patented technology.¹⁷

The preceding discussion forms the background to the stance of successive U.S. governments and their enactment of legislation, for or against the extraterritorial extension of patents. As argued above, this stance has not remained unchanged but rather

¹⁶ To achieve this, the United States sometimes employed economic, political and even military pressure on foreign countries. See Yu, *supra* note 14 at 419-21. Yu argues that bilateral and multilateral intellectual property agreements in recent years have been pushed by developed countries on the less developed ones and that the U.S. exerted military pressure on other nations, including China, in this regard. Peter Drahos points out that the U.S. "strong-armed" other nations while negotiating TRIPS. Peter Drahos, "Global Property Rights in Information: The Story of TRIPS at the GATT" (1995) 13 *Prometheus* 6, reprinted in Peter Drahos, ed., *Intellectual Property* (Aldershot: Ashgate Dartmouth, 1999) at 419.

¹⁷ For instance, China is renowned for intellectual property theft and the proliferation of counterfeit products due to poor enforcement mechanisms. See European Commission, News Release, "Intellectual Property" (8 November 2006), online at: European Commission <http://ec.europa.eu/trade/issues/sectoral/intell_property/pr081106_en.htm> ("China was the source of more than half of the counterfeit goods intercepted at European borders in 2005. A European Commission consultation with European businesses in Spring 2006 identified China as by far the most problematic market for counterfeiting and abuse of intellectual property rights for European companies. [...] The problem is no longer confined to fake luxury items but now includes fake foods and drinks, fake electrical appliances fake car and aircraft parts and fake medicines including birth control pills and HIV drugs - many of which are destined for the developing world.").

has shifted in the period since the formation of the U.S. Constitution in the eighteenth century.¹⁸

1.7. The impact of globalization

Globalizing trends have played a significant part in the increasing need for the international extension of patent rights. As argued above, the extraterritorial extension of patents may both increase profitability for the patentee and may economically benefit the patenting country.¹⁹ In the absence of agreements guaranteeing such extraterritorial extensions, both the patentee and the patenting country can continue to benefit if the disclosure information on the patent is sufficiently slow to reach other countries. Further, even without extraterritorial extensions, the benefits of patents can continue to exist within the domestic economy if the commodities whose production does take advantage of the patented knowledge cannot physically reach the patentees' country or can only do so after incurring such high transport and insurance costs that they would not be competitive. In short, foreign commodities whose production embodies the patented knowledge cannot effectively become imports and compete with similar domestic products arising from the patent. Therefore, the pattern of high communication and transport costs and delays serves to provide considerable protection to the patentees and the patenting country from the extraterritorial exploitation of the patents. Such a pattern for many products continued to exist up to the latter half of the twentieth century.

¹⁸ Historically, such a shift is likely to have occurred, though at different times and in different degrees, not only for the United States but also for some other countries as they went through the Industrial Revolution.

¹⁹ This argument refers to economic interest. Since a unilateral pursuit of this interest violates principles of international law governing relations between sovereign countries and even evokes symptoms of economic colonialism, this thesis argues that the economic interest is best accommodated by treaties and agreements.

The globalization trend in recent decades has drastically altered the above pattern, which had been based on high communication and transport costs and delays. Communication delays have almost vanished: the knowledge of a new patent can be transmitted by e-mail almost without delay and at very low cost to foreign countries. The time required to get the products to other countries has also decreased considerably with most goods moving by airfreight rather than by trains and ships, which for most of the nineteenth century were mainly sluggish sailing ships. Transport costs have come down drastically such that they are only a fraction of the market prices of most products. These developments have diluted the advantage that the patentees were granted in the domestic market and the extra profits that they could earn by virtue of their patents.

From a national perspective, if the economic incentives, manifested in a nation's ability to grant patents to inventors, suffer severe dilution, there is likely to be a reduction in the expenditures on local research and development – investments necessary for progressive innovation. This strikes at the *raison d'être* of the patenting system. To maintain this *raison d'être*, the country must somehow deny other countries the potential advantages arising from its patents.

In short, globalization creates an imperative for the international extension of patents if the patenting system is to continue to maintain its incentives to promote the domestic research and development expenditures leading to innovation. The courts cannot directly address this imperative, but governments can do so through bilateral and international agreements establishing the mutual recognition of each other's patents. No wonder, then, that such agreements have proliferated in recent decades, concurrent with a rising intensity in the forces of globalization. The courts are also involved in this process

since they may be called upon to interpret and apply the relevant provisions of such agreements.

1.8. Issues arising from patent rights in the information age

In the past, territorial delimitations of law were necessary to the assertion of absolute sovereignty. This no longer holds true. The emergence of the information age has not only allowed for the facilitated transmittance of but also for the transcendence of information across political borders, as sovereign states, with territoriality as the governing principle of international law, are left to contend over the distribution of information in a global arena.

The diffusion of information distribution from a territorial to global domain poses problems for patent regimes, which were originally premised on territoriality. Information, including that relating to innovation, can no longer be easily controlled by any one state, resulting in the possible applicability of differing intellectual property systems to the same information and hence different approaches towards protecting the same information. This is particularly problematic when the operation of an invention that is patented in at least one state, straddles political borders. The question then arises as to the extent to which domestic patent laws can affect the use of inventions outside national borders.

The territorial elusiveness of patentable information poses significant problems for intellectual property policy, especially since international accord in the field is in a

nascent stage. Currently, patent systems and laws can vary from state to state.²⁰ The application of a domestic patent regime across international borders places that regime into conflict with the patent laws of another jurisdiction. If left unresolved, this conflict can also undermine the protection of information internationally by injuring the credibility of the weaker patent regime. Thus, the expansion of patent law across national borders is of great importance to the development of both autonomous intellectual property regimes and international harmonization schemes.

The extraterritorial extension of patent law also signals a movement towards a distinctive informational identity, where nations not only seek to claim geographic territory but also informational territory. Yet, technological advancement has outpaced the notional constructs underlying approaches to its regulation and protection; contemporary intellectual property systems were not established with such disparity between information and physical location in mind.²¹ There has been some debate about the virtues of technological neutrality under the patent regime, yet a clear imperative exists to regulate extraterritorial extensions of patent with respect to certain technologies that are prone to transnational exploitation. For instance, as will be examined in a series of cases in Chapter 3, patents based on software and information-based technologies have become the subject of recent litigation due to their particular nature, including the low cost, rapidity, and ease of their transmission and replication.

²⁰ However, patent law, even though relatively new, is probably one of the most harmonized areas of domestic law (as compared, for instance, with property law).

²¹ Software technology is at the root of many of the key cases involving the extraterritorial application of patent law. The intangible and easily transmissible nature of software often allows the location of software's use to be detached from the physical location of the components upon which it is loaded.

For the cogent functioning of this new dynamic of national patent regimes in a non-national informational domain, new rules must be established between nations. Additionally, if national informational identity is to be preserved in the long-term, its safeguarding must not jeopardize the potential for parity, internationally. As will be discussed in the forthcoming chapters, this may be best accommodated by bilateral and multilateral treaties.

2. Chapter map

The beginning of this chapter laid out the issues examined in this thesis and also specified the general nature of its conclusions. There are three main aspects to the discussion. First, the economic interests of the patent holder and the patenting country favour the international extension of domestic patent rights. In general, the economic benefits to both of them are greater the larger the area over which the patent rights can be made to extend. Second, principles of international law and the potentially negative effects on national patent regimes suggest a presiding presumption against the unilateral, extraterritorial extension of domestic patent rights to foreign jurisdictions. Third, given the legal presumption against extraterritoriality, the best way to accommodate national economic interests is through international agreements that grant such the international extension of patent rights.

The extraterritorial dimension of patenting systems will be examined in Chapters 2, 3, and 4, in three discrete stages: (1) the scope of legislative authority behind patent law and the statutory crystallization of extraterritorial policy; (2) the extensions and limitations imposed on the extraterritorial application of domestic patent systems abroad

via judicial interpretation; and (3) the impact of extraterritoriality on national patent regimes and international patent law.

Chapter 2 discusses the analytical foundation for patents and the evolution of patent legislation in the United States from the eighteenth to the twentieth centuries. Further, for this period, the chapter examines the American legislature's justification for enacting provisions of extraterritorial effect, and of the courts in adhering to a presumption against the extraterritorial application of domestic patents rights to other jurisdictions. Chapter 3 provides an analytical examination of the approaches of the U.S. judiciary towards extraterritoriality of patent law, focusing on the developments in patent law during the late twentieth century, especially on the patent rights in the digital age. Chapter 4 follows with a discussion of international relations and legal theory. Its focus is on international treaties in the globalization age and their interaction with domestic jurisdictions. Chapter 5 provides the summary and conclusions of this thesis.

Chapter 2

Patent Regime Policy & Legislation

1. Introduction

At the base of the patents pyramid lies the foundational purpose for having patent law. An understanding of the underlying rationale for the existence of patent law is critical to assessing its extraterritorial application. This rationale and the issues it raises were discussed at a general level in Chapter 1. The rationale relates to the need to provide economic incentives to innovators to pursue research and development, which often involves a significant economic burden. The patent rights conferred provide these economic incentives and may also benefit the country issuing the rights as a result of production and commercialization of the patented technology. Additionally, patent protection enables both the patent holder and national industry to stay ahead of competitors in other countries, so that its exports increase and imports decrease. This rationale is again discussed in the first section of this chapter.

On the extraterritorial dimensions of patents, Chapter 1 also pointed out that, relative to Britain, the United States had fewer patents in the eighteenth and nineteenth centuries, but considerably more during the twentieth century, as it does now. This transformation shifted the economic interests of the United States regarding the extraterritorial extension of its patents abroad, in *quid pro quo* of the reciprocal extension of foreign patents to the United States. The chapter also pointed out some of the issues raised by globalization regarding the need for the extended application of domestic patents across international borders.

The next level of the pyramid is dedicated to the legal source of patent law. This chapter focuses on this second level of the pyramid as specified in the earlier sources of American patent law, namely the U.S. Constitution and patent legislation, and the rights and limitations that they engender. This chapter presents their relevant provisions, drawing particular attention to the issue of extraterritoriality. The discussion will examine the U.S. legislative stance on extraterritoriality, spanning from the promulgation of the U.S. Constitution to roughly the middle of the twentieth century. In particular, the later parts of this chapter will trace the lead up to and political motivation for enacting legislation with extraterritorial effect. The discussion will be specifically geared towards the development of 35 U.S.C. 271(f), passed in 1984, which is the particular section of the U.S. patent statute that relates to extraterritoriality. The analysis will spotlight the dual standard between the provisions targeted at domestic patent violations and those targeted at foreign ones. The landmark judgments relied upon for the analysis in this chapter are *Brown v. Duchesne* and *Deepsouth Packing Co. v. Laitram Corp.*

Whilst Chapter 1 briefly introduced two themes central to a discourse on extraterritoriality, namely the economic rationale for an expansive patent policy and the countering reasons for a presumption against extraterritoriality, Chapters 2 and 3 expand on these two themes and transitions from the discussion of these issues at the general level to their instantiation in the context of the United States. Chapter 3 will extend this analysis of extraterritoriality in patent law into the judicial sphere, focussing on the extraterritorial scope of U.S. patent provisions as interpreted by the courts.

In brief, this chapter reviews the rationale behind instituting patent policy, scrutinizes the provisions of the U.S. Constitution related to patents as communicating a

presumption against extraterritoriality, and then tracks and analyzes the development of 35 U.S.C. 271(f).

2. *Patent law's raison d'être*

As discussed in Chapter 1, the driving force behind patent law is fairly simple – to foster innovation.¹ Patent law functions to encourage further research and development by conferring on the innovator certain legal rights over a certain period for the use of his or her innovation. Specifically, patent policy spurs stand-alone innovation by (1) limiting free-riding, (2) facilitating commercialization, and (3) encouraging disclosure.²

Innovation takes time, money, and creativity to generate. It is in the interests of the inventor to be able to maximize the profit from the investments made in the conception of the invention.³ Without a legal right to their exclusive use by the innovator, the invention would be open to duplication by others, or “free-riding”, that can reduce the

¹ While patent policy exists to further innovation, only a small share of innovations is patented. Many inventors choose secrecy over patenting. Petra Moser notes that whether or not an inventor chooses to patent is dependent on the ability to keep an innovation secret, which varies strongly between industries, such that an inventor is more likely to patent in industries where secrecy is risky. Consequently, significant scientific breakthroughs increase the propensity to patent since they lower the effectiveness of secrecy. Moser, *supra* Ch. 1 note 8.

² Federal Trade Commission, Report, “To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy” (October 2003), Ch. 2, “The Role of Competition and the Patent System in Spurring Innovation”.

³ There has been some debate as to the extent to which an inventor should be allowed to profit from an invention, relative to the social value of the invention. See Mark A. Lemley, “Property, Intellectual Property, and Free Riding” (2005) 83 Texas Law Review 1031 (arguing that the rhetoric of free-riding in intellectual property is misguided as inventors should not be able to capture the full social value of their inventions); accord Carl Shapiro, “Patent Reform: Aligning Reward and Contribution” (2007) NBER Working Paper No. 13141 (suggesting that economic efficiency and innovation can be more effectively promoted in a system that properly balances rewards to patent holders with their social contributions).

amount of remuneration to be obtained by the inventor from the commercialization of the invention.⁴

If this amount of remuneration is not sufficient to recompense the inventor for the initial research and development costs incurred in the invention's creation, and the inventor had foreseen this negative net return, a profit maximizing inventor would not have chosen to invest his time and resources in developing the invention.⁵ Even if there is a positive net return, it would be much less if others can, without any recompense to the inventor, freely use the invention than if a patent prevents them from doing so.

While it has been suggested that patent laws may not directly increase levels of innovative activity, it has been shown that they influence the direction of innovative activity into industries that may not have seen as much activity without patent laws.⁶ Innovation in certain industries, such as the pharmaceutical or biotechnology industries, is highly dependent on patent protection as significant and costly amounts of pioneering research and development (R&D) are required.⁷ Patents allow a company to recoup its

⁴ Wesley M. Cohen, Richard R. Nelson, John P. Walsh, "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)" (2000) NBER Working Paper No. 7552 (suggesting that patents are being increasingly relied upon by larger firms and that "[i]n addition to the prevention of copying, the most prominent motives for patenting include the prevention of rivals from patenting related inventions (i.e., patent blocking'), the use of patents in negotiations and the prevention of suits").

⁵ Note that some inventors do not work according to this profit calculus, but may engage in inventing activities for the sake of personal satisfaction or for some other reason. However, while this may be so for individuals, public corporations are unlikely to incur research and development expenditures if they are not expected to increase their profitability. Patents are one of the tools that they can employ to increase the profits from their innovations.

⁶ Petra Moser, "How Do Patent Laws Influence Innovation? Evidence from Nineteenth-Century World Fairs" (2003) NBER Working Paper No. 9909 at 38-39. Cf. Manuel Trajtenberg, "A Penny for Your Quotes: Patent Citations and the Value of Innovations" (1990) 21:1 *The Rand Journal of Economics* 172 (noting that while patent counts are not a direct reflection of innovative output, they may still be regarded as a measure of innovative activity; they are more than just an input in the innovative process (e.g., R&D) as they reflect "effort" and "a modicum of technological success" in the innovative process).

⁷ Federal Trade Commission, Report, "To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy" (October 2003), Ch. 3, "Business Testimony: Current Innovation Landscape in Selected Industries".

R&D expenditures, without which a company would not be able to profit from its innovation.⁸ Investors, requiring a return on their investment, would be hesitant about lending to a project with negative profitability. Consequently, without patent protection, such enterprises would not be able to attract the necessary capital to conduct the initial R&D.

Pragmatically, the incentives to undertake the research and development activities resulting in inventions would be much smaller in the absence of a patent.⁹ The consequence of this reduction in incentives is likely to be a reduction in research and development and in the quantity, quality, and novelty of resulting inventions. Conversely, people would have a greater incentive to duplicate the inventions produced by others: they would just replicate existing products developed by others or just make minimal improvements to them. In turn, this would likely decrease the incentives to pursue research and development initiatives.

Further, patents can help facilitate commercialization of an invention by enabling licensing negotiations, which may have been difficult if the inventor had to rely on secrecy to prevent free-riding by competitors.¹⁰

The current patent system was developed in a manner to not only benefit the inventor, but also the patenting nation and society as a whole. Social benefit is manifested

⁸ See Jean Olson Lanjouw, "Patent Protection: Of What Value and for How Long?" (1998) 65 *The Review of Economic Studies* 671 (suggesting that patent protection may be considered an "implicit subsidy" to R&D since, like a direct subsidy, it increases the expected return from an investment in R&D).

⁹ However, Prof. Bessen of Boston University's law school argues that the marginal incentive provided by a patent is progressively decreasing with soaring patent litigation costs; see Michael Fitzgerald, "A Patent Is Worth Having, Right? Well, Maybe Not", *The New York Times* (15 July 2007), online: *The New York Times* <<http://www.nytimes.com/2007/07/15/business/yourmoney/15proto.html?ex=1342152000&en=17ab981b1b3cf1dd&ei=5090>>.

¹⁰ Federal Trade Commission, *supra* note 2, Ch. 2, "The Role of Competition and the Patent System in Spurring Innovation" at 5; see also Cohen, Nelson & Walsh, *supra* note 4.

in the form of a disclosure requirement, in addition to other economic benefits, arising from commercialization of the patented technology.¹¹ Under the disclosure obligation, the inventor is required to submit as part of the patent application, the detailed specifications necessary to construct the invention. These details are to be kept secret by the Patent Office for a limited period of time, after which they are disclosed to the public.¹² At a general level, the disclosure condition serves as society's trade-off for the monopolistic protection that it affords the inventor against potential competition.¹³ More importantly, it enables the public to acquire the knowledge embodied in the patent and to build upon that knowledge, thus fostering further research and development in the hope of generating innovative technologies.

Present-day patent policy is predominantly nationally based.¹⁴ Each country is entitled to establish its own particular policies, regardless of the patent policies of other states, subject to any international accords to which the country may be a member. In having a patent regime and defining the exclusive rights granted to the patentee, each country considers the benefits to itself, rather than to other countries. Nevertheless,

¹¹ However, a patent holder is not obligated to commercialize the patented invention.

¹² The specifics of the disclosure process may vary among patent regimes, but in essence, the rationale behind the disclosure process is the same – to contribute creativity to the accumulated wealth of social knowledge.

¹³ This trade-off has been traditionally treated as a social contract. However, Ghosh has argued that it would be preferable to approach patent law as a “scheme of market regulation” rather than providing a *quid pro quo* between patent rights and disclosure. See Shubha Ghosh, “Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor after Eldred” (2004) 19 Berkeley Tech. L.J. 1315; and Shubha Ghosh, “Patent Law and the Assurance Game: Refitting Intellectual Property in the Box of Regulation” (2005) 18 Can. J.L. & Juris. 307.

¹⁴ A few international patent schemes exist including the *European Patent Convention* [EPC] and the *Patent Cooperation Treaty* [PCT]; however, both schemes are only international on their face since neither result in a multi-national patent. Specifically, the EPC allows for a centralized patent application procedure for all of its member nations. Once granted, a European patent reverts to a bundle of national rights for each member state, save for a centralized opposition procedure. The PCT instituted a multi-national unified patent filing system resulting in a considerable reduction in both formalities and cost to the applicant. But, the actual granting of the patent in each designated country is the responsibility of the nation's own patent office. International patent schemes will be discussed in further detail in Chapter 4.

domestic patent policy is subject to the influence of foreign schemes and the relative weight of foreign-owned patents obtained in the domestic jurisdiction.¹⁵ A local inventor is free to patent, or not, in the domestic jurisdiction, as well as to seek, in addition, the rewards offered by other patent jurisdictions by patenting in them.¹⁶ In the absence of treaties, countries are also free to offer a patenting mechanism or not¹⁷ and, if they do, to specify the nature and extent of these benefits. In recent decades, globalization has reduced the economic benefits from a domestic patent since it can be rapidly copied in other countries and production based on it can be undertaken in foreign countries as easily as in the domestic jurisdiction.¹⁸ These benefits become even less if the products that use the patent can be legally exported to the original patenting jurisdiction. This reduction in economic benefits to the patentee strikes at the various rationales for granting patents, since the decrease in benefits is likely to reduce the incentives to pursue research and development.

In these respects, the continuing and harmonious existence of national (and international) patent regimes is essential to both technological development, by virtue of the inventions created, and social development, manifested in the integration and exploitation of these new technologies in the community. Consequently, any extensions, limitations, or changes to the patent system must be careful to avoid compromising the

¹⁵ The national patent schemes of some countries are overwhelmed with U.S. applicants.

¹⁶ An invention may be ineligible for patent protection due to, *inter alia*, (1) novelty requirements, such that disclosure in one nation is sufficient to preclude patent protection in another; or (2) asymmetrical subject matter requirements such that what may qualify as an invention eligible for patent protection in one society may not in another.

¹⁷ In fact, some countries find that they can derive greater benefits from not having a patenting system.

¹⁸ See Phillip McCalman, "National Patents, Innovation and International Agreements" (2002) 11:1 The Journal of International Trade & Economic Development 1 (supporting the international coordination of patent policy on the basis that a free-riding incentive and the international spillovers from an innovation render patenting on a national basis inefficient from a global perspective).

balance between national patent regimes. It is suggested that the unilateral imposition of one nation's patent policy upon another would compromise this balance and negatively affect international patent law as a whole. Instead, it is proposed that nations pursue their economic interests through a more cooperative approach, such as by bilateral and multilateral agreement.

3. The early period: the relevant provisions of the U.S. Constitution & the presumption against extraterritoriality

The foundation of American intellectual property policy was constitutionally entrenched in the U.S. Constitution in 1787, empowering Congress “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.”¹⁹ These few lines of text have guided both the U.S. legislature and the judiciary with respect to the intended scope and limitations of domestic copyright, trade-mark, and patent policy. However, the vague wording²⁰ of the entrenchment renders it difficult to argue for or against the existence of an indisputable territorial restriction. Nevertheless, early Constitutional interpretations, the nature of the patent system, and principles of international law justify the existence of an overriding presumption against the extraterritorial extension of domestic patent rights.

¹⁹ U.S. Const. art. I, § 8 cl. 8.

²⁰ Since it is difficult to bring about changes in the Constitution, the vagueness of the above entrenchment in the Constitution can turn out to be useful when there are shifts in the nation's interests on the matter. Chapter 1 had argued that the interests of the United States on extraterritoriality of patents have shifted: at a time when it generated relatively fewer patents than some other countries, it was to its economic benefit not to recognise such extraterritoriality. However, in the last century, it generated relatively far more patents than any other country, so it was to its economic benefit to become in favour of advocating extraterritoriality.

Congress was also empowered to “make all Laws which shall be necessary and proper for carrying into Execution the foregoing Powers.”²¹ One possible interpretation of this empowerment would be a wide one and entail extending the effect of domestic law beyond domestic borders in order to secure the protection of domestic rights. The alternative interpretation would be against such an extension, especially since such an extension to other jurisdictions would mean treading on other countries' sovereignty, as well as raising problems of enforceability in foreign jurisdictions.

In line with the second interpretation, the Supreme Court in *Brown v. Duchesne* imputed a clear domestic limitation on Congress' power to regulate intellectual property:

The power [...] granted is domestic in its character, and necessarily confined within the limits of the United States. It confers no power on Congress to regulate commerce, or the vehicles of commerce, which belong to a foreign nation, and occasionally visit our ports in their commercial pursuits. That power and the treaty-making power of the General Government are separate and distinct powers from the one of which we are now speaking, and are granted by separate and different clauses, and are in no degree connected with it. And when Congress are legislating to protect authors and inventors, their attention is necessarily attracted to the authority under which they are acting, and it ought not lightly to be presumed that they intended to go beyond it, and exercise another and distinct power, conferred on them for a different purpose.²²

In its decision, the Court stressed that U.S. patent laws were intended to carry out the power delegated to Congress, and were thus to be imputed with the same territorial limitations as those conferred upon Congress to pass laws. In particular, the court noted the following:

But these acts of Congress do not, and were not intended to, operate beyond the limits of the United States; and as the patentee's right of property and exclusive use is derived from them, they cannot extend beyond the limits to which the law itself is confined. And

²¹ U.S. Const. art. I, § 8 cl. 8.

²² *Brown v. Duchesne*, 60 U.S. 183, 19 How. 183 at 195 (1856) [*Brown* cited to U.S.]. In *Brown*, the Supreme Court had to determine whether domestic patent law could be applied to potentially infringing equipment on a foreign vessel in domestic waters.

the use of it outside of the jurisdiction of the United States is not an infringement of his rights, and he has no claim to any compensation for the profit or advantage the party may derive from it.²³

Importantly, not only was the patent construct to be geographically confined, but so were the underlying economic incentives.

The definition of the patent grant plays an important role in determining the inherent territorial limitation of the grant. Specifically, patent laws are intended to "secure to the inventor a just remuneration from those who derive a profit or advantage, *within the United States*, from his genius and mental labors."²⁴ The latter objective is accomplished through the grant of exclusive rights to the patentee for a limited duration. The temporary monopoly established by these designated rights is, by definition, premised on the idea that no other rights may impinge on the monopoly. However, the extraterritorial extension of such a monopoly into another jurisdiction with a similar system of patent grant results in somewhat of an incongruity. It would be quite impossible to reconcile overlapping exclusive rights, distinct in their grant, but alike in their object. Any reconciliation would defeat the defining "exclusive" nature of the patent grant, for multiple monopolies cannot coexist and still maintain their exclusive quality.

The inevitable incongruity behind the application of patent law extraterritorially may be recharacterized in terms of competition. In a territorially-limited patent jurisdiction, by coming into competition with the patent holder, one is deemed to have trespassed upon and diminished the value of the patent holder's intellectual property.²⁵ Technical damage is presumed, even if no actual damage was sustained by the patent

²³ *Ibid.* at 195-96.

²⁴ *Ibid.* at 195 [emphasis added].

²⁵ *Ibid.* at 196.

holder or no advantage was gained by the infringer. In applying these precepts to a jurisdiction with competing patent systems (domestic and foreign), a vicious circle emerges. Each competing patent holder would be deemed to have infringed upon the “exclusive” rights of the other, simultaneously. This is the chaotic consequence of extending one patent system beyond jurisdictional borders into those of another patent regime.

Further strengthening the presumption against extraterritoriality is the notion that a nation should be entitled to regulate commerce and patent rights over its own territory without being thwarted by the extrajurisdictional policies of other countries. Patent policy can play a great role since it can encourage domestic inventors to bring their ideas to the market. Encroaching applications of foreign law diminish a government’s ability to effectively employ patent policy to advance its economic policy. Specifically, such encroachments may impact the size and geographic scope of the competitive markets of a particular invention. For example, assume that a patent holder in Country A is able to enforce his patent in relation to activities occurring in Country B. Further, assume that the invention remains unpatented in Country B. The ability of Country A to enforce its patents extraterritorially will influence the dynamic of economic competition in both countries. First, the patent holders in Country A will have their monopoly enlarged, and thus will gain control of a greater market. Second, the competitors of Country A, who were originally free to exploit the invention within the boundaries of Country B due to the lack of a patent monopoly, will see their competitive territory shrunken. Third, competitors of Country B, who may or may not be willing to recognize the authority of Country A’s extraterritorial assumption of jurisdiction, may see a portion of their

potential market lost to the foreign patent holder. Each of these consequences could affect the respective nation's economy, and as such, could result in the varying patent regimes vying for economic and legal control over the same invention. Thus, in order to maintain discrete economic control, the territorial delimitation of domestic patent rights should extend only as far as the scope of the domestic territory.²⁶

As argued in Chapter 1, patentees have an economic interest in extending the application of their patent rights over as wide an area as possible. Nevertheless, the courts with justifiable legal reasons, as argued earlier, limit the application of patent rights domestically. Notably, if two countries were to grant patents to two different patentees (one in each country) covering the same subject-matter, and both were to allow the extraterritorial extension of its laws to the other country, there would be conflict and confusion among the rights of the patentees and neither would acquire even in their own country the monopoly rights that their patents would seek to confer on them. Chapter 3 will reevaluate this presumption against extraterritoriality in the context of the emerging trends of globalization and the change in the nature of information over the last few decades.

3.1. Limiting the scope of patent rights in Brown v. Duchesne

The above discussion applies to products wholly produced and sold outside the jurisdiction of the patentee's country, without entering its jurisdiction for sale or use. This section examines the territorially restricted scope of U.S. patent rights, as illustrated by

²⁶ Donald S. Chisum, "Normative and Empirical Territoriality in Intellectual Property: Lessons from Patent Law", Comment, (1997) 37 Va. J. Int'l L. 603 at 608 (suggests that the scope of a patent should match the territorial market of the country issuing the patent).

the patentee's rights to limit the sale or use of foreign manufactured products in the domestic jurisdiction.

A narrow interpretation of the patentee's rights was held by the United States Supreme Court in *Brown v. Duchesne* on whether ships which embodied a component patented in the United States could enter its waters without violating the patentee's rights. In the court's view, the patentee's rights came into conflict with the power granted to Congress by the Constitution to legislate on international commerce:

This view of the subject, however, presupposes that the patent laws embrace improvements on foreign ships, lawfully made in their own country, which have been patented here. But that is the question in controversy. And the court is of opinion that cases of that kind were not in the contemplation of Congress in enacting the patent laws, and cannot, upon any sound construction, be regarded as embraced in them. For such a construction would be inconsistent with the principles that lie at the foundation of these laws; and instead of conferring legal rights on the inventor, in order to do equal justice between him and those who profit by his invention, they would confer a power to exact damages where no real damage had been sustained, and would moreover seriously embarrass the commerce of the country with foreign nations. We think these laws ought to be construed in the spirit in which they were made—that is, as founded in justice—and should not be strained by technical constructions to reach cases which Congress evidently could not have contemplated, without departing from the principle upon which they were legislating, and going far beyond the object they intended to accomplish. [...] The construction claimed by the plaintiff would confer on patentees not only rights of property, but also political power, and enable them to embarrass the treaty-making power in its negotiations with foreign nations, and also to interfere with the legislation of Congress when exercising its constitutional power to regulate commerce.²⁷

This limitation on patent rights in *Brown v. Duchesne* seems to have been determined by the court's interpretation of the rights of Congress versus those of the patentee, rather than of questions related to the inconsistency involved in the conferment or recognition of overlapping monopoly rights. Notably, the Court's narrow interpretation of the scope of patent rights was rooted in the paramountcy of Congress' right to legislate on foreign trade and intercourse over the individual's patent power.

²⁷ *Brown*, *supra* note 22 at 196-97.

Brown v. Duchesne clearly recognized the rights of the patentee as those of his private property in stating “by the laws of the United States, the rights of a party under a patent are his private property; and by the Constitution of the United States, private property cannot be taken for public use without just compensation.”²⁸ However, the Court’s decision was based on its recognition of the rights of Congress, as reflected in the following excerpt:

And in the case I have stated, the Government would be unable to carry into effect its treaty stipulations without the consent of the patentee, unless it resorted to its right of eminent domain, and went through the tedious and expensive process of condemning so much of the right of property of the patentee as related to foreign vessels, and paying him such a compensation therefor as should be awarded to him by the proper tribunal. The same difficulty would exist in executing a law of Congress in relation to foreign ships and vessels trading to this country. And it is impossible to suppose that Congress in passing these laws could have intended to confer on the patentee a right of private property, which would in effect enable him to exercise political power, and which the Government would be obliged to regain by purchase, or by the power of its eminent domain, before it could fully and freely exercise the great power of regulating commerce, in which the whole nation has an interest. The patent laws were passed to accomplish a different purpose, and with an eye to a different object; and the right to interfere in foreign intercourse, or with foreign ships visiting our ports, was evidently not in the mind of the Legislature, nor intended to be granted to the patentee.²⁹

By contra-argument, Congress could not have intended its laws to have extraterritorial effect since to do so would have granted patent holders an undue political power that could affect treaty-making processes:

Yet it may perhaps be doubted whether Congress could by law confer on an individual, or individuals, a right which would in any degree impair the constitutional powers of the legislative or executive departments of the Government, or which might put it in their power to embarrass our commerce and intercourse with foreign nations, or endanger our amicable relations.³⁰

²⁸ *Ibid.* at 197.

²⁹ *Ibid.* at 197-98.

³⁰ *Ibid.* at 198.

Ultimately, the presumption against extraterritoriality prevailed in this pre-modern period of U.S. patent policy. Patent rights did not extend to production based on the patent in other countries and did not block foreign producers from exploiting the U.S.-patented subject-matter. Interestingly, the Constitutional interpretation in *Brown v. Duchesne* further limited the rights of the patentee: patent rights did not even extend to transport vessels that embodied the patented device and entered the territorial jurisdiction of the United States.

4. The modern period: redefining the presumption against extraterritoriality

From the eighteenth to the twentieth centuries, the relative economic power of the United States increased extensively. In the eighteenth and nineteenth centuries, the United States had less industrial production than Britain. But, by the end of the Second World War, it had become the dominant economic power and also generated the largest number of inventions than any other nation in many sectors.³¹ Further, in the late twentieth century, the nature of economic activity shifted to include information technology and other information-based products. Therefore, the interests of the United States had shifted to a much broader scope of the rights of its patentees. As a result, American patent policy has seen consistent aggrandizement in the last twenty years. For instance, the scope of patentable subject-matter had broadened significantly. In an attempt to adapt to a changing standard of invention, from physical product to information-based, the courts extended the scope of patentable subject-matter to include

³¹ See *supra* Ch. 1, note 15.

business method patents.³² The scope was further enlarged to include the patenting of higher life-forms.³³ In addition to extending patent rights via a broadened subject-matter base, the United States has taken measures to broaden the patent monopoly, geographically, as will be examined in depth in the next section.

4.1. Statutory implementations of extraterritoriality: 35 U.S.C. 271

Currently, under the laws of the United States, direct infringement of a patent is protected against under 35 U.S.C. § 271(a):

[W]hoever without authority makes, uses, offers to sell, or sells any patented invention, *within the United States* or imports *into the United States* any patented invention during the term of the patent therefor, infringes the patent.³⁴

A plain reading of the phrase “within the United States”, in the context of the patent statute as a whole, confirms that the situs of infringement is territorially limited to the “United States of America, its territories and possessions.”³⁵ This is further evidenced by the fact that 35 U.S.C. § 154(a)(1), which describes the extent of the patent grant upon which s. 271 is based, specifically limits the patentee’s exclusionary rights to “making, using, offering for sale, or selling the invention *throughout the United States*” and “importing the invention *into the United States*”.³⁶

³² See e.g. *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 47 USPQ.2d 1596 (Fed. Cir. 1998), cert. denied, 525 U.S. 1093, 119 S.Ct. 851, 142 L.Ed.2d 704 (1999).

³³ See e.g. *Diamond v. Chakrabarty*, 447 U.S. 303, 100 S.Ct. 2204, 65 L.Ed.2d 144 (1980); U.S. Patent No. 4,736,866 (issued April 12, 1988) (the “Harvard Mouse”).

³⁴ 35 U.S.C. § 271(a) (2000) [emphasis added].

³⁵ 35 U.S.C. § 100(c) (2000) (“The terms “United States” and “this country” mean the United States of America, its territories and possessions.”); see Chisum, *supra* note 26 at 605 (arguing that “[w]ith such explicit provisions, there is no occasion even to consider whether there is a presumption for or against extraterritorial application”).

³⁶ 35 U.S.C. § 154(a) [emphasis added] (“Every patent shall contain [...] a grant to the patentee [...] of the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States, and, if the invention is a process, of the right to

Protection against the active inducement of infringement and contributory infringement, domestically, are reflected in 35 U.S.C. § 271(b) and (c), respectively.³⁷ The operation of both subsections (b) and (c) is ancillary to a finding of direct infringement under § 271(a), and thus, the provisions assume an element of territorial dependency from subsection (a).³⁸ However, whether by intention or due to the inconsequentiality of extraterritorial issues at the time, neither subsection (b) or (c) was enacted with phrasing that would connote the need for the inducement or contributory activity to occur domestically. Instead, the territorial constraint of the provisions have been interpreted by the courts as only requiring a finding of direct infringement within the United States, but not necessitating the subsidiary action to have also occurred within the United States for a finding of indirect infringement.³⁹ American courts have extended the doctrine of contributory infringement so far as to hold liable foreign manufacturers of U.S.-patented products that were later introduced and resold in domestic markets within

exclude others from using, offering for sale or selling throughout the United States, or importing into the United States, products made by that process [....]”).

³⁷ 35 U.S.C. § 271(b) (2000) (“Whoever actively induces infringement of a patent shall be liable as an infringer.”), § 271(c) (2000) (“Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.”).

³⁸ See *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 81 S.Ct. 599 (1961) [cited to U.S.] at 341 (“if there is no direct infringement of a patent there can be no contributory infringement”). The nature of this dependency will be discussed in further detail below in “The ‘Substantial’ Double Standard” section.

³⁹ See Denise W. DeFranco & Adrienne N. Smith, “Technology and the Global Economy: Progress Challenges the Federal Circuit to Define the Extraterritorial Scope of U.S. Patent Law” (Fall 2006) 34 A.I.P.L.A. Q.J. 373 at 385-87, 386 note 85; see *MEMC Elec. Materials Inc. v. Mitsubishi Materials Silicon Corp.*, 420 F.3d 1369, 76 U.S.P.Q.2d 1276 (Fed. Cir. 2005) (the occurrence of the inducing activity outside the United States did not preclude a trial to determine whether the defendant induced infringement of a U.S. patent); see *Nippon Elec. Glass Co., Ltd. v. Sheldon*, 489 F.Supp. 119, 209 U.S.P.Q. 1023 [cited to F.Supp.] at 122 (“Unlike direct infringement, which must take place within the United States, 35 U.S.C. s 271(a), contributory infringement under 35 U.S.C. s 271(b) or (c), does not require any activity by the contributory infringer in this country, as long as the direct infringement occurs here.”)

the knowledge and contemplation of the manufacturers.⁴⁰ Curiously, while contributory infringement saw the eventual addition of the territorially limiting phrase “within the United States”,⁴¹ the geographic scope of active inducement has remained unrestricted since the enactment of subsection (b). The lack of explicit territorial limitation to a finding of active inducement, in light of such plainly limiting phrasing in subsections (a) and (c), may suggest that the foreign sale of components may still be captured under domestic law as unlawful inducement.⁴²

Before November 8, 1984, when 35 U.S.C. 271(f) was enacted, the scope of active inducement of infringement and contributory infringement of an invention patented in the U.S. were still territorially limited to U.S. borders in that they first required a finding of direct infringement, domestically. At the time, unauthorized manufacturers were able to avoid patent infringement by exporting an invention's unassembled components and reassembling them outside the United States.⁴³ By exporting the components, the acts of "making" and "using" the invention were no longer occurring domestically, and therefore no longer subject to domestic patent law. This issue was brought to the forefront of American law in 1972 in the United States Supreme

⁴⁰ *Engineered Sports Products v. Brunswick Corp.*, 362 F.Supp. 722, 179 U.S.P.Q. 486 (D. Utah 1973) [cited to F.Supp.] (jurisdiction assumed over an act of foreign manufacturer by virtue of a quasi-agency relationship tying the foreign manufacturer to domestic sales of infringing product), cited in Chisum, *supra* note 26 at 615.

⁴¹ *Uruguay Round Agreements Act*, Pub. L. 103-465, § 533(a)(2), 108 Stat. 4809 (1994), enacted pursuant to harmonization obligations under the *Agreement on Trade-Related Aspects of Intellectual Property Rights*, Annex 1C to *The Final Act and Agreement Establishing the World Trade Organization*, 15 April 1994, 33 I.L.M. 81, online: World Trade Organization <http://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm> [*TRIPS Agreement*].

⁴² Chisum, *supra* note 26 at 616.

⁴³ See *Eolas Techs. v. Microsoft Corp.*, 399 F.3d 1325, 73 U.S.P.Q.2d 1782 (Fed. Cir. (Ill.) 2005) [*Eolas* cited to F.3d] at 1340, leave to appeal to U.S. refused, 126 S. Ct. 568, 163 L. Ed. 2d 499 (October 31, 2005).

Court's decision in *Deepsouth Packing Co. v. Laitram Corp.*⁴⁴ In *Deepsouth*, the defendant manufacturer wished to export machinery used for deveining shrimp. While the defendant was barred from using, making, or selling the machinery within the United States due to an existing combination patent, it was exporting complete, but unassembled, deveiners for reassembly and use abroad. In rendering its decision, the Court applied a strict view of the limitations of the original patent grant. To enforce the patent rights based on foreign assembly for foreign markets would be to expand the patent rights beyond those originally granted.⁴⁵ Accordingly, the Court held that before contributory infringement could be found (i.e., the sale of the unassembled components of a patented invention for reassembly abroad), direct infringement by the competitor in the United States would have to be shown.⁴⁶ But, a combination patent only protected against the domestic assembly of the whole invention, and not simply the manufacture of its constituent parts.⁴⁷ Since the patented invention was only being assembled once it was outside the United States, no direct infringement could be found either. Consequently, the Court held for the defendant manufacturer.

Writing for the majority, Justice White directly addressed the notion of extraterritoriality, noting that United States patents were not intended to have extraterritorial effect:

⁴⁴ *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 92 S.Ct. 1700, 32 L.Ed.2d 273 (1972) [*Deepsouth* cited to U.S.], rev'g 443 F.2d 936, 170 U.S.P.Q. 196 (5th Cir. (La.) 1971) [*Deepsouth* (5th Cir.) cited to F.2d].

⁴⁵ *Ibid.* at 530-31.

⁴⁶ *Ibid.* at 526-27.

⁴⁷ The territorial limitation of the doctrine of contributory infringement to domestic borders and the related notion that a combination patent was not infringed until *all* elements were assembled in operable form was considered accepted doctrine at the time of *Deepsouth*. See *Hewitt-Robins, Inc. v. Link-Belt Co.*, 371 F.2d 225 (7th Cir. 1966); *Cold Metal Process Co. v. United Engineering & Foundry Co.*, 235 F.2d 224 (3rd Cir. 1956); *Radio Corp. of America v. Andrea*, 79 F.2d 626 (2nd Cir. 1935).

In conclusion, we note that what is at stake here is the right of American companies to compete with an American patent holder in foreign markets. Our patent system makes no claim to extraterritorial effect; ‘these acts of Congress do not, and were not intended to, operate beyond the limits of the United States,’ *Brown v. Duchesne* [...] (1856), and we correspondingly reject the claims of others to such control over our markets. Cf. *Boesch v. Graff* [...] (1890). To the degree that the inventor needs protection in markets other than those of this country, the wording of 35 U.S.C. ss 154 and 271 reveals a congressional intent to have him seek it abroad through patents secured in countries where his goods are being used.⁴⁸

Consequently, the majority refused to impute U.S. patent laws with an extraterritorial reach to regulate foreign-based activities without a clear congressional indication to do so.⁴⁹

The decision was not rendered without controversy among the court members themselves. Four of the nine justices dissented, adopting a broader interpretation of “making” under ss. 154 and 271(a), the provisions setting forth the contents of the patent grant and the conditions for liability for direct infringement, respectively. Writing for the dissent, Justice Blackmun concurred with the opinion of the Fifth Circuit and cited Judge Clark’s ominous forecast in the lower court ruling:

If this Constitutional protection is to be fully effectuated, it must extend to an infringer who manufactures in the United States and then captures the foreign markets from the patentee. The Constitutional mandate cannot be limited to just manufacturing and selling within the United States. The infringer would then be allowed to reap the fruits of the American economy – technology, labor, materials, etc. – but would not be subject to the responsibilities of the American patent laws. We cannot permit an infringer to enjoy these benefits and then be allowed to strip away a portion of the patentee’s protection.⁵⁰

⁴⁸ *Deepsouth*, *supra* note 44 at 531 [citations omitted].

⁴⁹ *Ibid.* at 531-32.

⁵⁰ *Ibid.* at 534, citing 443 F.2d 936 at 939. The dissenting members of the Court were particularly displeased by the fact that *Deepsouth* was exporting the unassembled patented machine in three separate boxes, completely assemblable in less than one hour. Further, *Deepsouth* straightforwardly admitted that its operations were designed to side-step infringement under U.S. patent laws. *Deepsouth*, *supra* note 44 at 524, 533.

Owing to what was perceived as an overly narrow interpretation of U.S. patent law in *Deepsouth*, the Supreme Court was criticized for effectively creating a loophole that would allow unauthorized manufacturers to exploit U.S. patented creativity without fear of liability for contributory infringement or active inducement to infringe. The worry was that the ruling would open the gates to even more manufacturers to relocate their assembly operations outside the United States in an effort to avoid the expense of having to license patented technologies.

In response to *Deepsouth*, Congress closed the foreign assembly loophole with the 1984 enactment of 35 U.S.C. 271(f).⁵¹ Section 271(f) reads as follows:

(1) Whoever without authority supplies or causes to be supplied in or from the United States *all or a substantial portion of the components* of a patented invention, where such components are uncombined in whole or in part, in such manner as to actively induce the combination of such components outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.

(2) Whoever without authority supplies or causes to be supplied in or from the United States *any component* of a patented invention that is especially made or especially adapted for use in the invention and not a staple article or commodity of commerce suitable for substantial noninfringing use, where such component is uncombined in whole or in part, knowing that such component is so made or adapted and intending that such component will be combined outside of the United States in a manner that would infringe the patent if such combination occurred within the United States, shall be liable as an infringer.⁵²

The provision reflects similar protections as those afforded against active inducement and contributory infringement as under s. 271(b) and (c), except in relation to foreign rather than domestic acts. The speculative phrase, “if such combination occurred within the

⁵¹ *Rotec Indus., Inc. v. Mitsubishi Corp.*, 215 F.3d 1246 at 1252, note 2 (Fed. Cir. (Ill.) 2000) [*Rotec*]; *Patent Law Amendments Act of 1984*, Pub. L. No. 98-622, § 106(c), 98 Stat. 3383 (1984) (enacting 35 U.S.C. § 271(f)). Interestingly, the original bill that proposed s. 271(f) was amended by the U.S. Senate, “deleting the language which would have extended process patent protection to products produced by the patented process overseas,” U.S., S. Amdt. 7102, 98th Cong., 1984.

⁵² 35 U.S.C. § 271(f) (2000) [emphasis added].

United States,” could equivalently be replaced by “if domestic patent law were applicable in the jurisdiction where the combination took place.” Section 271(f) effectively extends the reach of patent law beyond the territorial borders to which domestic laws, including patent laws, were originally restricted.

There are some important differences between the protections afforded against foreign acts of infringement under s. 271(f) and those available against domestic violations under paragraphs (b) and (c). The extraterritorial protections of section 271(f) are narrower than its domestic counterparts'. Paragraph (f)(1) imposes an additional requirement that at least “a substantial portion of the components” be supplied from the United States. This excludes the possibility of being liable for active inducement to infringe by simply providing expertise or instructions, both of which might qualify under paragraph (b).⁵³ Also, paragraph (f)(2) refers to “any component of a patented invention” whereas paragraph (c) allows for a broader range of infringement triggers, including “a component [...] or a material or apparatus for use in practicing a patented process.”⁵⁴

4.2. The “substantial” double standard

Section 271(f) removes the dependency on direct infringement for active inducement or contributory infringement to apply to the transborder supply of components. Domestically, a finding of infringement under paragraphs (b) or (c) is conditional on first finding direct infringement under paragraph (a). In contrast, section 271(f) creates independent grounds for infringement. Proof of foreign assembly of the patented invention need not be shown. Both paragraph (f)(1) and (f)(2) contemplate the

⁵³ 35 U.S.C. § 271(b) (“Whoever actively induces infringement of a patent shall be liable as an infringer.”).

⁵⁴ R. Carl Moy, *Moy's Walker on Patents*, 4th ed. (N.p.: Thomson West, 2003) Part III, § 12:29 (WLeC).

scenario where components are supplied from the United States with the intention that they will ultimately be combined to form an invention that would infringe a U.S. patent if the combination occurred within the United States, even should the combination never occur. Proof of direct infringement (of the complete invention), were it needed, would impose a high barrier to a finding of infringement under s. 271(f), especially in light of a U.S. court's lack of jurisdiction, and thus an absence of investigative and discovery powers in the foreign jurisdiction.⁵⁵

The judiciary has consistently held that direct infringement under s. 271(a) requires that *all* components set out in the patent claim must be present in the infringing copy. The courts have been clear and consistent in their assertion that mere “substantial” infringement, but not complete infringement, is insufficient to constitute direct infringement. The Court of Appeals in *Deepsouth* interpreted the term “makes” in the context of infringement as connoting “substantial manufacture of the constituent parts of the machine.”⁵⁶ Yet, the Supreme Court overturned the ruling, finding “the Fifth Circuit's definition unacceptable because it collides head on with a line of decisions so firmly embedded in our patent law as to be unassailable absent a congressional recasting of the statute.”⁵⁷ The high standard of proof required to establish direct infringement under s. 271(a) imposes an even higher standard for one to establish active inducement or contributory infringement as both the latter secondary grounds are dependent on first establishing contravention of the former. Even though a finding of contributory infringement under paragraph (c) only requires that the supplied component constitute “a

⁵⁵ See *Waymark Corp. v. Porta Systems Corp.*, 245 F.3d 1364 (Fed. Cir. 2001) at 1367-69 (removing direct infringement as a prerequisite for contributory infringement under s. 271(f)(2)).

⁵⁶ *Deepsouth* (5th Cir.), *supra* note 44 at 938-39.

⁵⁷ *Deepsouth*, *supra* note 44 at 528.

material part of the invention,” one would first have to establish that the infringing invention includes each and every component set out in the patent claim.

Section 271(f) seems to extend the scope of patent protection not only geographically, but also in breadth. The provision only requires that a “substantial portion” of the components be supplied in order to attract liability. The provision is directed at capturing instances of active inducement and contributory infringement. Accordingly, it is not intended to be an analogue of paragraph (a), but rather one of paragraphs (b) and (c). Yet, the “substantial portion” standard of paragraph (f) is notably lower than that of paragraphs (b) and (c), as established above. This is primarily due to the fact that s. 271(f) is its own cause of action and its application is not dependent on a finding of direct infringement under paragraph (a).⁵⁸ The inconsistent standards of proof were alluded to by the Court of Appeals for the Federal Circuit in *Rotec Indus., Inc. v. Mitsubishi Corp.*:

§ 271(f) does not, however, change the nature of § 271(a) liability, as it provides a separate cause of action. Hence, as to claims brought under § 271(a), *Deepsouth* remains good law: one may not be held liable under § 271(a) for “making” or “selling” less than a complete invention.⁵⁹

Thus, U.S. patent law imposes stricter standards of proof domestically than it does extraterritorially. This constitutes a subtle impingement on the presumption against extraterritoriality as it not only allows for domestic regulation to influence activities

⁵⁸ Subsection § 271(f) is further distinguished from § 271(a) in that its scope does not mirror recent broadenings of (a), including the addition of an “offer to sell” as a triggering factor for infringement (see *infra* Ch. 3, note 26.). Specifically, the Court in *Rotec* noted that § 271(f)(2) did not extend so far as to cover an “offer to supply” a component of a patented invention. *Rotec*, *supra* note 51 at 1257-58. Contrary to the majority view in *Rotec*, Newman J., writing for the minority, believed that despite §271 (a) and (f) constituting independent actionable grounds, subsection (f) should not be read in isolation, but rather in harmony with (a). *Rotec*, *supra* note 51 at 1260-61.

⁵⁹ *Rotec*, *supra* note 51 at 1252, note 2.

intended to occur in a foreign jurisdiction (e.g., assembly of the U.S.-patented invention), but lowers the barrier for such regulation to take place.

Further, Congress' enactment of s. 271(f) extends beyond the scenario the provision was intended to prevent (i.e., that of *Deepsouth*). In *Deepsouth*, the defendant had exported *all* the components necessary to construct the patented invention. Yet, s. 271(f)(1) refers to the export of "all *or a substantial portion* of the components", while s. 271(f)(2) requires the export of a sole component in order to infringe the patent.⁶⁰ Section 271(f) represents an overbearing response to extraterritorial instances of "infringement": if other jurisdictions were to adopt such a provision, there would be conflict and confusion in cases of products that simultaneously include patented components from several jurisdictions.⁶¹

4.3. Importation Law

The intangible nature of process inventions, and conceivably of their resulting issue, brings into question the applicability of importation law to the patented subject-matter. Section 271(g) prohibits unauthorized importation into the United States as well as offers to sell, sales, or uses within the United States of a product made by a process patented in the United States, so long as the infringing act occurs during the term of the patent.⁶² As with s. 271(f), infringement under subsection (g) regulates a combination of foreign conduct (i.e., the performance of the patented process) and domestic activity (e.g.,

⁶⁰ *AT&T Corp. v. Microsoft Corp.*, 127 S. Ct. 1746, 75 U.S.L.W. 4307 (2007) [*AT&T* cited to S. Ct.] at 1760, note 18, rev'g 414 F.3d 1366, 75 U.S.P.Q.2d 1506 (Fed. Cir. (N.Y.) 2005) [*AT&T (Fed. Cir.)* cited to F.3d], rev'g 2004 W.L. 406640, 71 U.S.P.Q.2d 1118 (S.D.N.Y. 2004).

⁶¹ It has also been argued that the provision's coverage is asymmetric between structural combinations and processes: whilst this provision prohibits the export of components of physical patented inventions, it does not cover the export of components for use in a patented process. Chisum, *supra* note 26 at 607.

⁶² 35 U.S.C. § 271(g) (2000),

unauthorized importation into or use within the United States), giving the provision its extraterritorial character.

Importantly, while external practice of a U.S.-patented process will attract liability if the product is imported into the United States, external practice of the process alone will not attract liability. This is the distinction with which foreign manufacturers are faced when selecting methods of production abroad. It is one thing to regulate the scenario where a manufacturer assembles components outside the U.S. of a product subject to a U.S. patent in order to re-import the finished product. Such a scenario is covered under the "importation" facet of direct infringement under s. 271(a). Further, this type of prohibition unquestionably falls within the jurisdiction of domestic patent laws as it predominantly regulates an activity occurring locally (i.e., the import and sale of a product subject to a U.S. patent within U.S. borders). It is quite a different thing to influence the use of production techniques outside one's borders as is ultimately accomplished by s. 271(g). The provision eliminates the possibility, the world-over, for one to employ a process patented in the U.S., whether or not it has been patented in the country of use, in the hopes of selling the resulting product on the U.S. market. The possibility of being denied access to one of the world's largest markets is likely to influence the production method used, providing the U.S. with effective economic control well outside its jurisdiction.

The extraterritorial reach of s. 271(g) has its limitations. Material alterations by subsequent processes and integration as a nonessential component of a greater product will exempt the process product from liability under the provision.⁶³ The domestic

⁶³ 35 U.S.C. §271(g).

purchase and export of apparatus to be used in the patented process will not constitute contributory infringement so long as it is not subject to patent protection.⁶⁴ Further, the section only applies to physical products imported into the U.S., and not to intangibles such as information.⁶⁵ This latter limitation is important, since, otherwise, it could hamper the flow of information through American networks (e.g., Internet traffic), ultimately denying American consumers the benefit of accessing foreign information services.⁶⁶

4.4. Implications of the extraterritorial nature of s. 271

The extension of U.S. patent policy via the regulation of the supply and import of components and products under ss. 271(f) and (g) indirectly, and in some circumstances virtually directly, affects activities occurring in foreign jurisdictions and can infringe on the sovereignty of those nations. Such an extension of U.S. patent rights violates the long-held presumption against extraterritoriality and the underlying arguments behind that presumption. In addition to contravening the Constitutional authority behind the presumption, regulating activities extraterritorially impacts the sovereignty of other nations, inviting retaliation from them in the form of similar extensions by them to the U.S. jurisdiction, and raises problems of enforcement in the foreign jurisdictions. Further, such policies are bound to create disparity among the relative bargaining positions of

⁶⁴ *Standard Havens Products, Inc. v. Gencor Industries, Inc.*, 953 F.2d 1360 (Fed. Cir. 1991) at 1374.

⁶⁵ *Bayer AG v. Housey Pharmaceuticals, Inc.*, 340 F.3d 1367, 68 U.S.P.Q.2d 1001 (Fed. Cir. (Del.) 2003) [cited to F.3d].

⁶⁶ For example, the creation, processing, and transport of digital information may be the result of a number of patented processes and could thus fall subject to the application of s. 271(g) were it not for the aforementioned judicial exemption.

nations and their patent regimes, impairing future efforts at coordinating patent law internationally.

5. Summary

The U.S. patent system is rooted in the powers bestowed upon Congress by the U.S. Constitution. At the time of the Constitution's formation, the need to extend American patent laws extraterritorially was a remote consideration in light of the nation's weak economic position. Further, the scope of the patent power was vaguely defined by the Constitution, leaving the courts to elaborate the extent of the power. The courts interpreted the scope of patent rights in such a way as to restrict their extraterritorial application, such that patent rights did not apply to production and sale of goods in other jurisdictions. The courts in *Brown v. Duchesne* in 1856 further held that domestic patent laws did not apply to ships built in other jurisdictions, even though they had entered the territorial waters of the United States. This interpretation was based not directly on the nature of patent rights but on the rights of patentees versus the rights of Congress to regulate commerce. This interpretation established early in U.S. history a judicial presumption against any extraterritorial extension of patents.

The interests of the United States shifted considerably since then, and by the mid-twentieth century, with extensive flows of knowledge among countries and extensive trade, the limited interpretation of the rights of patentees had severely restricted the extent of the monopoly rights granted to patentees. This was reflected in the landmark decision in *Deepsouth* which allowed manufacturers to plainly subvert domestic patent rights by

exploiting a technical deficiency in the patent grant, legitimizing the unauthorized export of components of a patented product in unassembled form.

It was, therefore, left to Congress to re-specify in new legislation the rights that U.S. patent holders should have in the modern era of increasing globalization, with instant communications, low transport costs, and multinational corporations with production and sales spread in very many countries. This redefinition of patent rights occurred in the 1984 enactment of 35 U.S.C. 271(f). This legislation extended the scope of patent protection geographically, as well as in breadth by requiring only that a “substantial portion” of the components be supplied in order to attract liability, as well as capturing instances of active inducement and contributory infringement. These extensions of patent rights reflected the economic realities of production and sales in the era of globalization better than the case law, as in *Brown v. Duchesne* and *Deepsouth*.

Section 271(f) involves the combination of a domestic activity, the local supply of component parts, and a foreign activity, namely the combination of such parts. The provision was enacted in order to avoid abuse of the patent regime, but the scope of the provision is so large as to legislate against many legitimate forms of export. While the operational legality over the proliferation of exporting component parts of patented inventions abroad was addressed in the United States by the enactment of s. 271(f), issues of economic and moral justification still linger. These issues and others will be explored in an international context in Chapter 4.

Chapter 3 takes the analysis of the two main issues, economic interests and extraterritorial extension of patents, beyond s. 271(f), and beyond *Brown v. Duchesne* and *Deepsouth Packing Co. v. Laitram Corp.* The discussion will also focus on the

evolution in the late twentieth century of patentable materials from manufacturing products and processes to include digital products, as well as on the impact of globalization on economic interests. Given these trends, Chapter 3 develops the thesis that, given support for the legitimacy of the doctrine of the legal presumption against territoriality, countries in the modern digital age with instant communications and low transport costs badly need to ensure the protection of their innovation beyond their borders. This is particularly so for software and information-based inventions, whose particular nature is conducive to transborder exploitation. A significant part of Chapter 3 discusses the problems raised by patenting such products and ensuring a due return to them. Chapter 3 concludes with the view that the increased need for ensuring the application of patents beyond the domestic territory should be accommodated through treaties and multilateral agreements, rather than through attempts at unilateral extensions of domestic patents to foreign jurisdictions.

Chapter 3

Interpretation & Implementation of Extraterritoriality

1. Introduction

Chapter 1 had laid out the economic and legal arguments on the extraterritorial extension of patents. Its basic thesis was that the economic interests of patentees and countries lie in having the application of their domestic patents over as wide an area as possible, while denying foreign patents a similar application in domestic markets. Further, in general, countries that generate substantially more patents than other countries are likely to find it to their economic advantage to support treaties for the mutual extension of patent rights, while those that generate relatively few patents are likely to find it to their economic advantage not to enter into such treaties. The legal considerations support limiting their application to the domestic territory. Chapter 2 had considered the interplay between these economic and legal factors during the eighteenth and nineteenth centuries. Innovations in this period were normally in the form of industrial products and processes. As will be described in this chapter, several new elements relevant to the extraterritoriality debate have emerged over the past few decades. In view of these developments, the pursuit of economic incentives for patents now imply a greater imperative, than in earlier periods, for patentees and nations to extend the protection of their innovation internationally.

The extraterritorial reach of U.S. patent law, while sanctioned by the legislative framework of s. 271, has seen its most significant developments judicially. The need for judicial interpretation is largely due to advancements in technology and, thus, an evolving base of patentable subject-matter. Section 271(f) was designed in an era of predominantly

physical, machine based inventions. In such a context, a plain reading of the provision may have been sufficient to fully capture the intendment behind its enactment. However, fundamental changes in the nature of technology have since rendered it difficult to accurately meet the provision's original objectives. The rising importance of intangible inventions, such as software and information-based process patents, challenges conventional notions of the way innovation can be exported and exploited abroad. Locality of the invention has been divorced from its use such that operation of the invention can straddle territorial boundaries, and hence, patent jurisdictions. A poor understanding of contemporary technologies has led the courts to employ inconsistent approaches towards policing the monopolies granted over these technologies. Between 1999 and 2007, American software developers saw diverging rulings on the applicability of 35 U.S.C. § 271 to instances of foreign infringement, in the context of exported software master disks and the transborder flow of information.

This chapter addresses the judicial environment leading to the extraterritorial application of patent laws in the United States. The aftermath of s. 271(f)'s enactment will be tracked, predominantly through the case analysis of three recent, high-level decisions. Other subsections of s. 271 will also be scrutinized to the extent that they serve extraterritorial means. This chapter provides a comprehensive understanding of U.S. judicial policy towards the application of patent laws extraterritorially. Attention will be drawn to two important aspects expounded by the courts. First, the discussion will assess the non-componential nature of software. Due to the globalizing nature of commerce and the increased accessibility to global information sources, emerging technologies have imposed new challenges on existing policy frameworks. Prior assumptions of physicality

and thus the spatial coexistence of an invention and its use no longer hold true, resulting in new technologies, particularly software, falling through the holes of current legislative schemes. While this chapter will examine software and information-based inventions in detail, this is solely because it is in these realms that the extraterritoriality polemic has arisen (so far) in the case law. Consequently, much of the discussion in this chapter is also applicable to other forms of innovation with similar qualities (e.g., intangibility). Second, through the examination of case law, this chapter will revisit the economic arguments in favour of extending the scope of applicability of patents, especially of software and information-based inventions over as wide an area as possible, as well as the legal presumption against extraterritoriality.¹

2. Case analyses (in chronological order)

2.1. Eolas Techs. v. Microsoft Corp.

In *Eolas Techs. v. Microsoft Corp.*,² the United States Court of Appeals for the Federal Circuit ruled on whether instances of foreign infringement were to be included in the determination of damage awards under 35 U.S.C. § 271(f). In 1999, Eolas sued Microsoft claiming infringement of patented technology in Microsoft's Internet Explorer software. Essentially, Eolas' patent allowed for a web browser to exploit interactive applications (e.g., video clip or Internet-based game) embedded in a "hypermedia

¹ The presumption against extraterritoriality was introduced and discussed in Chapter 2.

² *Eolas Techs. v. Microsoft Corp.*, 399 F.3d 1325, 73 U.S.P.Q.2d 1782 (Fed. Cir. (Ill.) 2005) [*Eolas* cited to F.3d], leave to appeal to U.S. refused, 126 S. Ct. 568, 163 L. Ed. 2d 499 (October 31, 2005).

document" (e.g., a webpage).³ At the district court level, a jury found that Microsoft had directly infringed two patent claims as well as having induced others to infringe.⁴ Most importantly, citing 35 U.S.C. § 271(f), the district court awarded Eolas with royalty damages that reflected foreign sales of the Internet Explorer software in addition to domestic sales.⁵

To understand the issue of foreign infringement of software in the context of s. 271(f), it is important to first understand the process by which domestically developed software is integrated into the foreign-assembled end product. As is common industry practice, Microsoft exports its Windows operating system software (including the infringing Internet Explorer code) to foreign manufacturers on a number of master disks. These foreign manufacturers, otherwise known as Original Equipment Manufacturers (OEMs), then *replicate* the software contained on the master disks to computer hard drives which will eventually be sold outside the U.S. Of particular note is the fact that the exported master disk is not itself integrated as a physical component of the end product (i.e., the OEM-manufactured computer containing a copy of the infringing Internet Explorer software).

The damage analysis by the district court was upheld on appeal to the Court of Appeals for the Federal Circuit on the basis that the term "components", essential to the application of s. 271(f), included the software code on the exported master disks. The

³ "Distributed hypermedia method for automatically invoking external application providing interaction and display of embedded objects within a hypermedia document", U.S. Patent No. 5,838,906, (17 November 1998).

⁴ *Eolas Techs. v. Microsoft Corp.*, 2004 U.S. Dist. LEXIS 522 (N.D. Ill. 2004).

⁵ At the district level, the jury awarded \$1.47 USD per unit of infringing product, amounting to \$520,562,280 in damages.

patentability of software in general was not in dispute.⁶ The Court noted that all subject-matter patentable under 35 U.S.C. § 101 was to be afforded protection under s. 271(f), whether tangible (e.g., a machine) or intangible (e.g., a process).⁷ Of critical importance in the Court's decision was the characterization of the master disk software code as an integral component in the end product:

Exact duplicates of the software code on the golden master disk are incorporated as an operating element of the ultimate device. This part of the software code is much more than a prototype, mold, or detailed set of instructions. This operating element in effect drives the “functional nucleus of the finished computer product.” *Imagexpo, L.L.C. v. Microsoft, Corp.* Without this aspect of the patented invention, the invention would not work at all and thus would not even qualify as new and “useful.” Thus, the software code on the golden master disk is not only a component, it is probably the key part of this patented invention.⁸

While the Court refused to impose a tangibility requirement on a component for s. 271(f) to apply, it observed prior doctrine stipulating that the component must be physically supplied from the United States.⁹ Here, the software was being exported on actual master disks, thus meeting the physicality condition.

⁶ The recognition of software as patentable subject-matter under 35 U.S.C. § 101, at least as a process, was affirmed in *In re Alappat*, 33 F.3d 1526 (Fed. Cir. 1994); see *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352 (Fed. Cir. 1999); see MPEP § 2106.IV.B.1.a (8th ed., rev. 2 2001).

⁷ *Eolas*, *supra* note 2 at 1339-40; see *Union Carbide Chemicals & Plastics Technology Corp. v. Shell Oil Co.*, 425 F.3d 1366, 73 USLW 3673, 76 U.S.P.Q.2d 1705 (Fed. Cir. 2005), reh'g denied, 434 F.3d 1357, 77 U.S.P.Q.2d 1634 (2006) (holding that a catalyst, exported for use in a patented chemical process performed abroad, constitutes a “component” for the purposes of s. 271(f)); the Court in *Eolas*, at 1339, noted that the argument that all forms of invention should be treated equally under s. 271(f) is supported by the *Agreement on Trade-Related Aspects of Intellectual Property Rights*, Annex 1C to *The Final Act and Agreement Establishing the World Trade Organization*, 15 April 1994, 33 I.L.M. 81, online: World Trade Organization <http://www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm> [*TRIPS Agreement*], Part II, s. 5, art. 27(1), which states, “Patents shall be available and patent rights enjoyable without discrimination as to the place of invention, *the field of technology* and whether products are imported or locally produced” [emphasis added]. See also Alan M. Fisch & Brent H. Allen, “The Application of Domestic Patent Law to Exported Software: 35 U.S.C. § 271(f)”, (2004) 25 U. Pa. J. Int'l Econ. L. 557 at 575.

⁸ *Eolas*, *supra* note 2 at 1339 [citations omitted].

⁹ *Eolas*, *supra* note 2 at 1339; see *Pellegrini v. Analog Devices, Inc.*, *infra* note 52 at 1118; *contra AT&T Corp. v. Microsoft Corp.*, *infra* note 46 and accompanying text.

The ruling constituted a departure from prior, narrower interpretations of the scope of s. 271(f). Under a traditional understanding of the provision, the act of replication of a “supplied” component abroad would cease the possibility of liability for contributory infringement. In this case, the Court imputed an expansive definition to the phrase “supplie[d] or cause to be supplie[d] in [...] the United States” as the Court was willing to confer the same liability with regard to the original master version of the software (contained on the master disks) as with regard to the replicated version.

While patent holders rejoiced in an unprecedented victory, the American software industry was shocked at the possible ramifications of the *Eolas* decision. Patent holders were no longer necessarily restricted in the scope of their damage claims to domestic infringement (e.g., domestic sales). The larger geographical scope upon which damages could be assessed further incentivized patent holders to bring suit. Industry analysts feared that the decision would prompt software development companies to relocate their research and development operations and thousands of jobs abroad in order to escape the risk of similar verdicts.

2.2. *NTP v. Research In Motion*

Shortly after *Eolas*, the United States Court of Appeals for the Federal Circuit reen countered the extraterritoriality conundrum in *NTP, Inc. v. Research in Motion, Ltd.*¹⁰ Research in Motion (“RIM”), an Ontario-based company, provided mobile email service

¹⁰ *NTP, Inc. v. Research In Motion, Ltd.*, 418 F.3d 1282, 75 U.S.P.Q.2d 1763 (Fed. Cir. (Va.) 2005) [*RIM* cited to F.3d], aff’g No. 3:01CV767, 2003 WL 23325540 (E.D.Va. Aug. 5, 2003), rehearing and rehearing en banc denied (Oct 07, 2005), leave to appeal to U.S. refused, 126 S. Ct. 1174, 163 L.Ed.2d 1141 (Jan 23, 2006). The potential extraterritorial impact of this case was so great that The Canadian Chamber of Commerce, Information Technology Association of Canada, and The Government of Canada each filed *amicus curiae* briefs supporting RIM’s petition for panel rehearing and rehearing en banc.

(“Blackberry service”) through the use of wireless devices (“Blackberry” devices) enabled to use the company’s “push” technology.¹¹ The wireless service extended throughout North America, with a significant proportion of RIM’s customers being in the United States. While RIM was free to use the technology in Canada, the technology underlying the mobile email service was subject to prior patents held by NTP in the United States. NTP brought suit for patent infringement. Notably, RIM did not contest that its U.S. customers were using patented technology.¹² The crux of RIM’s argument rested on the notion that the use of the technology occurred outside of the United States since the “relay” component – a component critical to the functionality of the wireless service – was situated in Canada, and hence outside the jurisdiction of American patent laws. A jury verdict at the District Court held that RIM had directly infringed five patents and awarded NTP with damages exceeding \$53 million.¹³

Once again, comprehension of the underlying technology is helpful in understanding the nature of the problem. A critical component of the technology involves email redirection. When a user subscribed to the Blackberry service receives an email, the email is redirected to RIM’s wireless network in one of two ways: in the Corporate solution, the email is intercepted and redirected by software hosted on the user’s mail server before it ever reaches the user’s personal computer; in the Desktop solution, the email is forwarded by email redirector software installed on the user’s personal computer. In both cases, the email is routed to the Canadian-situated Blackberry “relay” component

¹¹ The “push” technology differs from that applied by conventional “pull” email applications in that instead of periodically checking (or “polling”) the email server for new messages, new email is immediately redirected by the server to one’s listening wireless device.

¹² *RIM*, *supra* note 10 at 1314.

¹³ Interestingly, after the district level verdict, each of the five patents at issue were reexamined and systematically ruled invalid by the United States Patent and Trademark Office. However, the rulings were not yet released at the time of the Court of Appeals decision.

for processing. The message is then routed to a partner wireless network and on to the user's Blackberry device. Outgoing messages from the handheld device follow the same steps, only in reverse. Importantly, all scenarios involve the email message being processed at RIM's "relay" component in Canada.¹⁴

Justice Linn of the Court of Appeals noted the nature of the problem in determining whether s. 271 could be applied to the Blackberry scenario:

Ordinarily, whether an infringing activity under section 271(a) occurs within the United States can be determined without difficulty. This case presents an added degree of complexity, however, in that: (1) the "patented invention" is not one single device, but rather a system comprising multiple distinct components or a method with multiple distinct steps; and (2) the nature of those components or steps permits their function and use to be separated from their physical location.¹⁵

Relying on the principle that direct infringement under s. 271(a) could only occur where the allegedly infringing activity occurred *wholly* within the United States, as set forth in *Deepsouth*, RIM contended that the location of its "relay" component outside the United States sufficiently precluded a finding of direct infringement. In construing s. 271(a), the Court was unable to find clear direction from the statute as to "how the territoriality requirement [, i.e., the wording, 'within the United States'], limits direct infringement where the location of at least a part of the 'patented invention' is not the same as the location of the infringing act."¹⁶ Further, the Court distinguished *Deepsouth* as being predicated on a situation where both the acts of "making" and of "using" the patented invention took place exclusively outside U.S. borders. *RIM*, however, involved an

¹⁴ *RIM*, *supra* note 10 at 1289-90.

¹⁵ *RIM*, *supra* note 10 at 1314.

¹⁶ *RIM*, *supra* note 10 at 1315.

invention that straddled national borders, with use of the invention potentially occurring within the United States.

Rejecting the applicability of *Deepsouth* to the transborder nature of the Blackberry service, the Court of Appeals instead looked to the legal framework established in the United States Court of Claims' decision in *Decca Ltd. v. United States*.¹⁷ Decca explored the extraterritorial ambit of American patent law where an essential component is located outside the United States. The invention at issue was "a radio navigation system requiring stations transmitting signals that are received by a receiver, which then calculates position by the time difference in the signals."¹⁸ The U.S. government was operating three such stations, one of which was located in Norway. Whereas the Court in *Deepsouth* had focused on where the technology was being "made", and specifically, where it was assembled into wholly operable form, the court in *Decca* centered on the location of the technology's "use".¹⁹ In this case, use of the radio navigation system occurred wherever the signals from the station were being received and employed to calculate position. The Court held for the plaintiff, placing particular emphasis "on the *ownership* of the equipment by the United States, the *control* of the equipment from the United States and on the *control and beneficial use* of the system within the United States."²⁰ Thus, despite an essential component of the invention being located extraterritorially, direct infringement was still found to have occurred within the United States.

¹⁷ *Decca Ltd. v. United States*, 210 Ct. Cl. 546, 544 F.2d 1070 (1976) [*Decca* cited to F.2d]. While *Decca* was argued in the context of government liability under 28 U.S.C. § 1498, a finding of direct infringement under s. 271(a) was a necessary predicate.

¹⁸ *RIM*, *supra* note 10 at 1315.

¹⁹ *Decca*, *supra* note 17 at 1081-82.

²⁰ *Decca*, *supra* note 17 at 1083 [emphasis added].

Notably, the Court in *Decca* restricted its analysis of the invention's "use" to the nature of the technology:

[I]t is clear from both the specification of the patent and the claim that the patentees' contribution was not in the manner by which a transmitter generated and radiated the signals, but rather it was in a system in which signals having a particular relationship were received from spaced sources and utilized in the receiver to arrive at a position fix. Had it been otherwise, that is, had the invention dealt with the generation of the signals themselves, it seems clear that utilization of those signals in this country would only have been incidental and that operation of the Norwegian station would have been beyond the reach of the U.S. patent laws.²¹

Accordingly, the Court in *RIM* recognized that the approach to be taken in determining infringement will differ depending on the type of infringing act and the type of claim.²²

Of importance was the distinction drawn between system and method claims. With regard to the system claims, the Court held that RIM's communication system (i.e., the Blackberry service) was, as a whole, being used within the United States since the company's U.S. customers "*controlled* the transmission of the originated information and also *benefited* from such an exchange of information."²³ Under this reasoning, the communication system was subject to the primacy of NTP's patented system claims and thus in violation of s. 271(a). Accordingly, the Court of Appeals ruled against RIM.²⁴ The Court reached a different conclusion with respect to the method claims.

Unlike with a system claim, a method claim comprises a series of operative steps. In accordance with established law, the Court noted that each step must have been "used"

²¹ *Decca*, *supra* note 17 at 1083.

²² *RIM*, *supra* note 10 at 1316.

²³ *RIM*, *supra* note 10 at 1316 [emphasis added].

²⁴ Ultimately, the RIM-NTP patent battle ended with a settlement, the terms of which granted RIM a license providing unfettered, future use of NTP's patented technologies in exchange for \$612.5 million; Research In Motion, Press Release, "Research In Motion and NTP Sign Definitive Settlement Agreement to End Litigation" (3 March 2006), online: RIM <http://www.rim.com/news/press/2006/pr-03_03_2006-01.shtml>.

within the United States before the claim could be held to be infringed.²⁵ Yet, an essential step in NTP’s method claims was the use of an “interface switch”. In RIM’s context, this step took place at its relay located in Canada. Since specific use of this critical component of the method claim did not take place within the territorial limits of the United States, the Court ruled that the claim as a whole could not have been infringed from a “use” perspective.

The adoption by the Courts of a “control and beneficial use test” in *Decca* and *RIM*, in order to appropriate jurisdiction over the defendants’ extraterritorial activities, signifies a substantial expansion of American patent laws abroad. Further, the test is open-ended, with the Courts providing little guidance as to the extent to which the test can be used to assume jurisdiction over foreign activities. The terms “control” and “benefit” are not easily verifiable, let alone quantifiable. How much *control* is necessary? How does one characterize *benefit*? Is any amount of *benefit* sufficient? Must both control and benefit be located in the United States or could either element satisfy the test by itself? The test’s ambiguous characterization, as set out by the Courts, creates unpredictability in the patent system, such that companies with multinational operations may be forced to rethink how they conduct business, especially with respect to U.S. customers.

The wording of s. 271(a) denotes that direct infringement could arise from any one of several acts – making, using, offering for sale, selling, or importing – occurring

²⁵ *RIM*, *supra* note 10 at 1318; see *Zoltek Corp. v. United States*, 51 Fed. Cl. 829 (2002) at 836, *aff’d* 442 F.3d 1345, 78 U.S.P.Q.2d 1481 (Fed. Cir. 2006) [*Zoltek (2006)* cited to F.3d], *reh’g denied*, 464 F.3d 1335 (Sept. 21, 2006), *leave to appeal to U.S. refused*, 75 USLW 3474, 75 USLW 3660, 75 USLW 3661 (June 11, 2007); see *Roberts Dairy Co. v. United States*, 208 Ct. Cl. 830, 530 F.2d 1342 (1976) [cited to F.2d] at 1354.

with respect to the patented invention *within* the United States.²⁶ Since the system claims were found to have already infringed under the act of “using”, further analysis under the other acts was only needed with respect to the method claims. The Court recited myriad Congressional, legislative, and treaty sources supporting the notion that direct infringement of a method claim required actual practice of the patented process and was thus limited to the act of “using”;²⁷ however, the Court was not willing to expressly assert that a method claim cannot be infringed by acts of “selling”, “offering for sale”, or “importing”.²⁸ Instead, the Court concluded that, in relation to the method claims, RIM did not offend any prongs of s. 271(a) since it did not commit any infringing act in performing *at least some* of the steps claimed, specifically, the step performed in Canada.

Turning to a discussion of s. 271(f), the issue arose as to how components of a process were to be deemed “supplied”.²⁹ RIM contended that it did not physically reship components from the United States to Canada for the purposes of combination. NTP argued that the location where the claimed system was formed was unimportant, and consequently, that components in the United States did not need to cross national borders

²⁶ The “offering to sell” and “imports into” prongs of s. 271(a) were added by the *Uruguay Round Agreements Act*, Pub. L. No. 103-465, § 533(a), 108 Stat. 4809 (1994), pursuant to harmonization obligations under the *TRIPS Agreement*, *supra* note 7. There has been some uncertainty as to whether these elements of s. 271(a) themselves have an extraterritorial scope. See DeFranco & Smith, *supra* Ch. 2 note 36 at 379-84, discussing the split district court decisions of *Quality Tubing Inc. v. Precision Tube Holdings Corp.*, 75 F.Supp.2d 613 (S.D. Tex. 1999) (holding that a domestic offer for a foreign sale does not constitute infringement) and *Wesley Jessen Corp. v. Bausch & Lomb, Inc.*, 256 F.Supp.2d 228 (D. Del. 2003) (holding that an unauthorized offer to sell within the U.S. caused a separate cause of action, unrelated to the location of the sale).

²⁷ *RIM*, *supra* note 10 at 1319-20; see *Zoltek (2006)*, *supra* note 25 at 1365 (“utility is extracted from a process concurrent with its being ‘practiced’”); see *TRIPS Agreement*, *supra* note 7, Part II, s. 5, art. 28(1) (clearly differentiating between product and process patents, such that whether the patented subject-matter is a process, infringement is only to be derived from “use” of the process and from using, offering for sale, selling, or importing products directly obtained by the process).

²⁸ *RIM*, *supra* note 10 at 1320-21.

²⁹ The Court forwent consideration as to whether the system claims infringed the provision since they already violated s. 271(a).

before s. 271(f) could be infringed. Once again, the Court reverted to the distinct nature of a claim over a process relative to one over a product.³⁰ A method claim was simply a series of steps, each of which had to be performed for the invention to have been practiced.³¹ But, the sale or supply of equipment to perform a process was distinct from the supply of the component steps of the process.³² In other words, RIM's supply of Blackberry devices and email-redirecting software to its U.S. customers did not constitute supply of any actual steps of the patented process for combination outside the United States, falling well short of violating s. 271(f).³³ Interestingly, the Court suggested that the wording of s. 271(f) may restrict it from applying to process patents as "it is difficult to conceive of how one might supply or cause to be supplied all or a substantial portion of the steps of a patented method in the sense contemplated by the phrase 'components of a patented invention.'"³⁴

The Court also considered whether RIM's transborder operations contravened the prohibition against the unauthorized importation of a product made by a process patented in the United States, as regulated by s. 271(g). In this case, the patented processes yielded an intangible information product (e.g., wireless electronic mail). However, in *Bayer AG v. Housey Pharmaceuticals, Inc.*, the Court of Appeals held that s. 271(g) only protected

³⁰ *RIM*, *supra* note 10 at 1322.

³¹ See *Zoltek (2006)*, *supra* note 23 at 1359.

³² See *Standard Havens Prods., Inc. v. Gencor Indus., Inc.*, 953 F.2d 1360 (Fed. Cir. 1991) at 1374 (holding that the sale of apparatus for carrying out a U.S.-patented process did not infringe s. 271(f) where the process was practiced abroad).

³³ *RIM*, *supra* note 10 at 1323.

³⁴ *RIM*, *supra* note 10 at 1322. See *Union Carbide Chemicals & Plastics Technology Corp. v. Shell Oil*, 434 F.3d 1357, 77 U.S.P.Q.2d 1634 (Fed. Cir. 2006), Lourie J. dissenting court's refusal to hear case en banc (arguing that s. 271(f) does not apply to process inventions since, in part, supplying a component to be used in one of the process steps does not equate to supplying the step itself).

against the importation of physical products.³⁵ Accordingly, abstract information could not be a “product” for the purposes of s. 271(g). NTP argued that a tangible structure, by virtue of the structure of the email message and its accompanying routing addresses, could be attributed to the information product so as to render it protectable under s. 271(g).³⁶ Relying upon the *Bayer* ruling, the Court found NTP’s argument unpersuasive, distinguishing between a “tangible result” and a “physical product”.³⁷ The fact that a process could produce a “tangible result”, rendering the process patentable under 35 U.S.C. § 101, did not necessarily impute the product of the process with the physicality required for s. 271(g) to apply. The Court concluded that the method claims were not infringed under s. 271(g), and in so doing, affirmed the territorial limitation of the section with regard to information products. Had the Court ruled otherwise, it may have opened the floodgates to infringement suits against information technologies involving the transmission of data within the United States as a part of a predominantly foreign process (e.g., Internet-based applications).

RIM signifies a shaping decision in U.S. patent law. Just as in *Eolas*, the Court of Appeals had extended the reach of domestic patent law abroad; this time, via the adoption of the control and beneficial use test. Whereas *Eolas* exemplified the extraterritorial scope of contributory infringement under s. 271(f), the Court’s emphasis on locality of use rather than locality of construction in *RIM* allowed for the unprecedented extraterritorial reach of a finding of direct infringement under s. 271(a). This ruling is of

³⁵ *Bayer AG v. Housey Pharmaceuticals, Inc.*, 340 F.3d 1367 (Fed. Cir. 2003).

³⁶ *RIM*, *supra* note 10 at 1323.

³⁷ *RIM*, *supra* note 10 at 1324.

great importance to foreign businesses with operations straddling international borders as direct infringement entails greater penalties than contributory infringement.

The Court also imposed several limitations on the extraterritorial reach of U.S. patent laws. The Court reaffirmed the territorial limitation of s. 271(a) as being “only actionable against patent infringement that occurs within the United States.”³⁸ While the circumstances in *RIM* were sufficient to capture domestic acts of actual beneficial use of a patented product, it follows that technology that is only being used in an auxiliary capacity to a more directly beneficial use abroad is less likely to attract liability. Further, the control and beneficial use test was only implemented in relation to product claims, and not to method claims.

Lastly, the case raises the important question as to whether the Court was entitled to apply U.S. patent law to an invention located, in part, outside the United States. While supposedly adhering to the intent of the s. 271, the Court’s expansive interpretation of “use” opens the door for further judicial distension of domestic patent laws. At what point is “use” actually considered beneficial? Is one domestic user sufficient to assume jurisdiction over an entire technology? This decision creates unpredictability in the patent system as well as the potential for an overbearing approach to patent law internationally. These dangers will be explored in further detail in the next chapter. After *RIM*, American patent law did not undergo another important development in the realm of extraterritoriality for another two years.

³⁸ *RIM*, *supra* note 10 at 1313. See *Pellegrini v. Analog Devices, Inc.*, *infra* note 52 at 1117; *Rotec Indus., Inc. v. Mitsubishi Corp.*, 215 F.3d 1246 (Fed. Cir. 2000) at 1251.

2.3. *AT&T Corp. v. Microsoft Corp.*

In 2007, the extraterritorial reach of s. 271(f) was reconsidered in *AT&T Corp. v. Microsoft Corp.*, but this time by the Supreme Court of the United States.³⁹ AT&T held a U.S. patent over a particular type of digital speech coder (“speech codec”), a software program that is able to both encode a speech signal into a more compact form and decode the compact data back into an audio signal resembling the original encoded sound.⁴⁰ AT&T alleged infringement by Microsoft due to the unauthorized incorporation of the patented speech codec technology in Microsoft’s Windows operating system software. As a preferred method of distributing its Windows software internationally, Microsoft provided a number of master versions of the Windows software (including the speech codec) to foreign computer manufacturers. The master versions were transmitted to the foreign manufacturers either on master disks or via electronic transmission. The foreign manufacturers were licensed to replicate the master versions for the purpose of generating copies for installation on computers to be assembled and sold outside the United States.⁴¹

From the case’s outset, Microsoft moved to preclude evidence of liability under s. 271(f) resulting from foreign replication and sale of the software. The software giant argued that: (1) software was intangible information and thus could not constitute a “component” for the purposes of the provision; and (2) in the alternative, no actual “components” were exported as required by the provision since the master versions of the

³⁹ *AT&T Corp. v. Microsoft Corp.*, 127 S. Ct. 1746, 75 U.S.L.W. 4307 (2007) [*AT&T* cited to S. Ct.], rev’g 414 F.3d 1366, 75 U.S.P.Q.2d 1506 (Fed. Cir. (N.Y.) 2005) [*AT&T (Fed. Cir.)* cited to F.3d], rev’g 2004 W.L. 406640, 71 U.S.P.Q.2d 1118 (S.D.N.Y. 2004).

⁴⁰ *AT&T (Fed. Cir.)*, *supra* note 39 at 1368, note 1.

⁴¹ *Ibid.* at 1368.

software were replicated only once they were outside the United States.⁴² Despite being rejected by the New York District Court, both assertions were reargued on appeal.

The Court of Appeals for the Federal Circuit affirmed the district court decision, ruling that the patent had been infringed upon. The decision was primarily based on long-standing principles of patent law and the Court of Appeals' 2005 decision in *Eolas*, which involved a similar fact pattern. Specifically, the Court of Appeals found that *Eolas* already established that s. 271(f) was not limited to physical structures, and accordingly, Microsoft's export of software constituted the supply of a "component" for the purposes of s. 271(f).⁴³ In assessing whether the foreign-made copies of the exported master version were supplied or caused to be supplied from the United States, the Court considered the manner in which software is generally supplied – by generating a copy. Justice Lourie, writing for the majority, noted that due to the irregular nature of software technology, "the act of copying is subsumed in the act of 'supplying,' such that sending a single copy abroad with the intent that it be replicated invokes § 271(f) liability for those foreign-made copies."⁴⁴ In other words, the foreign-made copies were to be treated as though they were supplied from the United States, as in the case of the master versions. Justice Rader dissented on this point, drawing a distinction between "copying" and "supplying".⁴⁵ The majority also noted that the medium used to export the component was irrelevant, such that software shipped on disks was to be treated in the same way as software transmitted electronically; the importance lay in the fact that the component was

⁴² *Ibid.* at 1368.

⁴³ *Eolas*, *supra* note 2 at 1339.

⁴⁴ *AT&T (Fed. Cir.)*, *supra* note 39 at 1370.

⁴⁵ *Ibid.* at 1372-73.

exported.⁴⁶ The Court further justified its decision as comporting with the legislative objectives behind the enactment of s. 271. Section 271 was enacted to encourage technological advancement and thus needed to be interpreted in light of the nature of the technology at hand. The Court noted that a ruling in favour of Microsoft would permit technical avoidance of the statute, subverting Congress' efforts at closing the loophole exploited in *Deepsouth*.

Justice Rader, dissenting, perceived the Court's ruling as "disregard[ing] the existing international scheme of patent law with potential consequences beyond a 'parade of horrors [in] the domestic software industry.'"⁴⁷ In his opinion, the judgment constituted an untenable extraterritorial expansion of U.S. law. Allowing s. 271(f) to be triggered by the foreign manufacture of a single "component" of a patented invention would give rise to endless liability under U.S. law for infringements that were best remedied under the law of the foreign jurisdiction. His disagreement centered on the meaning of "supply" in the context of the provision. Whereas the majority decision likened the act of "supplying" to "copying", Rader J. asserted that the acts were in fact distinct:

As a matter of logic, one cannot supply one hundred components of a patented invention without first making one hundred copies of the component, regardless of whether the components supplied are physical parts or intangible software. Thus, copying and supplying are different acts, and one act of "supplying" cannot give rise to liability for multiple acts of copying.⁴⁸

⁴⁶ *Ibid.* at 1370-71.

⁴⁷ *Ibid.* at 1372.

⁴⁸ *Ibid.* at 1373.

“Copying” was akin to “replicating”, “reproducing”, and “manufacturing”, but not “supplying”.⁴⁹ There was no doubt that Microsoft was liable for direct infringement under s. 271(a) for each copy of the master disk manufactured in the United States. In addition, under an explicit interpretation of the term “supply”, Microsoft was liable under s. 271(f) for the export of each of the master disks where the disks were to be used for assembly of a patented invention abroad. In this case, contributory infringement under s. 271(f) with specific regards to the export of the master disks was of little consequence since their manufacture already constituted direct infringement under s. 271(a). The true controversy lay with the replication of the master disks on foreign soil.

Radar J. believed that the majority’s expansive interpretation of “supply” and the Court’s ensuing conclusion transcended the Court’s authority by contravening existing precedent. First, the Supreme Court in *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.* had already confirmed that the rights conferred by U.S. patent law were not meant to extend beyond the United States and its Territories and thus, “infringement of [these] rights cannot be predicated on acts wholly done in a foreign country.”⁵⁰ Under the Court of Appeals’ expansive definition of “supply”, infringement of s. 271(f) would arise from the act of “copying” the master version, despite this act taking place after the master version had already left the United States (i.e., an “act wholly done in a foreign country”). This clearly violated the Supreme Court’s decree.

Second, the Court of Appeals’ characterization of the act of “copying” as being subsumed in the act of “supplying” purely in the context of software inventions

⁴⁹ *Ibid.* at 1372-73.

⁵⁰ *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, 235 U.S. 641, 35 S. Ct. 221 (1915) [cited to U.S.] at 650; accord *Int’l Rectifier Corp. v. Samsung Elecs. Co.*, 361 F.3d 1355 (Fed. Cir. 2004) at 1360; *Pellegrini v. Analog Devices, Inc.*, *infra* note 52 at 1117; *Rotec Indus., Inc. v. Mitsubishi Corp.*, *supra* note 38 at 1251.

contravened both domestic precedent and international treaty. The Court of Appeals in *Eolas* affirmed that the same treatment was to be given to all forms of invention as mandated by article 28 of the *TRIPS Agreement* which requires that “patents [...] be available and patent rights enjoyable without discrimination as to [...] the field of technology.”⁵¹ Thus, judicial interpretation of s. 271(f) should not distinguish between software and other technologies, a standard the majority failed to observe.

Third, the majority based its distinctive treatment of software as being reflective of the nature of the specific technology and business practices at issue. This reasoning countered the Court of Appeals’ 2004 ruling in *Pellegrini v. Analog Devices, Inc.*⁵² In *Pellegrini*, Analog Devices, a U.S. company, developed and manufactured integrated circuit chips overseas. The circuit chips represented an integral component of a brushless motor drive circuit which was protected by a U.S. patent. The patent holder, Pellegrini, claimed direct infringement and inducement of infringement on the basis that its patent covered the combination of Analog Devices’ circuit chips with various other components to construct brushless motors. There was no question that the circuit chips were made, sold, and shipped exclusively outside the United States.⁵³ Rather, the question was whether components manufactured outside the United States that were never physically shipped to or from the United States might nonetheless be considered to have been “supplied” or “caused to be supplied” to or from the United States for the purposes of s. 271(f). Pellegrini argued that the components were “supplied” or “caused to be supplied”

⁵¹ *Eolas*, *supra* note 2 at 1339-40; *TRIPS Agreement*, *supra* note 7, Part II, s. 5, art. 27(1); see note 7 (regarding technological neutrality of patent rights).

⁵² *Pellegrini v. Analog Devices, Inc.*, 375 F.3d 1113, 71 U.S.P.Q.2d 1630 (Fed. Cir. (Mass.) 2004) [*Pellegrini* cited to F.3d], leave to appeal to U.S. refused, 543 U.S. 1003, 125 S. Ct. 642 (Nov. 29, 2004).

⁵³ *Ibid.* at 1115.

from the United States on the basis that the components were designed in the United States and were manufactured, sold, and shipped subject to instructions transmitted from Analog Devices' offices in the United States.⁵⁴ The Court of Appeals rejected Pellegrini's arguments that the term "supply" referred to the point of corporate control of the components' manufacture. The Court noted that application of s. 271(f) centered on the location of the components and not the accused infringer.⁵⁵ The provision required a physical exportation of the components from the United States. Interestingly, the Court suggested that a manufacturer may be able to evade patent infringement by employing a foreign contractor to have the components manufactured extraterritorially.⁵⁶ Ultimately, the Court ruled that since the circuit chips were not manufactured in the United States, nor where they shipped to or from the United States (and thus were not "supplied" under s. 271(f)), the manufacturer could not be held liable for patent infringement.

The majority in *AT&T (Fed. Cir.)* judged *Pellegrini* as being inapplicable to the facts of the case, drawing a distinction between the fact that Microsoft supplied a component of the patented invention whereas Analog Devices had merely supplied instructions. Rader J. disagreed, noting that the "supplied" master disks were never actually assembled into the infringing product.⁵⁷ Conversely, the "components" that ended up in the infringing product were copies of the master disks, made outside the United States. These components were never "shipped" from the United States and thus did not meet the "physical exportation" standard established in *Pellegrini*. Further, the dissenting judge suggested that adapting interpretation of the statute to reflect the "nature

⁵⁴ *Ibid.* at 1116-17.

⁵⁵ *Ibid.* at 1117-18.

⁵⁶ *Ibid.* at 1118.

⁵⁷ *AT&T (Fed. Cir.)*, *supra* note 39 at 1374-75.

of the relevant technology and business practice” amounted to giving the Court an unwarranted, arbitrary discretion to attach liability where the Court “perceives that the patented component is cheaper or more convenient to replicate abroad than to ship from the United States.”⁵⁸

Turning to legislative policy, Rader J. observed that Congress enacted s. 271(f) to catch those that manufactured components of a patented invention within the United States and then exported them before assembly so as to avoid infringement. However, it did not intend to “attach liability to manufacturing activities occurring wholly abroad.”⁵⁹ Rader J. notes that this was evident from the wording of the provision which limited the attribution of liability to instances where components were supplied “in or from the United States.” Contrarily, the majority decision declines to give effect to the provision’s scope-restricting phrase “in or from the United States.” As examined in Chapter 2, the latter phrase is a critical limitation on the already expansive extraterritorial power of s. 271(f). By overlooking its relevance, the majority overstepped its authority by extending U.S. patent policy beyond the limits established by Congress. Consequently, the Supreme Court overturned the majority decision, recognizing that the Court of Appeals had overstepped jurisdictional boundaries in the face of the presumption against extraterritoriality.

In response to the first issue on appeal, the Supreme Court ruled that a copy of software could constitute a “component” under s. 271; however, software in the abstract could not. The distinction between tangible and abstract forms of software, overlooked by the Federal Circuit panel, is critical to the determination of which point in the

⁵⁸ *Ibid.* at 1374.

⁵⁹ *Ibid.* at 1375.

manufacturing process software would become a "component". Were abstract software be held to constitute a "component" for the purposes of s. 271(f), then the fact that the master versions were not themselves integrated into the foreign-assembled computers would be rendered irrelevant. The medium, whether the master version or a foreign replicated disk, would have no affect on the journey of the abstract Windows software from the United States to its integration in the foreign-assembled computer. Instead, the Supreme Court held that uninstalled Windows software, such as that contained on the master version disks (or electronically-transmitted copies), would not infringe since it was incapable of "performing" the patented speech codec; capability of performance was limited to installed, executable software.⁶⁰ The Court's reasoning turned on the requisite combinability of the component as evidenced by the statutory phrase "where *such components are uncombined* in whole or in part, in such manner as to actively induce the *combination of such components*" [emphasis added]. Software detached from a computer-readable medium (e.g., a disk) is uncombinable (e.g., cannot be installed or executed).⁶¹ The Court likened such abstract software to a blueprint, a set of instructions aiding in the combination of components, but not itself a "component".⁶² The inclusion of "information, instructions, or tools from which those components readily may be generated" in the scope of s. 271(f) was exclusively within the purview of Congress, not of the Court.⁶³

⁶⁰ *AT&T*, *supra* note 39 at 1750.

⁶¹ The Court's reasoning directly addressed AT&T's claim that object code or software instructions were themselves an integral component of computer technology despite needing to be combined with physical components to function. *AT&T*, *supra* note 39, Brief of the Respondent at 23-24.

⁶² *Cf. Pellegrini*, *supra* note 52 at 1116-19.

⁶³ *AT&T*, *supra* note 39 at 1756.

With respect to the second issue, of whether liability attached to the foreign-made copies of the software, the Supreme Court sided with Rader J.'s dissenting opinion at the Court of Appeals level. Since only the foreign-made copies of the exported master versions, and not the master versions themselves, were installed on the foreign-assembled computers, it could not be said that the software components integrated into the computers were "supplie[d] [...] from the United States."⁶⁴ The Court employed a strict interpretation of s. 271(f), noting that "copying" and "supplying" were indeed separate acts, and that the ease and cost of copying and transporting a component were irrelevant for the purposes of the provision.⁶⁵ Justice Stevens dissented on this point, functionally equating the master version to "a warehouse of components – components that Microsoft fully expect[ed] to be incorporated into foreign-manufactured computers."⁶⁶ He believed that to best heed s. 271(f), regulation of the indirect transmission of components, such as via a master version (to be replicated en mass), was required. The majority rebutted Stevens J.'s "warehouse" argument by noting that only foreign-made copies, and not the master versions "supplie[d] from the United States", were "warehoused" for integration in the product invention.⁶⁷

Until the Supreme Court's decision in *AT&T*, a clear extraterritorial expansion of U.S. patent law could be discerned from the case law, as seen in *Eolas*, *RIM*, and the lower court decisions in *AT&T*. However, the Supreme Court seems to have put an end to this trend. The impact of the decision cannot be overstated as it signals a shift in U.S.

⁶⁴ *Ibid.* at 1751.

⁶⁵ *Ibid.* at 1756 ("the extra step [of copying] is what renders the software a usable, combinable part of a computer; easy or not, the copy-producing step is essential").

⁶⁶ *Ibid.* at 1763.

⁶⁷ *Ibid.* at 1757, note 15.

patent policy and its role on the world stage. As will be examined in further detail below, the Supreme Court's narrow interpretation of the territorial scope of s. 271 in relation to intangible technologies reaffirmed the presumption against extraterritoriality. Further, the ruling alleviates fears of the overseas migration of American software research and development firms. Whether the courts will apply the same prudence with regards to future pioneering technologies that do not fit existing regulatory moulds remains to be seen.

Despite the positive impact of *AT&T* on the international aspects of patent systems, the ruling has only restrained the extraterritorial assertion of U.S. patent law in regard to software and information-based technologies. The unimpeded ability of the United States to regulate other forms of innovation extraterritorially still remains under s. 271.

3. The non-componential nature of software

Software features a number of unique characteristics setting it apart from most other patentable technologies. As illustrated in *RIM*, software's intangible nature allows for a distinction between the locality of the invention and the locality of its use. Distribution of a software invention allows for disproportionately large savings of material, shipping, and storage costs in comparison to a physical invention. As exhibited in *AT&T*, integration of software as a component part confronts conventional conceptions of "assembling" an invention. These qualities defy existing legislative and judicial frameworks aimed at applying domestic patent law extraterritorially. Further complicating the matter are U.S. treaty requirements mandating the neutral treatment of

all technologies under domestic patent law.⁶⁸ This section will examine software's inherently non-componential properties.

In *Eolas*, the Court of Appeals for the Federal Circuit supported a passive conduit approach to embracing software as a component under s. 271(f). The Court relied upon the Virginia District Court decision of *Imagexpo, L.L.C. v. Microsoft Corp.*, which involved a similar determination of the applicability of s. 271(f) to software exported on master disks for replication and assembly.⁶⁹ Ignoring the issue of tangibility, the Court in *Imagexpo* instead focussed on the critical role of the software code in the end product. Microsoft had argued that the exported software code was simply a template, which was not to be incorporated in the end device. The Court disagreed, noting that the master disks simply housed the “code-base” that was intended for the invention. Essentially, the template software constituted an ingredient rather than a recipe, and was thus considered to be a component.⁷⁰ The Court of Appeals in *Eolas* justified the adoption of such logic as sound on the basis that it met the technology neutrality standard, as required by multilateral treaty. Here, the Court exhibited a lack of proper understanding of the technology. The Court fallaciously indicated that software and hardware could be equally componential since “software morphs into hardware and vice versa.”⁷¹ Despite having the capacity to manipulate hardware, software can hardly be paralleled to hardware. While hardware can theoretically be constructed to elicit the same effect as a piece of software, it does not share software's peculiar characteristics, including intangibility, low cost and ease of manufacture and transport, and a relative ease of compatibility and integration.

⁶⁸ See *TRIPS Agreement*, *supra* note 7, Part II, s. 5, art. 27(1).

⁶⁹ *Imagexpo, L.L.C. v. Microsoft Corp.*, 299 F.Supp.2d 550 (E.D. Va. 2003) [*Imagexpo*].

⁷⁰ *Ibid.* at 552-53.

⁷¹ *Eolas*, *supra* note 2 at 1339.

The Court's failure to appreciate these inherent differences entails that the Court's imposition of a componential quality on software was unfounded.

The Supreme Court decision in *AT&T* offers different perspectives on dealing with the deviant nature of software. Justice Ginsburg, writing for the majority, judged it unnecessary to delineate whether liability under s. 271(f) would extend to the case where a master disk is used to install the Windows software directly onto a foreign computer, the disk being removed post-installation.⁷² Justice Alito, advocating the minority opinion, disagreed on this one point. Whereas the majority focussed on the importance of the foreign replication of the software towards determining whether the software eventually installed on the foreign-made computers was an exported "component", the minority scrutinized the lack of physical integration of the Windows code into the end product. The minority analysis was more sensitive to the nature of software technology yet did not go so far as the Court of Appeals in offering superior patent protection to software in relation to other technologies. The minority members agreed that for s. 271(f) to apply, the "component" required physicality and that it needed to be combined in the final product.⁷³ They observed that software took on the necessary physical form once it was installed on a computer (i.e., "in magnetic fields on the computers' hard drives").⁷⁴ Of particular note was that the CD-ROM used to install the Windows software remained unchanged throughout the installation process and could be removed after installation without affecting the performance of the installed Windows software. The "physical incarnation of code" on the CD-ROM was independent of that installed on the final

⁷² *AT&T*, *supra* note 39 at 1757, note 14.

⁷³ *Ibid.* at 1761.

⁷⁴ *Ibid.* at 1762.

product and thus could not be considered a combined “component”. Interestingly, the minority suggested that if the Windows software could not operate without maintaining the CD-ROM in the computer’s CD-ROM drive, then the CD-ROM might constitute a “component”. Nonetheless, the minority’s reasoning obviates the issue as to whether foreign-based replication of a master version before installation is relevant to the application of s. 271(f).

Another way of approaching the software dilemma, unexplored by the courts in either *Eolas* or *AT&T*, is to consider that software is copied rather than transferred at each stage in the distribution (or manufacturing) process. This line of thinking is akin to the minority opinion in *AT&T*, although the Court members pursued the necessity for physicality rather than addressing software’s intrinsic non-componential character. With other technologies, a component is transferred from one “container” to the next until it is integrated into the invention being manufactured, where the “container” is a convenient analogy for whatever medium is used to ship the component part. Of importance is that the component is transferred such that it is lost from one container and gained by another. Computer programs are not subject to the same form of transfer. A transfer of software necessarily entails its replication, such that the original computer program coexists with its copy; thus, the “container” argument fails for this technology.⁷⁵ Consequently, the original program is never “combinable” as integration into the end product implies installation of a copy and not the original version. As indicated by the wording of s. 271(f) per interpretation by the minority in *AT&T*, without the requisite “combinability”, software cannot be subject to the export limitations of s. 271(f). While this reasoning may

⁷⁵ Technically, even “moving” a computer program from one location to another involves first “copying” the program and then deleting the original version.

be seen by some as contrary to the intendment of s. 271(f), the reading fits within the bounds of the statutory text and does not discriminate on the basis of the nature of the technology or industry practices.

4. The presumption against extraterritoriality: revisited

The Supreme Court's reading in *AT&T* of s. 271(f) is reinforced by the presumption against extraterritoriality. As discussed in Chapter 2, it is generally accepted that domestic patent law is not meant to apply extraterritorially.⁷⁶ There are several reasons for this. For one, different jurisdictions may regulate patent violations in accordance with varying national patent policy. In other words, where an invention is patented in two jurisdictions, what may constitute infringement in one jurisdiction does not imply that the same action would constitute infringement in the other.⁷⁷ One nation's patent protection may be weaker than another or it may offer an altogether different form of protection. To presume parity between patent regimes would be to ignore the defining characteristics of the regime as implemented by local government.

The Court in *AT&T* recognized that patent law was bound to vary between jurisdictions and that foreign law may “embody different policy judgments about the relative rights of inventors, competitors, and the public.”⁷⁸ Justice Ginsburg, writing for the majority, noted the rationale for limiting patent laws to domestic borders:

⁷⁶ *AT&T*, *supra* note 39 at 1750.

⁷⁷ Fundamental to infringement is the eligibility criteria for patentability under a particular regime. These criteria can vary considerably from state to state. For instance, certain nations may choose to only protect innovation novel with respect to intra-state prior art whereas others may evaluate novelty on a global level; see Ch. 2, note 15.

⁷⁸ *AT&T*, *supra* note 39 at 1758, quoting Brief for United States as *Amicus Curiae* at 28; see *Brown v. Duchesne*, *supra* Ch. 2, note 20 at 187 (“The patent and copyright laws of a country stand upon the same

[F]oreign law alone, not United States law, currently governs the manufacture and sale of components of patented inventions in foreign countries. If AT&T desires to prevent copying abroad, its remedy lies in obtaining and enforcing foreign patents.⁷⁹

Were the presumption against extraterritoriality not respected, patent holders in one country, say Country A, would benefit from the effective enforceability of their patent in another country, say Country B. This would relieve the patent holders of the need to seek foreign patents in Country B, thus denying Country B of revenue, the ability to implement its own regulatory strategy, and strength or credibility relative to competing patent regimes. Further, the patent holders would be able to assert dominance over any existing competitors in Country B without having to meet the same standards of patentability and enforceability as those competitors. Such a competitive advantage could unfairly impact both domestic and international markets. Accordingly, patent holders should be left to seek other means of protecting technologies abroad (e.g., by foreign patents or by international accord) in lieu of stunting the free development of markets via the unilateral extraterritorial extension of domestic patents.⁸⁰

The Supreme Court's approach towards the extraterritorial extension of U.S. patent laws in *AT&T* is a reprise of its approach in *Deepsouth* of over three decades ago. In both cases, the Supreme Court refused to extend patent policymaking without express legislative intention, remarking that it was the responsibility of Congress to address any gaps in U.S. patent law.⁸¹ In particular, the Court in *AT&T* assumed that "legislators take

ground with navigation laws, and laws prohibiting altogether or restricting certain kinds of trade, for economical purposes, or to add to the military resources and strength, or to increase the effective power and industry of a country, or to develop its genius. As to these, each nation is the proper judge of its own policy.").

⁷⁹ *AT&T*, *supra* note 39 at 1759.

⁸⁰ See Ch. 2, note 45 and accompanying text.

⁸¹ *AT&T*, *supra* note 39 at 1759; *Deepsouth*, *supra* Ch. 2, note 41 at 531.

account of the legitimate sovereign interests of other nations when they write American laws,” and therefore, the Court was inherently bound to respect these foreign interests.⁸² The Court was of the view that s. 271(f) was legislated as a specific exception to and should be read in light of the presumption against extraterritorial regulation.⁸³ However, just as *Deepsouth* revealed a loophole in U.S. patent law, the Supreme Court in *AT&T* may have created another loophole around s. 271(f). The Court of Appeals had anticipated this eventuality in its decision, noting that a ruling in favour of Microsoft would permit technical avoidance of the statute. In a preventative effort, the Court of Appeals sought to regulate the foreign-made software by accommodating the nature of the technology and associated industry practices. The Supreme Court’s more deferential approach will allow for the unfettered exploitation and distribution of domestically patented software inventions abroad where the patent holder is either unwilling or unable to obtain patent protection.

However, the Supreme Court’s reinstatement of the presumption against extraterritoriality supports the approach advocated by this thesis: that while it is in the economic interests of both patentee and patenting nation to extend domestic patent protection internationally, this should not occur at the expense of international patent law and future harmonization initiatives.⁸⁴

⁸² *AT&T*, *supra* note 39 at 1758, citing *F. Hoffmann-La Roche Ltd. v. Empagran S. A.*, 542 U.S. 155, 164, 124 S.Ct. 2359, 159 L.Ed.2d 226 (2004).

⁸³ *Ibid.* at 1758.

⁸⁴ See Paul Margulies, "What's All the Fuss? The 'Parade of Horribles' When Applying 35 U.S.C. § 271(F) to Software Patents" (2006) 14 *Cardozo J. Int'l & Comp. L.* 481 at 510 (arguing that, in light of increasing globalizing trends, it would be unwise to undermine foreign patent policies and hinder harmonization efforts through the unilateral, extraterritorial extension of U.S. patent laws); accord Joan E. Beckner, "Patent Infringement by Component Export: *Waymark Corp. v. Porta Systems Corp.* and the Extraterritorial Effect of U.S. Patent Law" (2002) 39 *Hous. L. Rev.* 803 (arguing that "the anticompetitive effect of extraterritorialism on the ability of the public to compete in the global market place should be

5. Summary

This chapter has focused on U.S. law and judicial policy towards the application of patent laws extraterritorially, especially in the context of the non-componential nature of software. It reviewed the relevant provisions of 35 U.S.C. 271, as interpreted by the courts in *Eolas Technologies v. Microsoft Corp.*, *NTP v. Research in Motion*, and *AT&T Corp. v. Microsoft Corp.*

While the legislative framework of s. 271 sanctioned the extraterritorial reach of U.S. patent law, the subsequent developments of domestic law have been mainly by the courts. Section 271(f) was designed for predominantly physical, machine-based inventions, requiring its judicial interpretation to deal with the evolving base of patentable subject-matter in the last few decades. Fundamental changes in the nature of technology have rendered it difficult for the courts to apply the provision in accordance with its original intent.

Intellectual property policy is premised on the future development of innovative technologies. In order to effectively regulate the protection of such discoveries, existing policies must be able to anticipate and accommodate the challenges posed by the new technologies. The increasing prevalence of software-based technologies, the elusive nature of digital information, and the emergence of global markets, have all resulted in technological advancement outpacing changes to existing intellectual property frameworks. For years, courts have been helplessly left to apply archaic patent laws to

given substantial weight against any unfairness in allowing foreign patent-evasive techniques to continue without compensation to the U.S. patent holder").

unsuited, contemporary technologies. In general, the need to fit these elusive technologies within existing regulatory schemes has eclipsed the criticality of the presumption against the extraterritorial extension of domestic patent law as well as a need for the consistent application of patent rights to all forms of technology (i.e., tangible and intangible inventions alike). In the U.S., attempts at extrapolating legislative intent to software technologies have dramatically amplified the extraterritorial impact of domestic laws. The 2007 Supreme Court ruling in *AT&T* indicated a reluctance to further extend U.S. laws abroad without clear Congressional decree.

The next chapter argues that while there is an urgent need for the extension of domestic laws beyond national boundaries, doing so unilaterally (such as the U.S. had attempted) has the potential of interfering with foreign patent policy and can have detrimental consequences both domestically and abroad. The discussion reiterates, for the modern context, that the appropriate approach to the extending the protection of domestic innovation internationally is through regional and global international agreements. Among the most important of such agreements are the *The Paris Convention for the Protection of Industrial Property*, signed in 1883, which laid the foundation for a limited international harmonization of patent laws through the establishment of benchmark provisions, and the more recent *WTO Agreement on Trade-Related Aspects of Intellectual Property Rights* (TRIPS), which sets out the minimum standards of protection, procedures and remedies for enforcement of intellectual property rights, and dispute settlement procedures. Chapter 4 provides an in-depth discussion about the virtue of such agreements in the context of a paradigm shift from national to international patent protection.

Chapter 4

Protecting Innovation across Borders and the

Dangers of Extraterritorialism in Patent Law

1. Introduction

Chapters 1 and 2 established that the economic interests of patentees lie in enlarging the market area over which they have exclusive rights to exploit their innovation. In particular, Chapter 2 dealt with a mounting economic imperative for the international protection of domestic innovation. This evolution derives, in part, from a shift in the nature of patentable technologies. In the pre-modern period, largely up to the last quarter of the twentieth century, patents were commonly for industrial products and processes. However, as illustrated in Chapter 3, the impact of globalization and the emergence of software and information-based innovations challenge the adequacy of national patent protection. Extraterritoriality in patent law is one approach by which nations can pursue the pressing need for the international protection of domestic innovation. However, as this thesis suggests, extraterritorialism is not the ideal approach.

This chapter discusses the dangers arising from the unilateral extension of domestic patent policy extraterritorially. The granting of exclusive patent rights by domestic courts beyond national boundaries would infringe upon the sovereignty of other nations and possibly invite retaliation as well as raising issues of enforceability. Therefore, such a means of accommodating the international protection of patent rights is inadvisable. This thesis proposes that nations should heed the presumption against the extraterritorial extension of patent rights, discouraging legislatures and courts from regulating patent policy beyond the domestic jurisdiction. Further, this chapter argues

that the appropriate accommodation to the international protection of innovation should be through bilateral or multilateral treaties.

1.1. Reviewing the need for the internationalization of patent laws

As discussed in the preceding chapters, the premise behind patent law is to foster innovation. This is the underlying basis for its exchange of rights, where the patent holder is given a temporary, but exclusive, right to exploit the technology and the public is given access to the knowledge behind the technology.¹ While the effectiveness of patent laws on the furtherance of innovation has been questioned,² the importance of effective patent laws (that further innovation) on the economic growth of the country is considerable: a study by the Federal Reserve Bank of Cleveland on the relationship between economic growth and patents among U.S. states reported that the single best predictor of how a state's income will grow is the number of patents in the state per capita.³ Education ranked second.⁴

¹ See Ch. 2, note 13 regarding challenges to conventional notions of the patent bargain and social contract theory.

² See Ch. 2, note 1 (noting that only a small share of inventors choose to patent); *cf.* Ch. 2, note 6 and accompanying text (patents are more than just an input in the innovative process – they reflect technological success); *cf.* Ch. 2, note 8 (noting that patent protection may be considered an “implicit subsidy” to research and development).

³ P. Bauer, M. Schweitzer & S. Shane. “State Growth Empirics: The Role of Innovation and Education” (2006), online: Scott Shane <<http://wsomfaculty.cwru.edu/shane/innovation/I1.pdf>>, summarized at Federal Reserve Bank of Cleveland, Report, “2005 Annual Report: Innovation and Education are the Keys to Economic Growth”, 2006, online: FRB Cleveland <<http://www.clevelandfed.org/Annual05/index.cfm>>. Note that at the level of individual products and industries, many patents are not implemented so that they do not lead to any changes in production, while many that are implemented make negligible or small changes in production. Patents have also sometimes been used to create and perpetuate monopolies, which, in some cases, resort to restrictive policies that limit production of the relevant product and, by creating barriers to entry by other firms, may also limit innovation relative to that which might have occurred if there had been competition. The above cited empirical relationship is at the macroeconomic level and is between the total number of patents and economic growth. While it has been suggested by some that innovation would prosper and disseminate more freely and efficiently without the aid of patent rights, the issue is still under debate. In any case, this issue is beyond the scope of this thesis and will not be pursued here. *Cf.* Michele Boldrin and David K. Levine, Against Intellectual Monopoly, chapter 8 [unpublished,

It is likely that the greater the economic benefits that patentees derive from their innovations, the more powerful the incentives to innovate and the larger the number of innovations that will occur. These benefits are likely to be greater the larger the area in which patentees can exercise their exclusivity rights.⁵ This provides the basic economic argument for patentees to seek the international extension of their patent rights from their legislature, courts, and government.

In some respects, the legislature, judiciary, and government can be seen as manifestations of the state and its economic and other interests. Patent policy, expressed as legislation and its interpretation by the courts, seeks to pursue these national interests by granting innovators exclusive rights of exploitation over their innovations for a specified period. In addition to promoting the effective enforcement of these rights in the domestic jurisdiction, it benefits governments to seek the extension of its domestic patents to other countries through treaties and other means available to the government. It further seeks to enhance the effective enforcement of its patents abroad, which is sometimes attempted through political and economic pressure on other countries.

2007], online: David K. Levine <<http://www.dklevine.com/general/intellectual/againstnew.htm>> (arguing that intellectual property monopolies have an overall negative social impact as they: stagger the introduction of technologies into the market place, reduce competition and thus the ability to improve upon inventions, increase costs to consumers, as well as hinder the dissemination of inventions and their ensuing benefits.).

⁴ This study does not discount that a highly educated workforce is often at the heart of increased innovation.

⁵ Note that the focus in this chapter is not on the domestic market but on the international reach of patents. It is recognised that patents can have a significant disincentive to others to innovate if they are over-broad (the chilling effect). While such a disincentive for foreign innovators may not seem to be undesirable from a purely nationalistic viewpoint, it is also likely to apply to domestic innovators. In general, this thesis assumes that the patent regime has arrived at the right balance between providing adequate incentives to patentees and promoting (or not hindering) further innovation. However, it is recognised that the given policy regime may induce different effects in the context of different products and industries.

At the outset of the U.S. patent system in 1790, patents were almost wholly sought for industrial processes and products.⁶ However, in the late twentieth century, these were augmented by the notion that new knowledge whether or not it manifested itself as a manufacturing process or was a product in and of itself, was often worth protecting. Part of this change was driven by the rise of information technology as an industry. The importance of this industry has led some to label knowledge as “intellectual capital” and argue that knowledge has displaced traditional assets as the lifeblood of the U.S. economy.⁷

With this shift in the notion of what is patentable and the accompanying rise of the information technology industry, Justice Kennedy of the U.S. Supreme Court noted that “[i]n many cases now arising [...] the nature of the patent being enforced and the economic function of the patent holder present considerations quite unlike earlier cases. An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees.”⁸

The widening of the scope of what is patentable to include new information has produced not only a substantial growth in the number of patents granted but also an exponential rise in patent litigation. An illustration of this trend is provided by the following U.S. statistics: “Nationwide, the number of patent litigation cases more than doubled between 1991 and 2001; the number of patent litigation cases in 2005 was more

⁶ See Kenneth W. Dobyns, *A History of the Early Patent Office: the Patent Office Pony*, (Fredericksburg, Va.: Sergeant Kirkland's Museum and Historical Society, Inc., 1997) at 24, online: Kenneth Dobyns <<http://www.myoutbox.net/popstart.htm>> (e.g., the first and second issued U.S. patents were for a method of making potash and pearl ash and for manufacturing candles, respectively).

⁷ A good illustration of the change in function of the patent since its institution is the recent debate about the virtue of patent troll companies and their role in the patent system. These organizations exist primarily to gather licensing fees in order to capitalize on the increasing importance of the knowledge-based industry.

⁸ *eBay Inc. v. MercExchange, L.L.C.*, 126 S.Ct. 1837 at 1842, 78 U.S.P.Q.2d 1577 (U.S. 2006) [cited to S.Ct.].

than 19.5% greater than the number in 2001. In Marshall, Texas alone, where only 7 patent cases were filed in 2003, 116 cases have been filed in the last 16 months.”⁹ One study suggests that the rapid increase in patent litigation from the late 1980s to the late 1990s cannot be explained by shifts in firm patenting rates, R&D spending, firm value, or industry composition, but rather by legal policy changes.¹⁰

With intellectual capital as a major influence on the wealth of a nation, its standard of living, and the patentability of new knowledge, the international extension and enforcement of domestic patents has become even more important than in earlier centuries. This has been reinforced by globalization in recent decades. The world is becoming increasingly connected in terms of interactions among people and countries. Technological advances in communications (e.g., the emergence of the Internet) and transport (e.g., decrease in freight costs) have significantly reduced barriers to globalization, whether regarding trade or the free flow of information. Globalization trends have resulted in several important developments, two of which are: (1) the reduced significance of territorial borders; and (2) an increased reliance on intellectual property for economic prosperity.

Among the globalizing trends is the movement in the worldwide integration of national and regional economies towards a more unified world market rather than segmented markets. Countries are exporting and importing much more than before, which leads to increased interaction with other countries. However, local economies are

⁹ Coalition for Patent Fairness, online: Coalition for Patent Fairness <<http://www.patentfairness.org>> (accessed 1 August 2007).

¹⁰ Michael Meurer & James Bessen, “The Patent Litigation Explosion” American Law & Economics Association Annual Meetings, 2005, Paper 57, online: <<http://law.bepress.com/cgi/viewcontent.cgi?article=1532&context=alea>>.

usually regulated in accordance with policies specifically tailored to the local economy and society by local government. Often, these policies, to more or less extent, are incompatible with those of other nations.¹¹ As a result, globalization or attempts to promote globalization require a greater internationalization of patent laws. This requires some standardization of legal frameworks since national laws by themselves may not be sufficient to regulate transnational interactions.¹²

This chapter recognizes that though a few international accords (e.g., *TRIPS* and the *Paris Convention*) already exist to harmonize, to a degree, national patent laws, these accords are only a beginning to the internationalization of patent law. Further, such “global” agreements do not adequately accommodate the need to preserve self-determination of patent policy at a national level.¹³ Thus, on the one hand, uniformity of both patent procedures and enforcement mechanisms is beneficial to patent law internationally, but on the other hand, too great a uniformity hinders nations from best accommodating local interests.

¹¹ Present global interactions seem to favour bilateralism rather than true globalization. This may be in part due to the incompatibility of world traditions. Under Western thought, the effective and efficient operation of markets is dependent on the existence of appropriate legal structures. Other legal traditions may prefer a different approach. These differences can be somewhat incompatible, so that market efficiency is hampered by the need to cater to the common denominator of legal traditions. See Glenn, H. Patrick, *Legal Traditions of the World* (New York: Oxford University Press Inc., 2000).

¹² See *infra* section 5.3 for a discussion of harmonized versus more territorialistic approaches to the “internationalization” of patent law.

¹³ See *infra* section 5.2 for the rationale behind maintaining self-determination of patent policy in the internationalization of patent law.

2. The confinement of patent rights to the domestic jurisdiction

As argued in Chapter 2, patent rights granted by the U.S. Constitution have been interpreted by the courts to confer a monopoly over only the domestic U.S. market.¹⁴ This interpretation is based on the notion that the U.S. has no jurisdiction to unilaterally extend its patent rights to other countries and that any such attempt to extend its jurisdiction will not be recognized under international law. Therefore, competitors, including American ones, are free to exploit the knowledge embodied in a U.S. patent without infringing U.S. patent rights as long as they do so outside United States territory. In other words, a producer can, without fear of liability, manufacture U.S.-patented products off-shore and then export them to foreign markets provided it forgoes activity in the U.S. market. Thus, despite the free flow of patented knowledge extraterritorially, the regulation of said knowledge under domestic patent laws is to be territorially restricted.

On occasion, the United States has tried to regulate its patents off-shore, beyond its jurisdictional reach. Before 1984, a foreign producer could acquire all or a substantial part of the components from U.S. suppliers in order to assemble the final product abroad. This type of patent policy encouraged free-riding activities, including the foreign production of generic versions of U.S. patented products at a lower cost, thus thwarting American manufacturers from competing internationally. Further, it encouraged extraterritorial production by even U.S. firms, which could escape liability under U.S. patent law, even when that production was based on the patents of other U.S. firms, by

¹⁴ See *Dowagiac Mfg. Co. v. Minn. Moline Plow Co.*, *supra* Ch. 3, note 50 at 650; *Brown v. Duchesne*, *supra* Ch. 2, note 20 at 195; see *supra* Ch. 3, note 50.

locating their production facilities in foreign jurisdictions.¹⁵ In an attempt to curb off-shore manufacturing, the U.S. Congress enacted 35 U.S.C. 271(f) which sought to regulate the export of component parts of patented inventions abroad.

However, such an attempted extension of U.S. patent rights may do more harm than good. While s. 271(f) outlaws the export of parts for off-shore *assembly*, the provision has little effect on a producer's ability to *manufacture* U.S. patented products off-shore. The effect that it does have is in restricting the sources of ingredients or component parts used in the manufacturing process to suppliers in other countries. This could damage the American economy if other countries were to ever become competitive in the supply of parts. Functionally, the provision would have a much greater effect if the latter countries were to also prohibit the export of the component parts; however, this would require recognition by other countries of the monopoly conferred under the U.S. patent. Without the mutual recognition of patent rights between countries, off-shore manufacturers will simply seek component parts from other countries. In many cases, lesser developed nations can produce the component parts at a fraction of the cost. At this point, the effect of the extraterritorial policy is to simply isolate the domestic economy (e.g., by reducing the exports of goods and their component parts), whilst domestic knowledge is still being poached for exploitation abroad. Thus, without international recognition of domestic patent rights, a domestic provision such as s. 271(f) can even prove to be detrimental to domestic production. As will be explained below, it is

¹⁵ Before the enactment of s. 271(f), a U.S. firm could split its production operations such that the critical and patented step of assembling the components into the final product could be located abroad, relieving the firm of paying substantial licensing fees. Under such an operation, the necessary components could still be manufactured in and supplied from the United States, entailing relatively few or no licensing fees.

suggested that the best approach towards ensuring the international recognition of domestic patent rights is through bilateral and multilateral agreement.

A distinction may be drawn between domestic and foreign competitors in the foreign market. In his dissent in *AT&T (Fed. Cir.)*, Rader J. noted that the extraterritorial application of domestic patent law was not meant to regulate both groups: “Section 271(f) protects foreign markets from domestic competitors. Section 271(f) does not, or at least did not until today, protect foreign markets from foreign competitors. This court's expansion of § 271(f) to offer protection to foreign markets from foreign competitors distorts both the language and the policy of the statute.”¹⁶ As will be discussed below, the idea of regulating competitors differently within the same market poses its own complications.

From 1984 through to the notable Federal Circuit rulings of *Eolas*, *RIM*, and *AT&T (Fed. Cir.)* in 2005, U.S. patent policy seemed more intent on regulating the exploitation of U.S.-patented knowledge and less on respecting the presumption against extraterritoriality. The legislature and courts broadened the application of domestic patent law in terms of both geography (e.g., to off-shore assembly) and subject-matter (e.g., to intangible inventions such as software).

While this expansion was aimed at remedying abuses of the U.S. patent system (e.g., freeloading), it has also been viewed as a deterrent to domestic research and development. This is especially true of the software industry, in light of the ambiguity and difficulty in assessing patent infringement in software cases and the particular applicability of the aforementioned Federal Circuit cases to the subject-matter. Domestic

¹⁶ Rader J., dissenting, *AT&T (Fed. Cir.)*, *supra* Ch. 3, note 39 at 1376.

manufacturers would be at a higher risk, and thus at a competitive disadvantage, relative to their foreign competitors. The Court of Appeals' effective claim of jurisdiction and subsequent regulation over the output of foreign-made replications placed a higher burden on domestic vis-a-vis non-domestic industry as, in addition to being subjected to foreign patent law, local manufacturers would be subject to U.S. patent law for extraterritorial activities (e.g., replication). The latter double-regulation would have a devastating effect on the U.S. economy as it would have prompted manufacturers to relocate their research and supply operations outside the United States so as to avoid infringement of U.S. patent laws. This was briefly touched upon at the Court of Appeal level in *AT&T*. Microsoft had argued that an unfavourable ruling could trigger disaster for the domestic software industry. The Court refused to accept this reasoning as such deliberations were to be left for Congress.¹⁷ Nonetheless, the imbalance in potential liability between domestic and foreign-based software manufacturers, as created by the Federal Circuit rulings, was partly resolved by the Supreme Court's restrictive interpretation of the scope of s. 271(f) in *AT&T*.¹⁸

This interpretation that the application of patent law should only be given a domestic reach is primarily based on the notion that to do otherwise would impinge on the jurisdiction of other patent systems. Under this interpretation, protection against foreign infringement is to be accomplished by foreign patent law, so that a company that wants to protect its intellectual assets in a foreign jurisdiction had to do so by registering the relevant patents in that jurisdiction. While doing so in very many jurisdictions is

¹⁷ *Ibid.* at 1372.

¹⁸ As Chapter 3 notes, the restraint on the extraterritorial assertion of U.S. patent law as established by the *AT&T* ruling is only directly applicable to software and information-based technologies. Section 271 still remains effective with regard to other forms of innovation.

costly and prohibitive, it is feasible if few foreign countries have the actual capacity to exploit the patent knowledge. To some extent, this was workable in the eighteenth and nineteenth centuries since the patents of the time were for industrial products and very few countries of the world had industrialised. At the present time, since very many countries are already industrialised, the international extension of rights to exclusive production of an innovation by patenting in all the different jurisdictions that could potentially exploit the patented knowledge through production has become prohibitive. Moreover, multinational corporations can now set up industrial production even in countries that are not sufficiently industrialised and on their own could not effectively utilise the patent process in production. Therefore, patent laws with only a domestic reach would produce for the patentee very limited returns, thereby undercutting the argument that patents provide significant incentives to further research and development expenditures. This creates a demand for the international extension of patent rights through other arrangements such as bilateral treaties and multilateral organisations.

3. Paradigm shift from national to international patent protection

As has been intimated earlier, national patent protection may no longer be a suitable approach to regulating transnational technologies. This section discusses in further detail the pressures leading to a paradigm shift from conventional notions of the protection of innovation at a national level to more pragmatic international schemes.

3.1. Problems with independent national patent protection

The Supreme Court's *AT&T* ruling once again raises the issue of free-riding. Should companies be able to freely benefit from domestic innovation by exploiting it in foreign markets without incurring liability for such exploitation? The Supreme Court's decision opened the door to manufacturers to export local innovation for foreign distribution by simply inserting an intermediate replication stage. A company could export, reverse engineer, and replicate a single legitimate copy of an invention and then distribute the copies at a minute fraction of the development cost of the invention. Had a similar scheme taken place domestically, the distributor would generally have had to pay licensing fees, which are intended to help recover the invention's research and development costs. Without the necessity of licensing fees, a foreign distributor is able to benefit from the research and development of the original inventor without defraying any of the costs.

Given the restriction of patent rights only to the domestic jurisdiction, if a patentee wanted patent protection in a foreign market, it would have to secure a separate patent in that jurisdiction.¹⁹ As previously noted, patenting is costly and can become prohibitive if it has to be done in many different countries. Further, many more countries are enabled industrially today than were in the past, such that production of inventions could easily occur abroad. Thus, the economic incentive to invest in innovative research and development is decreased as there will always be the risk of a foreign manufacturer exploiting the technology at a fraction of the cost. Further, such freeloading in an internationally competitive arena can prove to be quite damaging to foreign sales for the

¹⁹ See Rader J., in dissent, *ibid.* at 1376 ("It should not be the position of a domestic patent regime to police foreign jurisdictions").

original inventor as he will be at a competitive disadvantage, economically, with respect to his foreign market competitors. It is therefore in the economic interests of nations to seek the international extension of patent rights through bilateral agreements and international treaties in order to maintain economic incentives in investing in research and development by diffusing the costs of foreign patent protection and advancing its enforceability internationally.

3.2. The shift in the nature of patentable products

An evolution in the nature of innovative technologies is in part responsible for the paradigm shift from national to international patent protection. Whereas conventional inventions were based on physical products, countless new innovations are of an intangible nature (e.g., software and information-based technologies). This physical elusiveness allows for use of the technology in such a manner as to straddle patent jurisdictions (e.g., the same software platform being accessed across multiple jurisdictions).

Conventional patent policy falsely presupposes technological neutrality. International patent schemes such as the *TRIPS Agreement* mandate the equal treatment of technologies under domestic patent law.²⁰ Such policy was illustrated in the Federal Circuit's approach towards regulating software in an equivalent manner to a structural product in *Eolas*:

²⁰ *TRIPS Agreement*, *supra* Ch. 3, note 7 at Part II, section 5, art. 27(1) (“[P]atents shall be available and patent rights enjoyable without discrimination as to the place of invention[] [and] the field of technology [....]”).

Sound patent policy also supports the meaning of section 271(f). In the first place, this court accords the same treatment to all forms of invention. [...] This court cannot construct a principled reason for treating process inventions different than structural products. Moreover, as the district court pointed out, process and product — software and hardware — are practically interchangeable in the field of computer technology. On a functioning computer, software morphs into hardware and vice versa at the touch of a button. In other words, software converts its functioning code into hardware and vice versa. Thus in the context of this patented invention, the computer transforms the code on the golden disk into a machine component in operation. Thus, sound policy again counsels against varying the definition of “component of a patented invention” according to the particular form of the part under consideration, particularly when those parts change form during operation of the invention as occurs with software code.²¹

However, the evolving nature of innovative technologies requires a trade-off between specificity in protection and the effectiveness of the protection.²² The particular characteristics of software and information-based technologies were discussed in Chapter 3 and include intangibility, low cost and ease of manufacture and transport, and a relative ease of compatibility and integration. Treating all technologies in the same way is tantamount to ignoring those particular characteristics that differentiate one generation of technology from another. Consequently, traditional patent schemes, even international ones, are not equipped to deal with certain emerging technologies.

A blanket approach covering all technologies is not the answer. Proper treatment may be better achieved through a more territorialistic approach. This is particularly true since nations at different stages of economic development are likely to encounter the need for such regulation at different stages and in varying capacities.²³ For instance, in

²¹ *Eolas*, *supra* Ch. 3, note 2 at 1339-40. Similarly, the Supreme Court ruling in *AT&T*, though a reversal of the Federal Circuit’s approach to extraterritoriality in *Eolas*, did not create a special exception for software regarding s. 271(f). Excluding software from the application of s. 271(f) or altering the extent of the section’s application to the technology would have contravened treaty obligations requiring a technologically neutral approach.

²² See Graeme B. Dinwoodie & Rochelle C. Dreyfuss, “International Intellectual Property Law and the Public Domain of Science” (2004) 7 J. Int’l Econ. L. 431 at 443 (suggesting that a “formalist commitment to technology neutrality is inconsistent with a purposive reading of the TRIPS Agreement”).

²³ See *infra* section 5.2 for a more focussed discussion of national self-determination in international patent law.

some countries, there may be a greater need to regulate agricultural innovations than pharmaceuticals.²⁴

This proposition is supported by academic scholars such as Graeme B. Dinwoodie and Rochelle C. Dreyfuss who advocate a more flexible approach to forms of national implementation of intellectual property norms in WTO member states, which in and of themselves impose constraints on state lawmaking:

[I]nternational lawmakers and adjudicators must take into account political strategies found in national lawmaking, including the practice of tradeoffs, the increasing need to refer to technological or social practices in fashioning appropriate levels of legal protection, and the capacity of non-intellectual property regimes to work in combination with traditional intellectual property rights.²⁵

It is therefore suggested that bilateral and some multilateral agreements would offer more efficient regulation of emerging technologies whilst still maintaining some international coordination of patent laws.

3.3. Differentiation in the level of protection offered for inventions across borders

Were the protection of innovation to be dealt with on a national rather than at an international level, as it is currently, one is bound to encounter instances of imbalance in the level of protection offered by different regimes, with the result that users in one country are held to a different standard than users in another country.²⁶ Such inconsistency is likely to lead to unpredictability and unfairness across patent systems.

²⁴ Yu, *supra* Ch. 1, note 14 at 432-33 (noting that some countries may prefer to regulate certain industries and technologies at different levels).

²⁵ Graeme B. Dinwoodie and Rochelle C. Dreyfuss, "TRIPS and the Dynamics of Intellectual Property Lawmaking" (2004) 36 Case W. Res. J. Int'l L. 95 at 121-22.

²⁶ This territorialistic form of protection is somewhat suggested by the previous section, but here it is presupposed that no international agreements exist extending these protections beyond the domestic jurisdiction.

Further, developers may be encouraged to design their products giving preference to users in certain jurisdictions over others (by investing more in R&D to this effect), recognizing that these jurisdictions better protect the developer's interests in comparison to other jurisdictions.²⁷ This scenario is likely to advance the knowledge-base of certain countries more than of others, creating an international disparity.

As the world moves towards a more advanced stage of globalisation, innovation is likely to become increasingly more collaborative and transnational in nature. It is bound to impact the economic welfare of nations, whether or not the patent regimes of those nations are prepared to regulate such inventions. For instance, Country A's patent policy may not extend so far as to protect newly developed subject-matter (e.g., just as, at one time, software and biotechnologies were not covered under conventional patent schemes). While the nation's domestic manufacturers may not have the means to engage in production of a technology, this does not necessarily preclude enabled foreign (third-party) manufacturers from establishing facilities in or migrating operations to the region in order to avoid high patent licensing fees that would be due had the operations been established in nations where the technology was patented (say, Country B). As such, Country B has a right to be concerned about the overseas protection (in Country A) of proprietary technology patented within its jurisdiction. Without the recognition of the Country B's patent rights over such innovation by Country A, Country B is at risk of losing both investments in its economy (e.g., by potential licensees) and faith in the

²⁷ However, it is recognized that certain jurisdictions may not be sufficiently technologically-enabled in certain fields and would thus not necessarily benefit from such innovations even if they were to be made available to the nation.

effectiveness of its patent regime. Consequently, there is a need to bring increased and up to date standardization of patent laws to these regions.

3.4. The pressure for international patent protection from globalization of knowledge

The world has been evolving towards a uniform set of knowledge, such that many countries have very similar knowledge in many spheres. This raises the possibility that similar technologies may be developed independently of one another in different jurisdictions. The idea of independent creation is accommodated under other forms of intellectual property protection, such as copyright and trade-secret protection. But, patent law provides a higher standard of protection over creativity. At issue is whether jurisdictionally-independent creations should be entitled to protection under their own jurisdiction's patent laws. There was a time when similar innovations separated by long distances could fairly reliably be assumed as being independent due to a restriction in the flow of knowledge and information. However, modern-day communication has created the virtual free-flow of information such that independence in development is made all that much harder to prove. This freedom of information, and hence innovation, is a prominent reason for the need for some amount of standardization among the world's patent systems.

4. The extraterritorial extension of patents through international agreements

As mentioned earlier, one mode of obtaining protection of an innovation in foreign markets is by obtaining patents in those jurisdictions. Given the costs of patenting in multiple countries and the dilution of the returns to patenting because of globalization,

a country could attempt to achieve the extension of its patent policy through a unilateral imposition of the rights of its patentees on other countries. However, such an imposition of its domestic patent policy upon another hinders that other nation from effectively implementing its own patent policy, so that while an imperial country could do so over its colonies, other independent nations would resist such an imposition. Further, notwithstanding that other nations are likely to object to having their patent jurisdiction intruded upon, a nation unilaterally imposing its patent policy extraterritorially is inviting others to affront the authority of its own patent regime.²⁸ Consequently, in fear of weakening the relative strength of their own patent regime, American courts have generally exercised a presumption against the extraterritorial extensions of U.S. patent laws.

Instead, it is argued that the considerable economic need in the age of globalization to ensure the extraterritorial extension of domestic patents to other countries should be accommodated through mutual agreements and treaties.

4.1. The benefits from extraterritorial access to new knowledge

Nations profit from the control of information that entails economic benefits, and from the increase in such information. The knowledge possessed by a nation's residents corresponds to its intellectual property assets. However, there is also a pool of knowledge that it does not possess but which other countries' residents may possess. Stepping outside its borders to access this knowledge increases the country's intellectual property assets, which in turn, fosters increased economic prosperity.

²⁸ Affronts to patent practice may be manifested in a number of ways, including the non-recognition of foreign judgments and reciprocal rulings of infringement.

The narrow pursuit of national economic advantage would mean that each country would seek to deny other countries access to its knowledge, while trying to get access to their knowledge. This would mean somehow denying access to other countries the information that is disclosed in its patents, while ensuring access to the information that is in their patents. Such an asymmetric policy has an inherent conflict in it. There are two possible resolutions to this conflict. One of these is to deny the extraterritorial application of any country's patents over all other countries. The other is to grant to each country's patents extraterritorial application over all other countries. The latter is more consistent with the globalization of production and sales. However, the interests of individual countries in this solution differ considerably.

Consider the expected (incentive-driven) behaviour of nations in entering patent treaty negotiations. As Chapter 1 argued, Country A with more patented innovations has an incentive to enter into a patent treaty with Country B with less patented innovations; but, Country B does not have an incentive to do so, since the treaty for mutual enforcement of each other's patents would bar its producers from freely using the patents in Country A. This reasoning indicates that it would be unlikely for two countries to reach a bilateral agreement that would extend each country's patents to the other.

However, in the above example, Country B could be persuaded to enter into a patent treaty with Country A when it is made part of wider negotiations from which Country B believes that it benefits on an overall basis. For example, comparing the United States and China, while the United States would benefit from the enforcement of an extensive number of U.S. patents in China, China would not do so on a net basis since this would hinder its generic production of products covered by the U.S. patents.

However, if a patent treaty is made part of the wider access of Chinese products to the very large U.S. market, from which China benefits considerably, China could have a net advantage from the overall context of trade with regards to patent protection. Hence, while a treaty solely for the extension of patent rights between two countries may not appeal to both countries, a wider treaty, of which such a patent extension is only a part, may appeal to both countries and become feasible. This appeal is often further enhanced by multilateral agreements that apply to many countries simultaneously.

Of course, in addition to national economic interest, treaties on the mutual recognition of each other's patent laws and judgments have depended on several key factors, among which are: (1) the extent to which the foreign law does not conflict with domestic policy; and (2) the extent to which the foreign state would recognize and enforce the other country's law; and (3) consistency between the "patent identities" of the countries. Of these, (1) and (2) are often easier to satisfy. In such a case, countries may enter into bilateral or multilateral agreements to recognise and enforce each other's patents. Condition (3) is harder to satisfy, such that few countries proceed to harmonize their patent identities.

4.2. The concept of national patent identities and the harmonisation of patent laws

Each nation can be said to have a "patent identity", which specifies the way in which it formulates, interprets, and enforces its policies on patents. This identity is based on the country's legal traditions and thus is a local one, usually different from and sometimes even in conflict with that of other countries. An example of different patent identities, at a general level, tends to occur between common and civil law jurisdictions,

even though both of these are found within the broader West European and American traditions. Civil law jurisdictions often feature specialized courts (or judges with an intellectual property background) that are more proficient at dealing with the technical complexity of patent issues than a general law court.²⁹ Specialized courts are thought to provide higher correctness and predictability of the result, as well as increased efficiency by virtue of a streamlined process that decreases the costs and duration of litigation. Certain common law jurisdictions have also adopted specialized patent courts, including the United States, where the Court of Appeals for the Federal Circuit is responsible for reviewing appeals from the Patent Office's Board of Appeals.³⁰ The difference between patent identities is likely to be even greater between Western traditions and those with completely different legal approaches, such as those of China.³¹

In any international attempt to harmonize patent rights to some minimum standard, each nation is likely to push forward its own interests by attempting to extend its patent identity to other nations. In this process, it is likely that dominant nations, in a more powerful economic position, are more likely to succeed in imposing their patent identity over weaker ones so that the patent identity of the weaker nations is likely to be

²⁹ For instance, Germany and South Korea feature a bifurcated patent court system with a specialized patent court for patent validity decisions whilst infringement issues are dealt in the ordinary civil courts; in addition to intellectual property divisions in Tokyo and Osaka district courts, Japan established an Intellectual Property High Court in Tokyo in 2005; and Thailand founded its Intellectual Property and International Trade Court in 1997.

³⁰ In the alternative, civil actions may be brought against the Director in the United States District Court for the District of Columbia, which is itself considered a specialized court. The Court of Appeals for the Federal Circuit incorporated the United States Court of Customs and Patent Appeals upon its formation in 1982. Other common law jurisdictions that have adopted special policies for hearing intellectual property cases include Australia, where the Federal Court docket is managed so as to assign intellectual property cases to those judges with education and experience in intellectual property, and the United Kingdom, where the Patents Court of the English High Court is a specialized court of the Chancery Division that has exclusive jurisdiction to hear patent cases.

³¹ China set up intellectual property trial divisions in particular High People's Courts around the country. The specialized courts feature a three person panel of two technicians with expertise in the field and a judge, each of which cast their votes equally.

subjugated to more or less extent. Accordingly, it is suggested that harmonization of formerly divergent patent identities is likely to occur through provisions of international treaties.

4.3. The comity principle

The international extension of domestic patent law has the potential to cause international conflicts on the issue of infringements of patents in one country by firms in other countries. This conflict is lessened if there exists “comity” between the nations concerned. Such comity between nations is critical to the long-term sustainability of harmonious international relations among them.

Comity between nations is the mutual recognition of each other's laws, institutions, and enforcement. It requires reciprocity between nations. A basic component of such comity is that none of the nations seeks to unilaterally extend its patents to other nations. The operation of international relations with regard to intellectual property is premised on the doctrine of comity. The existing comity of the mutual recognition of laws and trust established among nations is likely to be disrupted by any attempt to assert the unilateral extraterritorial extension of patent rights to other countries.³² Consequently, the extraterritorial application of patent law has the potential to cause international discord.

³² See Jennifer Giordano-Coltart, “Walking the line: why the presumption against extraterritorial application of U.S. patent law should limit the reach of 35 U.S.C. § 271(f)” 2007 Duke L. & Tech. Rev. 4 at para. 23 (arguing that s. 271(f) should be interpreted conservatively to avoid disrupting the comity-based international scheme of intellectual property rights).

4.4. *International conventions on the harmonisation of patent laws*

Since the late nineteenth century, efforts aimed at internationalizing patent law have resulted in a few important conventions. However, the effectiveness of these supranational accords has been criticized for neither adequately accommodating emerging technologies,³³ nor suitably balancing international uniformity with national autonomy.³⁴ It is suggested that general harmonization accords represent an inflexible approach to the internationalization of patent law and that bilateral and multilateral agreements would provide a more suitable alternative.

The *Paris Convention for the Protection of Industrial Property* was signed in 1883 and laid the foundation for a limited international harmonization of patent laws through the establishment of benchmark provisions.³⁵ Among the convention's many substantive standard-setting contributions lies its specification of national treatment.³⁶ Under the national treatment principle, a member state must grant the same protection to citizens of other member states as it would to its own citizens:

Nationals of any country of the Union shall, as regards the protection of industrial property, enjoy in all the other countries of the Union the advantages that their respective laws now grant, or may hereafter grant, to nationals; all without prejudice to the rights specially provided for by this Convention. Consequently, they shall have the same protection as the latter, and the same legal remedy against any infringement of their rights, provided that the conditions and formalities imposed upon nationals are complied with.³⁷

³³ See *supra* section 3.2.

³⁴ See Yu, *supra* Ch. 1, note 14.

³⁵ *Paris Convention for the Protection of Industrial Property*, March 20, 1883, revised most recently at Stockholm on July 14, 1967, and amended on September 28, 1979 [*Paris Convention*]. Note that the convention has 171 members, and is recognized as one of the most widely adopted treaties worldwide.

³⁶ *Ibid.*, art. 2.

³⁷ *Ibid.*, art. 2(1).

The *Paris Convention* provided an early codification of the comity principle. This principle now forms an integral part of the World Intellectual Property Organization (WIPO) rules and the *TRIPS Agreement*.³⁸

The dominant patent harmonization initiative at the global level has undoubtedly been the *Agreement on Trade-Related Aspects of Intellectual Property Rights*.³⁹ Before TRIPS, intellectual property regulation was mainly a patchwork of national laws and conventions.⁴⁰ The substantive provisions of the TRIPS agreement set out minimum standards of protection, procedures and remedies for enforcement of intellectual property rights, and dispute settlement procedures. Wendy Adams points out that TRIPS does not necessarily promote uniform law, but rather minimum standards of protection that can be increased to better suit domestic interests, and that the higher patentable base of a country may induce it to increase protections beyond that in other countries.⁴¹

4.4.1. Escape clauses allowing non-conformity

The WTO's TRIPS rules allow for the suspension of patent rights on medicines under compulsory licensing schemes if their production or imports are intended to fight a public health crisis.⁴² Instances of this occurred in 2006 and 2007 when countries such as

³⁸ See e.g. WIPO, *Patent Law Treaty*, 1 June 2000, art. 15, online: WIPO <<http://www.wipo.int/treaties/en/ip/plt/index.html>> (entered into force 28 April 2005) (obligating member nations to comply with the *Paris Convention*).

³⁹ *TRIPS Agreement*, *supra* Ch. 3 note 7, arts. 27-34.

⁴⁰ See Yu, *supra* Ch. 1, note 14.

⁴¹ See Wendy A. Adams, "Intellectual Property Infringement in Global Networks: The Implications of Protection Ahead of the Curve" (2002) 10 Int'l J.L. & Info 71.

⁴² *TRIPS Agreement*, *supra* Ch. 3, note 7, arts. 30 (allowing for "limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties"), 31 (allowing for ad-hoc compulsory licensing schemes). Such schemes allow for the production and purchase of generic versions of patented products

Thailand and Brazil produced, imported, or exported generic AIDS drugs based on patent ones, and argued that they were needed to help fight an emergency health epidemic.

4.4.2. *Enforcing TRIPS*

Leaving aside the escape clauses of the *TRIPS Agreement* allowing legitimate infringement of patents, there often occur very substantial, illegal infringements of patents held by foreign entities. However, transborder enforcement is almost non-existent on a multi-jurisdictional level. Enforcement mechanisms are generally of the form of trade sanctions, in accordance with the WTO rules. However, as per article 41(5), TRIPS does not require countries to have an adequate administrative capacity for enforcement, leaving ample room for the non-enforcement of its provisions.⁴³

Complaints to the WTO over infringement of patents by foreigners are common. As an example, the U.S. and Canada have often complained to the WTO about China's lackadaisical enforcement efforts when it comes to cracking down on infringement, and thus the country's failure to meet WTO intellectual property standards as per the *TRIPS Agreement* and related accords.

Thus, conventional methods of international protection of patents fall short of ideal. Considering the varying economic interests that must be accommodated by such agreements, it is unlikely that further agreements will be any more effective. This is primarily due to an increasing dilution (due to accommodations of the varying economic

under reasonable compensation, which is often minimal in comparison to the market price, to the patent holder.

⁴³ See Jishnu Guha, "Time for India's Intellectual Property Regime to Grow Up" (2005) 13 *Cardozo J. Int'l & Comp. L.* 225 at 253, referencing Tuan N. Samahon, "TRIPS Copyright Dispute Settlement after the Transition and Moratorium: Non-violation and Situation Complaints Against Developing Countries" (2000) 31 *Law & Pol'y Int'l Bus.* 1051 at 1066-67.

interests of nations) of the provisions as the number of participating nations increases. This thesis suggests that smaller international agreements, tending more to local interests, will likely generate greater success in the internationalization of patent law.

5. Approaching the internationalization of patent laws

5.1. Extraterritorialism in today's world

The majority of documented cases of extraterritorial applications of patent law involve the United States. There are several reasons for this. First, more economically developed jurisdictions are more likely to have highly developed intellectual property regimes, including necessary patent law infrastructures (e.g., a Patent Office and the ability to effectively enforce granted patent rights). Second, the extraterritorial application of patents is highly dependent on the economic bargaining power of the jurisdiction in question.⁴⁴ The United States, able to leverage its economic strength relative to other economies, has been the candidate for the study of this thesis. Other, albeit secondary, candidates include Canada and the European Union. While these candidate jurisdictions meet the aforementioned criteria, though to a lesser extent than the United States, they are also relevant for other reasons, primarily because they share large "information borders" – borders across which innovation is exchanged – with the United States.

⁴⁴ See Drahos, *supra* Ch. 1, note 16. Peter Drahos argues that the bilateral and multilateral agreements in recent decades have been pushed by developed countries and that the U.S. strong-armed other nations while negotiating TRIPS.

5.2. A place for self-determination in the internationalization of patent law

While globalization and the interests of patentees are generating considerable pressure for the international extension of patent rights and their recognition and enforcement through international treaties, one has to recognise that such treaties restrict the freedom of nations to regulate themselves. For instance, a country's subscription to bilateral or multilateral agreements usually imposes limits on the power of local government to shape its own laws. This lessening of territorial segmentation constitutes a loss of national sovereignty and identity. There can thus be a conflict between national identity and the movement towards the universal standardisation and harmonization of patent laws.

Just as the unilateral extraterritorial extension of patent policy can lead to the subjugation of national interests and policy choices (of foreign nations), so too can the over-uniformization of national regimes. A balance must be struck between the self-determination and internationalization of patent law.⁴⁵ As will be discussed below, this lends support to a more territorialistic approach that recognizes that there is a place for self-determination in international patent law.

5.3. Harmonisation of patent regimes versus territorialism in the age of globalisation

The line where patent infringement legally occurs is sometimes blurred, with numerous disputes arising between the patent holder and the user. Resolution through courts is often a very costly process. Further, as a result of globalizing markets,

⁴⁵ Graeme W. Austin, "Valuing 'Domestic Self-Determination' in International Intellectual Property Jurisprudence" (2002) 77 Chi.-Kent L. Rev. 1155. Austin is a proponent of the territorialistic approach to intellectual property rights.

international sales often extend to numerous countries. Whilst obtaining patents in multiple jurisdictions can already be prohibitive, the high costs and resources required to enforce patent rights in multiple jurisdictions brings into question the merit of seeking the patents in the first place. As a result, different routes have been explored with a view to extending patent rights internationally.

Some suggest that a harmonization-based approach is best for the future of international patent law. Donald Chisum argues that “the increasing interdependence of the global economy and the growing concern over the cost of multinational intellectual property rights procurement and enforcement [...] will make territorialism an unacceptable obstacle to international trade.”⁴⁶ He contends that the high cumulative costs of registering and maintaining patents internationally threatens to exclude “small, independent enterprises” from competing with larger, multinational corporations that are able to protect their intellectual capital more vigilantly.⁴⁷ Instead, Chisum proposes that patent regimes move towards more uniform administrative and judicial procedures in order to reduce costs.⁴⁸ Further, Adams supports the use of international organisations, such as the WTO, to resolve disputes on international infringements of patents since there are differing levels of economic and technological development among countries and domestic courts often lack the necessary competence to adjudicate such disputes.⁴⁹

Others maintain that while national variation is not necessarily beneficial to international patent law, the extraterritorial extension of domestic patent law is not the answer. Yu notes that emerging crosscurrents such as reciprocization, diversification,

⁴⁶ Chisum, *supra* Ch. 2, note 25 at 616.

⁴⁷ *Ibid.* at 618.

⁴⁸ *Ibid.* at 618.

⁴⁹ See Adams, *supra* note 41.

bilateralism, non-nationalization, and regime abandonment may undermine international harmonization efforts.⁵⁰ Curtis Bradley suggests that territoriality of patent law may indeed be necessary to its coordination internationally as long as the nation-state remains the principal actor in international relations.⁵¹ He also proposes that the need for patent rights to be covered across countries can be accommodated under territorialism through international treaties:

There are better ways to cope with global interdependence than judicial abandonment of territoriality. Where necessary, the political branches can protect U.S. interests by entering into international agreements, adjusting legislation and trade policy, and pursuing international dispute resolution. Even in the absence of such political branch action, the courts presently have the ability to adjudicate many instances of international infringement, through the use of well-accepted contributory infringement principles and the consideration of claims based on foreign intellectual property law. For these reasons, a territorial approach to intellectual property rights still has a place in our age of globalism.⁵²

Further, using territoriality as the basis for the extension of intellectual property rights through international agreements has the merit of accommodating the diversity of national economies as well as the diversity of intellectual property strategies.⁵³ Dinwoodie and Dreyfuss reject a monolithic view of intellectual property rights and

⁵⁰ Yu, *supra* Ch. 1, note 14 at 375 (“reciprocity provisions in national laws, demands for diversification by less developed countries, *bilateral and plurilateral agreements* pushed by developed countries, non-national systems created in response to Internet domain name disputes, and regime abandonment caused by the increasing use of mass market contracts, technological protection measures, and open source licensing”) [emphasis added].

⁵¹ Curtis A. Bradley, “Territorial Intellectual Property Rights in an Age of Globalism” (1997) 37 Va. J. Int’l L. 505 at 584.

⁵² *Ibid.* at 585.

⁵³ Graeme B. Dinwoodie & Rochelle C. Dreyfuss, “TRIPS and the Dynamics of Intellectual Property Lawmaking” (2004) 36 Case W. Res. J. Int’l L. 95 (arguing that “accommodating diversity of political economy as well as a diversity of substantive intellectual property strategies” strengthens the international system and promotes its credibility). See *supra* Section 5.2, supporting the notion that self-determination has a place in international patent law.

advocate a flexible approach to the national implementation of intellectual property norms in WTO member countries.⁵⁴

This territorial approach need not necessarily be inconsistent with the approach of this thesis: there is a strong need for the international protection of patent rights, but that this should be attended to by international treaty among nation states. From a practical viewpoint, presumably, negotiations among nation states are unlikely to reach a successful conclusion without some accommodation of the diversity of their individual national systems.

6. *Summary*

As discussed in Chapters 1 and 2, the U.S. patent tradition began in the eighteenth and nineteenth centuries with a presumption against the extraterritoriality of domestic patents, such that the exclusionary rights on the usage of the patented processes and products were confined to the domestic jurisdiction. However, a U.S. patentee could protect his rights by obtaining corresponding patents in other countries. This was often feasible in terms of cost in the eighteenth and nineteenth centuries for industrial products and processes because there were few countries with much of an industrial capacity. However, doing so is a costly process, which can become prohibitively expensive for many patentees if very many other countries have the capacity to use the patented knowledge. This is the case in the modern era when very many countries are

⁵⁴ Dinwoodie and Dreyfus further claim that permitting diverse national approaches enables “nation states to act as laboratories in the development of international rules; affording space for the self-determination of sovereign states encourages voluntary and ultimately more effective compliance with international norms”. Graeme B. Dinwoodie & Rochelle C. Dreyfuss, “International Intellectual Property Law and the Public Domain of Science” (2004) 7 J. Int’l Econ. L. 431 at 443.

industrialised and possess the capacity to effectively make use of the knowledge patented in other countries. The analysis in Chapter 3 demonstrated that, in the last few decades of the twentieth century, globalization and the shift in nature of patentable products to software and other information-based innovations increased the need for general mechanisms for the international protection of patent rights. Two of these mechanisms are the unilateral, extraterritorial application of patent laws of one nation upon another, which violates the sovereignty of the latter, and international treaties, which do not do so.

In the interests of maintaining international comity and mutual recognition of national intellectual property policy, governments need to abide by the policy choices of their foreign counterparts.⁵⁵ Unilateral, extraterritorial extensions of domestic patent law upon foreign regimes violate the principles of international law, and are often not sustainable. In an ideal world, international extensions of patent protection should be realized through a consensus-based approach, standardizing national patent regimes through international agreements. However, in practice, different nations have distinctive patent identities, such that global or near-global consensus on the standardization of patents is often difficult to achieve through a purely voluntary consensus. Instead, consensus on a bilateral or multilateral basis is more realistic.

Patent law is based on the idea that economic benefits to the patentee resulting from the exclusionary use of the patented processes and products encourage further inventions and innovations, which benefit the nation. Clearly, the larger the area over which the exclusionary rights of the patentees apply, the greater their economic incentives to innovate. Barring the unilateral imposition by a country of its patents on

⁵⁵ See Giordano-Coltart, *supra* note 32 at para. 33.

other countries, countries have an incentive to broaden the application of their patents to other countries through treaties and adherence to multinational organisations that ensure such protection. However, doing so often requires, in exchange, the acceptance of the patents rights of other countries to the domestic jurisdiction. In the modern world context, the United States is a dominant originator of patents, so that the interests of most other countries would be to not recognise U.S. patents so that their firms can engage in generic production based on U.S. patents. However, countries that do so may be denied entry to the world's largest market, which is that of the United States. Countries, therefore, often choose to enter patent treaties and obligations on the basis of a comprehensive package of benefits and costs.

As against the unilateral imposition of extraterritorial rights of patent rights by the legislature or courts of a country to other countries, treaties have the virtue of respecting the sovereignty of the countries accepting them.⁵⁶ The major international agreements on patents have been the *Paris Convention for the Protection of Industrial Property* and the WTO's *TRIPS Agreement*. Basically, these ensure, in ways specified by the treaty, the international extension of patents beyond the borders of the country in which they originated, without otherwise infringing the sovereignty of the member countries. Most countries of the world are now members of the WTO and accept its patent obligations. However, it is suggested that these initiatives do not adequately accommodate emerging technologies and a place for national autonomy in international lawmaking process.

There is a “global tilt” in new patents and the gains obtained from them. As between developed and developing countries, developed countries generate relatively

⁵⁶ This does assume that the countries enter the treaty of their own free will.

more patents, so that they tend to gain more from the extraterritorial extensions of patent rights to less developed countries, which generate relatively fewer patents. In fact, there could be a substantial potential loss to some of the less developed countries that do not have a substantial capacity to innovate and generate patents of their own but do have the capacity to produce goods utilising foreign patents.⁵⁷ Therefore, developed countries tend to benefit more from the patent provisions of the WTO than developing ones, some of which might even lose from subscribing to such provisions.⁵⁸

As discussed earlier in this chapter and in Chapter 3, the current age of globalization in which production can be based in any country and the shift in the nature of patentable products to physically elusive information-based technologies have generated an imperative for the recognition of patent rights internationally in order to compete in today's intellectual capital based economy. Since the unilateral extension of patent rights extraterritorially infringes on the sovereignty of other countries and poses inherent complications, rendering it unsustainable in the long-term, this thesis concludes that the extension of patent rights through bilateral or multilateral agreements is a more viable solution.

⁵⁷ A current illustration of this is the production of generic copies of patented drugs by Indian firms.

⁵⁸ However, as some developing countries learn from the utilisation of foreign products either in the production of generics or through licensing, they may build up their own innovative capacity and increase their own flow of patents.

Chapter 5

Summary & Conclusions

1. In brief

Knowledge and patentable information is less confined to geographic, national boundaries than ever before. This is in part due to globalization and the evolving nature of technology, particularly its increasingly transnational modality. The past half a century has seen a change from patent applications being predominantly for mechanical products and processes to covering information-based and digital technologies. These advancements have generated a need for technologies to be regulated across borders – that is, between patent jurisdictions. At issue is whether a country can enforce its own patent laws over activities occurring outside its territory, and if so, whether it should do so.

This thesis has argued that such an extraterritorial extension of domestic laws would disrupt the existing political and jurisdictional equilibrium, provoking consequences that could spill over into economic and foreign policy. This thesis asserted that there is a need for consistency among patent laws across international borders, that the extraterritorial application of patent laws does not promote this objective in the long-term, and that consistency among patent systems is best achieved via international agreements.

2. The need for consistency among patent laws internationally

2.1. The pre-modern period in the United States

During the period of the eighteenth and nineteenth centuries, the United States tended to generate less patentable innovations than Britain and some of the other European countries. Mutual recognition of each other's patents through treaties would have meant that

U.S. producers could not legally exploit matter patented in these other countries. It was therefore in the interest of the United States not to attempt the unilateral extension of its patents to other countries, since this might provoke a corresponding retaliation from other countries, or to seek a cooperative approach by entering into international treaties.

This interest was supported by the legal doctrine of the presumption against extraterritoriality. The rationale behind this presumption is that the extraterritorial application of domestic policy would impinge on the sovereignty of other nations, challenging conventional notions of domestic property regulation and the rule of law.¹ This tradition was maintained by the U.S. judiciary, as illustrated in the notable Supreme Court rulings of *Brown v. Duchesne* (1856) and *Deepsouth Packing Co. v. Laitram Corp.* (1972). Hence, the United States primarily maintained a territorial interpretation of patent rights from the writing of its Constitution to about the last quarter of the twentieth century.

However, towards the end of the nineteenth century, the United States was becoming increasingly industrially developed and generating a considerable number of patents of its own, as were many European nations. In such a context, the economic interests of these nations seemed to indicate benefits to them from some international recognition of each other's patent rights. An early attempt at the international standardization of patent laws occurred in 1883 with the establishment of the *Paris Convention for the Protection of Industrial Property*.

¹ Intellectual property rights are considered by many as "property-like" rights, in that they share similar characteristics to conventional property interests (i.e., personal and real property), including, *inter alia*, an aspect of ownership and exclusivity of use. Under this view, it is believed that such rights warrant a similarly domestic treatment as conventional property. However, many criticize this association since intellectual property rights are more limited than physical property (e.g., in duration of the exclusive right). Further, intellectual property is not perceived as sharing the same natural scarcity as physical property as it can be duplicated indefinitely.

2.2. *The modern period in the United States*

The United States' industrial development during the first half of the twentieth century resulted in the U.S. generating more patents by its residents than any other country, especially after the Second World War. This implies that the economic interests of the United States in its patent relations with other countries shifted to extending its patent monopolies to foreign countries, even if it had to offer in exchange recognition of their relatively smaller number of patents. This shift resulted in a major push by the United States, and other developed nations, to arrange for the mutual recognition of each other's patents. This push culminated in the WTO's *TRIPS Agreement* to which all member countries of the WTO must subscribe. The agreement sets forth minimum standards of protection, procedures and remedies for enforcement of intellectual property rights, and dispute settlement procedures.

However, the agreement mandates only *minimum* standards, which in addition to the existence of escape clauses allowing non-conformity, means that the WTO does not ensure the complete, let alone a substantial, harmonization of patent laws. There does not yet exist an organized, international regime for the enforcement of national patents outside their jurisdiction, though there have been calls for such adjudication by international organisations.² These issues will be an agenda for WTO members to address in the future. However, given the disparity amongst national patent policies, it is doubtful that such harmonization will be achieved in the near future.

² See Adams, *supra* Ch. 4, note 41 (recommending that international organizations (e.g., WTO), and not domestic courts, are best suited to resolve tensions between "commercial rights holders, putative infringers and the interests of states with varying levels of economic and technological capacity" on the basis that domestic courts lack the necessary institutional competence to adjudicate such international tensions).

2.3. The evolution of patentable subject-matter

In addition to a shifting economic focus, advancements in patentable subject-matter have also prompted the need for the internationalization of patent laws. The last few decades have seen a change in the nature of patentable products from mechanical devices to information-based inventions. These technologies, such as software, have several unique characteristics differentiating them from most other patentable technologies. Their intangible nature allows for a distinction between the locality of an invention and the locality of its use such that the operation and use of an invention can straddle patent jurisdictions. This is furthered by advancements in the fields of communications and transport, primarily attributable to globalization, that allow for such technologies to be transmitted more rapidly and at a lower cost than conventional inventions. Such technological characteristics challenge conventional notions of territorialism, and as such cannot be adequately protected under domestic intellectual property schemes alone. Rather, some form of international coverage of patented technologies must be sought to complement domestic patent protection. Further, in order for such international coverage to be effective, a level of uniformity amongst national patent policies is required.

2.4. The extraterritorial effect of U.S. patent laws

Despite a constitutionally-based presumption against the extraterritorial application of domestic laws, in 1984, the U.S. Congress enacted legislation that allowed for the assumption of jurisdiction over foreign activities. The enactment of 35 U.S.C. 271(f) was meant to prevent manufacturers from avoiding domestic patent laws by simply completing a final assembly step outside the United States. However, the effect of the provision is to

regulate activities occurring outside U.S. territorial boundaries and within the lawful jurisdiction of foreign patent regimes.

Chapter 3 examined three recent landmark court decisions that broached the issue of the extraterritorialism of U.S. patent law in the context of software and information-based innovations. Included in this examination were the 2005 pro-extraterritorial rulings of the Court of Appeals for the Federal Circuit in *Eolas*, *RIM*, and *AT&T (Fed. Cir.)*. In *Eolas Techs. v. Microsoft Corp.*, instances of foreign infringement were judged to be included in the determination of damage awards under s. 271(f). This constituted an extraterritorial extension of U.S. patent law, and ran contrary to the presumption against such extension, which had been applied by the courts earlier in U.S. history. Similar logic was applied by the Federal Circuit in *AT&T Corp. v. Microsoft Corp.*, ruling that the export of component software fell subject to s. 271(f) despite being replicated abroad before being incorporated into the final product. The extraterritoriality conundrum was reencountered in *NTP v. Research in Motion* over the provision and use of a patented mobile email service that spanned international borders. Again, the Federal Circuit broadened the geographic scope of U.S. patent laws through the adoption of a control and beneficial use test. At the time, these three rulings provided a clear progression towards the expansion of U.S. patent laws internationally.

This extraterritorial progression remained unchecked until the Supreme Court's reversal of *AT&T Corp. v. Microsoft Corp.* in early 2007. Preferring a narrow interpretation to s. 271(f), the Court held that the foreign replication of software before it was integrated into the purportedly infringing invention was sufficient to bring it outside the reach of domestic patent laws. While the decision indicates a significant change in U.S. patent

policy, the decision has only restrained the extraterritorial assertion of U.S. patent law with regards to software and information-based technologies.

The contrast between the approach taken by the Federal Circuit for the U.S. Court of Appeals, whose rulings in *Eolas*, *RIM*, and *AT&T*, sought the extraterritorial extension of U.S. patent rights, and the Supreme Court, which has consistently favoured a territorialistic approach, is an interesting one. The Federal Circuit is considered to be a specialized court in light of its exclusive jurisdiction over patent disputes whilst the Supreme Court is a general court.³ Some may argue that, in light of its expertise in adjudicating patent cases, the Federal Circuit is in a better position to implement national patent policy as intended by the legislature.⁴ The counter-position would be that the Supreme Court may better gauge restrictions upon the country's patent policy in accordance with other aspects of economic and foreign policy (e.g., trade considerations). While it is unlikely that such considerations will directly arise in future judicial decisions in the United States, they may play a factor in the decision of other regimes considering whether to employ a similar patent policy.

3. The conflict between territorialism and extraterritorialism

On the one hand, the economic interests of patent holders are promoted in extending their patent rights over as wide a geographical area as possible. As previously discussed, this

³ See generally Rochelle C. Dreyfuss, "The Federal Circuit: A Case Study in Specialized Courts" (1989) 64 N.Y.U. L. Rev. 1.

⁴ See Mark D. Janis, "Patent Law in the Age of the Invisible Supreme Court," 2001 University of Illinois Law Review 387 (advocating that the Supreme Court should adopt a managerial role regarding disputes over the appropriate allocation of power among patent system institutions and rejecting the proposition that the Court should intervene in patent cases to correct perceived substantive errors in Federal Circuit decisions).

extraterritorialistic trend was seen in U.S. patent policy post-1984, through the enactment and judicial interpretation of s. 271(f) and related infringement provisions.

On the other hand, the overlapping of exclusive patent rights over the same subject-matter in a confined territorial jurisdiction poses a conflict of laws. Under international law, a state possesses exclusive sovereignty and jurisdiction within its own territory. The extraterritorial encroachment by one state upon another can potentially disrupt the ability of the impinged nation to regulate its own affairs, generating disparity between patent systems internationally. This is the foundation of the territorial approach, which seeks to accommodate the economic interests of nations whilst respecting the sovereign authority of other nations to regulate their own intellectual capital. This thesis argues that the territorial approach is best accommodated through international treaties.

4. The case for international agreements

The ability of a nation to tailor its domestic policy to national interests is a critical facet to the sovereignty dogma. As explained above, the latter ability is greatly affected by the exercise of foreign patent policy over activities occurring domestically. For instance, such an incursion affects the dynamics of both domestic and international competition as the size and geographic scope of markets are altered. This thesis suggests that instead of applying an extraterritorialistic approach, which inevitably leads to the subjugation of one nation's policy interests to those of another nation, international patent law would be better served through accession to international agreements that set forth provisions on the mutual recognition and enforcement of foreign patents among member states.

However, the adoption of standardized, international norms into domestic regimes also diminishes domestic self-determination to some extent.⁵ For instance, some countries may prefer to regulate certain industries and technologies at different levels of protection (e.g., agricultural innovations relative to pharmaceuticals).⁶ Standardized norms may prevent them from executing policy geared towards specifically accommodating national interests. Nonetheless, in comparison to the general international harmonization of patent laws which, in principle, regards all national interests as being similar, bilateral and even some multilateral agreements are more likely to be effective at catering to national interests.⁷ In turn, the diminishing effect on domestic self-determination is minimized.

5. Future considerations

The literature has suggested several initiatives that the international community could pursue in the future. These include the reconsideration of the current breadth of patentable subject-matter, including delineating the scope and application of different types of intellectual property (e.g., patents, copyright, etc.) with regards to particular types of subject-matter.

On the adjudication of disputes regarding the infringement of patent rights, it has been argued that international organisations, such as the WTO, are preferable to domestic courts, since the latter often do not possess the necessary competence to balance international tensions. Further, in the absence of universal standards, unilateral efforts by

⁵ See *supra* Ch. 4, section 5.2.

⁶ Yu, *supra* Ch. 1, note 14 at 432-33.

⁷ See *supra* Ch. 4, section 5.3.

domestic courts tend to reach inconsistent results such that domestic innovators are either “over-compensated or under-compensated relative to foreign imitators.”⁸

Both of these initiatives complement the approaches set forth in this thesis and would likely benefit international patent law in the long-term.

⁸ See Adams, *supra* Ch. 4, note 41 at 130.

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