

# **THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS: FOUR LEARNT LESSONS AND FOUR THESES**

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## **Abstract**

Intellectual Property Rights (IPRs) have become ubiquitous in the current debate and have emerged as the key issue of global innovation policy. The ‘Trade Related Aspects of Intellectual Property Rights’ (TRIPS), signed on 1994 as a founding element of the World Trade Organization, represent the most important attempt to establish a global harmonization of Intellectual Property protection. The aim of this paper is to critically re-examine what has become the common wisdom around IPRs, TRIPS and their effects. We argue that supporters of IPRs in the Western corporations and governments as well as detractors in global movements and developing countries have both over-estimated their importance in the process of generation and diffusion of knowledge and innovation. On the basis of some key learnt lessons on the nature of innovation and technological change, we assess four theses about TRIPS and their impact on the global generation and distribution of knowledge. The policy implications concerning international organizations and technological transfer are finally discussed.

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## BULLETPPOINTS For Summary

- Intellectual Property Rights (IPRs) have emerged as the key issue of global innovation policy: through the 'Trade Related Aspects of Intellectual Property Rights agreement' (TRIPS), there is an attempt to impose worldwide a Western system of IPRs.
- Western governments and large corporations claim that strong IPRs are needed to maintain investment in innovation. This position is contrasted by new political and social movements, which assert that muscular IPRs enforcement hampers economic growth and welfare in developing countries. The article argues that both positions overemphasise what IPRs can actually do to promote or obstruct innovation.
- IPRs *per se* do not allow companies to appropriate the returns from their innovations unless they are matched to a wide ranging strategy which includes continuous learning and dynamic innovation.
- There are substantial cross-industry differences in the role played by IPRs: while patents are rather significant in pharmaceuticals and copyright is important in the audiovisual industry, the majority of sectors are not seriously affected by neither strong nor weak IPR regimes.
- In order to catch up, developing countries should put specific policies in place to nurture their absorptive capacity through the creation of appropriate infrastructure and human resources. Competence building is not hampered by IPRs. Developing countries should concentrate in active learning policies to acquire the knowledge of the most industrialized nations.
- Western nations would better protect their wellbeing by focusing on promoting new knowledge and creativity rather than by impeding to new entrants to access the know-how they have already generated.

## 1. INTRODUCTION

Intellectual Property Rights (IPRs) have become ubiquitous in the economic debate: the front pages of newspapers continuously report of major controversies among corporations, governments and advocacy groups. News such as the copyright issue of the Google Books project and the power of the Big Pharma's patents over key drugs and vaccines have generated growing alarms and heated disputes. Some books, including Naomi Klein's *No Logo* and Vandana Shiva's *Patents: Myth and Reality* have become best-sellers. Science fiction has been quick to report these concerns, as shown by Michael Crichton's *Next*. National Parliaments, the European Union (EU) and the North Atlantic Free Trade Association (NAFTA) are repeatedly addressing the issue. A brand new Pirate Party, whose main political goal is to get free access to software and copyrighted products, has even managed to elect its own deputies at the European Parliament. Above all, IPRs have become one of the core businesses of the World Trade Organization (WTO). In a word, IPRs have emerged as the key issue of global innovation policy.

The 'Trade Related Aspects of Intellectual Property Rights' (TRIPS), signed on 1994, are a founding element of the WTO. TRIPS are the most important attempt to establish a global harmonization of Intellectual Property (IP) protection and enforcement putting international standards for the protection of patents, copyrights, trademarks, and design. They also provide a dispute settlement schema and establish enforcement procedures at the intergovernmental level. Not surprisingly, TRIPS have been highly debated by political scientists (May, 2002a; Ryan, 1998; Sell, 2003) and economists (Maskus, 2000; Maskus and Reichman, 2005 among the others). But TRIPS have been debated also outside academe and have been vigorously opposed by non-governmental organizations and global movements (Drahos and Mayne, 2002).

The aim of this paper is to critically re-examine what has become the common wisdom around IPRs, TRIPS and their effects. We argue that there has been an overestimation of the importance of IPRs in the process of generation and diffusion of knowledge and innovation. For both developed and developing countries, the key issue should be an active innovation and learning policy rather than the protection through IPRs of the already available knowledge. The debate has instead been twisted on IPRs as such rather than on knowledge generation and diffusion also because some key learnt lessons on the nature of innovation and technological change have not been duly taken into account. On the basis of these learnt lessons, we will assert four theses about TRIPS.

This article will mainly focus on patents, while it will deal less with copyright and other IPRs (for a comprehensive collection of essays on this issue see Hess and Ostrom, 2006; see also Macmillan, 2006 for a focus on copyrights). In the next section we provide the rationale behind the establishment of the IPRs systems across modern societies. Section three presents four learnt lessons which emerge from the literature of the economics of innovation and technological change. In section four we present four main theses on the globalization of the IPRs and their effects on the global generation and distribution of knowledge. The last section discusses the policy implications.

## 2. THE FAUSTIAN BARGAIN AND THE RATIONALE FOR INTELLECTUAL PROPERTY RIGHTS

The modern patent system, based on the objective assessment of the inventions, was introduced by the Venetian Republic in 1474 (May, 2002b). The two requirements indicated by the Venetian Republic - the usefulness and the novelty of the invention - are still in vigour today in all states. As in a Faustian bargain, the inventor and the government undertake a long term pact: the inventor commits herself to disclose all information of her invention, while the government guarantees that it

will provide legal protection to give exclusive rights on the economic returns of the invention (for a history of IPRs, see May and Sell, 2006).<sup>1</sup>

IPRs have substantially evolved over the centuries but the Faustian bargain has remained unchanged. By providing *intellectual* property rights, the government assures the inventor the right to exclude others from using the outcome of her creative activities without her authorization. Thus the government gives the inventor a legal monopoly to exploit her invention and capture the economic benefits for a limited period of time. Legislation is far from uniform: for copyright the disclosure is complete by the moment you publish a book or a film, while inventions generally have to pass a merit exam before to be granted a patent. As it happens with many deals, also this one is hardly fully implemented and the inventor often tries to hide as much as possible about her invention, while the government is not in the position to assure full appropriation of the returns of the invention.

Through this deal, the government manages to disclosing information on the already generated knowledge, and perhaps more importantly it provides an incentive to individuals to invest their time and resources in creative activities. Creative activities are in fact time-consuming and costly while it is always uncertain if they will produce something that generates economic returns. Once the inventor has discovered a new device or a musician written a new symphony, it becomes easy for others to exploit their outcomes at very low costs. Without legal protection, inventors and authors are not in the condition to fully exploit their works and appropriate the economic returns. As a results, in absence of public regulation, there would be an under investment in creative activities with respect to a social desirable level.

An IPR regime can be defined as the written and customary rules that apply within a specific political community. In some countries, the government enforces strong protection of IPRs and the holders are guaranteed that the infringements will be persecuted by the law and compensation will be obtained. These are the strong IPRs regimes. In other countries, the IPRs regime is much weaker and there is much less public interest to enforce IPRs. Policing violation is much more relaxed and courts are slow and/or permissive towards infringement.

### **3. WHAT WE HAVE LEARNED ABOUT KNOWLEDGE AND INNOVATION: FOUR LEARNT LESSONS**

Scholars in the field of innovation have been largely exploring the mechanism which lies at the hearth of the creation and diffusion of knowledge and innovation, as well as the mechanism technological change. In this section we will briefly outline four learnt lessons derived from this body of literature which are relevant to assess the current IPRs controversy.

***Lesson 1: Knowledge is not information. Successful knowledge transfer is not only a matter of transferring information, but it requires learning trough acquiring a wide range of competences, skills and tacit knowledge.***

There is a basic distinction between *information* and *knowledge*. Information is a good which is costly to produce but by the moment it becomes public can be appropriated and transmitted at very low costs. Since all the costs are on the shoulders of the producers of information and there is no cost on the users, the lack of institutional protection would likely lead to an under-investment in these activities (Arrow, 1962). But can the outcomes of the creative and innovative activities for which intellectual property is requested be considered information? The Schumpeterian tradition argues that creative and innovative activities are the product of human knowledge, which cannot be transferred to potential users unless they are willing to invest efforts and time in learning.

Knowledge is therefore rather different from information since no user will be in the position to get economic advantages from it without an active learning effort and creative adaptive processes (Nelson and Winter, 1982, p. 60; Pavitt, 1987).

But this is not the full part of the story. There is another important aspect that makes the transfer of knowledge difficult to achieve: not all knowledge can be properly codified. An important component of knowledge is *tacit* (Polanyi, 1966) and not even those who have generated it are able to properly articulate it in manuals, blue-prints, patents or other 'codes'. A good cook is not necessarily able to transfer all his knowledge in a book of receipts. We are dealing with tacit knowledge when 'we know more than what we can tell' (Polanyi, 1967). In order to transfer tacit knowledge to an apprentice, the coded component should be complemented with experimentation and training. A key characteristic of IPRs is that they can protect the codified knowledge but not the tacit one.

The picture is therefore more complex than it can appear in the first instance. On the one hand, the producers of knowledge have a wider battery of instruments to profit from it, ranging from selling the codified component through the IPRs system to transferring it through direct contact (for example through teaching programmes, technical cooperation, and so on). On the other hand, those willing to acquire knowledge should also invest their resources not just to buy IPRs, but also to get the infrastructures and the skills that make it possible to actually use knowledge for economic purposes.

***Lesson 2: Without imitating it is impossible to learn and innovate. The development of emerging economies is associated to creative imitation and absorption.***

Once Pablo Picasso stated that 'good artists copy, great artists steal'. This also applies to knowledge generation: innovation cannot be created in a vacuum but rather is bred in an environment of creative imitation. In the XIX century, Germany and the United States benefited from the knowledge developed in the United Kingdom. In the second half of the XX century, all countries that successfully managed to catch up, including Japan, South Korea, Singapore and Taiwan, undertook a process of continuous adoption and imitation of technologies developed abroad. Today, China, India and Brazil, among others, are acquiring the knowledge developed in the OECD countries. Every 'emerging economy' at some point of its history has relied on the adoption of foreign technologies.<sup>2</sup> Technology transfer is a multidimensional phenomenon and to be effective it should pay attention to the features of the host countries, including its stage of development, the economic and industrial base, the characteristics of the institutions and last and not least the IPRs regime.

There is not a single channel that guarantees successful technology and knowledge transfer. On the contrary, each knowledge domain requires activating a variety of interconnected channels, including: i. Foreign direct investments, since the branches of multinational corporations in host countries often provide the most straightforward way to assimilate production methods of other countries; ii. Joint-ventures and strategic alliances, which allow companies of different countries to combine their skills, resources and expertise; iii. Technology licensing, which includes not just the acquisition of IPRs but also technical assistance and training; iv. Technology embodied in imports, especially in the case of capital goods and equipment.

***Lesson 3: Knowledge is not about plug-and-play. To adopt foreign technology is a costly activity requiring a big deliberate domestic effort.***

The availability of scientific knowledge and technology from abroad is only part of the story, but it is not as such sufficient to foster development driven by technological change. The other part of the story is the endogenous effort that catching up countries should be willing to undertake. In order to make sense and exploit the spectrum of knowledge, competences and technologies coming from abroad, each country needs to develop an 'absorptive capacity', i.e. the endogenous capacity to learn from these opportunities and to exploit them economically (Cohen and Levinthal, 1990; 1989). This recalls that learning is not a fully passive process. Countries need to monitor the advances occurring abroad, to create internal competences able to adopt foreign technologies and put in place specific measures to encourage their diffusion in the whole economy.

Creating such an environment requires a comprehensive effort ranging from public policies, education and human resources, a reliable legislative system and institutions, incentives and trade policies, sometimes referred as *developmental state*.<sup>3</sup> In the second half of the XX century, Western technology was equally available to Latin American and to East Asian countries, but the latter countries only have managed to acquire it up to the point to be able to compete on a par, mostly because of the active learning policies implemented (Wong, 2004; Woo-Cumings, 1999).

National R&D investment to absorb foreign technology has been a crucial enabling factor for the US economic growth during the 1900-1946 period (Mowery and Rosenberg, 1989) and for the Japanese reconstruction during the post war period (Morishima, 1982). This is often associated to the activities carried out by both the business and the public sectors. Firms in the catching up countries need to invest in R&D, capital goods, equipment and infrastructures to develop the appropriate knowledge and capabilities to adopt foreign knowledge (Freeman, 1987; Hou and San, 1993; Mowery and Oxley, 1997; Westphal et al., 1985). In turn governments need to implement dedicated policies to foster public R&D and education as well as to support trade and foreign direct investment (Bell and Pavitt, 1997). Countries that succeeded in catching up relied on combination of devices to acquire foreign technology with policies aimed at building competences and skills internally.

***Lesson 4: The ways to profit from innovation are infinite. IPRs are only one of the several tools in firms' competition and are effective in a few industries only.***

Innovation is one of the most heterogeneous economic activities. A hair pin and a song, a jet engine and a statistical method, a drug and a machine tool could all be innovations. The heterogeneous nature of the phenomenon is equally reflected in the sources and methods employed to appropriate the returns provided by innovation activities. The methods to guarantee the returns of innovations change considerably across industries, markets and countries, and also evolve over time. The most effective way to appropriate the returns of innovation is by combining a battery of different strategies (Teece, 1986).

The methods used by firms to appropriate returns from their innovations can be broadly divided into two large categories. The first category comprises the legal methods associated to IPRs. The second category is represented by other economic methods, which include industrial secrecy, lead time, differentiation, and market distribution. The relative importance of the two categories considerably varies across technologies and industries. But a wealth of empirical studies has consistently shown that IPRs alone cannot guarantee alone the full appropriation of innovations.<sup>4</sup> On the ground of in-depth statistical surveys carried out at the firm level, it emerges that patents, the most important and controversial component in the IPRs family, are very important in one industry only, the pharmaceutical, and, to a lesser extent, the chemical. But patents are not a key competitive factor in other high tech industries such as electronics, telecommunication, motor vehicles and machinery. In some high tech industries such as aerospace and nuclear energy, patents are not important at all

since industrial secrecy is much more relevant. Profit seeking firms implement other strategies to exploit innovation including lead time, moving down the learning curve, sales and service efforts and secrecy. In the computer industry firms are increasingly relying on new forms of IPRs such as the GNU General Public License (GPL) for the development of the so-called *open source* software. Contrary to the traditional IPRs logic, the GPL allows anyone to use and modify the software. As a result, we have witness over the last decade the emerging of new business models in this industry which allow firms to profit relying on new strategies based on combinations of ‘traditional’ and new forms of IPRs (Chesbrough, 2003; Lerner and Tirole, 2002; Tapscott and Williams, 2006). Other significant differences emerge according to the individual characteristics of new technologies and, as expected, patents are better able to protect product rather than process innovations.

This does not necessarily imply that firms consider patents useless: otherwise it would be difficult to explain why firms bother to file, apply and pay for several hundred thousands patents every year. But even when they have a substantial patent portfolio, firms declare that they are not able to profit from them unless they combine the legal protection with other economic instruments of appropriation.

While there is abundant evidence on the manufacturing industry and on the patent system, there is less evidence on the appropriability system in the service industry and on the copyright (for a significant exception, see Blind et al., 2003). But the available evidence suggests that manufacturing and services on the one hand, and patents and copyrights on the other hand, have several similarities. A few industries strongly rely on copyright and are damaged by copyright infringement. The cartoon films, for example, appear to rely on strong copyright systems as much as the pharmaceutical industry relies on patents. But copyright enforcement alone cannot guarantee the full appropriation of the returns unless it is combined with other economic instruments. Similarly, in the industrial design sector, firms do not rely so much on the effectiveness of the design registration as a means to protect their new products (Filippetti, 2009).

The innovator’s perspective is rather specular to the imitator’s. Strong regimes of IPRs make imitation slightly more costly and slower but not impossible since there is often the possibility to ‘invent around’, namely a set of activities through which a competitor can produce an effective functional substitute for the product protected by IPRs without infringing its legal rights. On the contrary, weak regimes of IPRs make imitation cheaper and faster. But prospective imitators need to acquire a wide range of expertise that can be done through a substantial investment in building the knowledge base requested.

## Box 1 – What has the economics of innovation to say about knowledge and Intellectual Property Rights?

*Lesson 1:* To consider knowledge as information, as often done in the debate on IPRs, leads to wrong analyses and policies. The acquisition of knowledge requires that both the teacher and the learner are willing to devote time, resources and efforts to acquire it. This makes the mechanisms of knowledge transmission more complex than those related to information.

*Lesson 2:* Any innovative process is based also on creative imitation and copying. There is no country that has managed to catch up without relying on the knowledge base of other and more developed countries. A conceptual separation between “innovators” and “imitators” is therefore wrong since good innovators build up on the state of the art and good imitators need to improve to imitate and adopt others’ innovations

*Lesson 3:* To take advantage from foreign technologies, developing countries should put in place explicit policies to create adequate absorptive capacity in terms of endogenous competences, skills, infrastructures and institutions.

*Lesson 4:* IPRs are just one of the channels used by companies to appropriate the returns from their innovations. There are cross-industry differences in the effectiveness of IPRs and while Pharmaceuticals is heavily dependent on patents and Children’s films are heavily dependent on copyrights, in the majority of industries IPRs are of moderate importance. Moreover, IPRs are much more effective if combined with wider companies’ strategies which include continuous learning and innovation.

### 4. FOUR THESES ON THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS

On the ground of the learnt lessons summarized above, how can we interpret the current controversy on the global regime of IPRs and, in particular, TRIPS? We affirm in this section four theses which somehow put in a different context several of what has become the traditional wisdom.

#### ***First Thesis: TRIPS aim at imposing the Western and broken IP regime to the rest of the world***

*A Silent Revolution in IPRs started in the United States.* – Over the last few decades, the United States have introduced several institutional changes that strengthened the IPRs regime. These changes have generated greater penalties for IPRs infringement, have allowed intellectual property also for publicly funded R&D and have enlarged the scope of patents to unexpected areas: in a nutshell they have introduced a ‘silent revolution’ (Andersen, 2004; Jaffe and Lerner, 2004). To detail:

- The establishment of a centralized appellate court for patents, the so called ‘The Patent Court’, in 1992. This Court represents the change towards a pro-patent era after a long period of weak patents. Data on patent litigations show that the Patent Court has taken the direction of strengthening patent-holder’ rights (Gallini, 2002; Jaffe and Lerner, 2004).
- The Bayh-Dole Act approved in the United States in 1980 to facilitate the commercialization of inventions developed in the public sector, allowing universities and other publicly funded institutions to grant patents and exclusive license the results of research contracts funded by Federal agency. Through the Bayh-Dole Act, also the publicly funded R&D has become privately exploitable. Several other OECD countries have imitated the Bayh-Dole act and introduced similar legislation (for an assessment, see Mowery and Sampat, 2004) .

- The possibility to get the protection of patents has been broadened to activities that were not previously eligible. Often patents have been granted to inventions that do not seem to be particularly useful, such as devices to ‘measuring breasts with a tape to determine bra size’, or ‘executing a tennis stroke while wearing a knee pad’ (Gleick, 2003). But the scope of the patent protection has also been allowed in key sectors such as software, business methods, statistical methods, genes, plant genetics, micro-organisms and so on. This is implementing what the US Supreme Court already advocated in 1980: ‘anything under the sun that is made by men’ should be worthy of patent protection (Jaffe and Lerner, 2004). Further, patents are now granted also for discoveries that are very close to ‘life’: about forty thousand DNA-related patents have been granted (Heller, 2008, p. 50).

*Is the West IP system broken?* - Although they have not been replicated to the same extent in Europe and Japan, the stronger regime of IPRs emerged in the USA has become a model for other continents. But this model is far from satisfactory. Three main kinds of criticisms have been made.

- A growing attention has been provided towards the so-called ‘tragedy of the anti-commons’. Long ago, it was argued that a lack of property rights may destroy private incentives to maintain and upgrade public goods (Hardin, 1968). However, too much ownership may have the opposite effect and in the realm of knowledge may impede the circulation of information and impede innovation (Hardin, 1968; Heller, 2008; Heller and Eisenberg, 1998). This is particularly manifest in those industries in which innovation rely on systemic technology and integrated knowledge (i.e. biotechnology, computer, and telecommunication). IPRs are increasingly moving deeper to cover data and facts which represent the basic ingredients of the scientific practise and research (Boyle, 2003; David, 2000). The proprietary structure of this kind of knowledge could seriously hamper the scientific advancement.
- Because of the new legislation, firms have developed a propensity to patent more in order to take hostage as many technologies they can to hamper other firms technological advancement and to avoid being blocked themselves (Hall and Ziedonis, 2001; Ziedonis, 2004). Rather than promoting innovation, they are restricting innovative capacity to a few incumbent firms.
- Eventually, the current rules fail to provide predictable property and produces costly disputes and excessive litigation that outweigh positive incentives and profits stemming from innovative activities (Bessen and Meurer, 2008; Jaffe and Lerner, 2004). As John Barton argued ‘the number of intellectual property lawyers in the US is growing faster than the amount of researchers’ (Barton, 2000). Instead of promoting innovation, IPRs are diverting resources from innovation.

*Are TRIPS the imposition of a rotten IP regime to the developing world?* - TRIPS have become one of the most controversial issues not only in academe, but also in the political arena. Civil activists, NGOs and the public opinion in general have fiercely denounced TRIPS as a colonialist act imposing the Western standard of the IPRs system to the rest of the world (Shiva, 2001). In fact, TRIPS are the key instrument to enlarge outside the West the ‘silent revolution’ in IPRs.

The TRIPS Agreement strengthened previous standards by mandating enforcement in all member countries and by reforming the Dispute Settlement procedures within the WTO. Art. 4 of the TRIPS Agreement applies a cornerstone of the global trade policy, the so-called Most Favoured Nation clause, to the IPRs (World Trade Organization, 2009b).<sup>5</sup> Article 10 allows the copyright protection of software and datasets, and fixes the term of protection to no less than 50 years. Article 33 establishes that the protection of patents shall not end before 20 years. Article 35 requires Member countries to protect the layout-designs of integrated circuits in accordance with the provisions of the Treaty on Intellectual Property in Respect of Integrated Circuits, negotiated under the auspices of World International Property Organization (WIPO) in 1989. Part three of the TRIPS Agreement is dedicated to the enforcements of IPRs, and art. 61 requires that Members should provide civil as

well as criminal remedies for the infringement of IPRs. This implies that all WTO members should develop or modernize their judicial systems and enforcement procedures to comply with TRIPS (World Trade Organization, 2009b).

Through TRIPS, the IP systems of the most advanced countries is therefore exported from developed to developing countries, from countries that invest massively in R&D and innovation to countries with limited resources and infrastructures, from net high tech exporters to net importers. Before the TRIPS most of the developing countries did not extend protection to emerging technologies such as software, integrated circuits and electronic database, nor allowed IP to plant varieties. One of the most controversial issues has been the possibility to patent in pharmaceuticals, an industry to which TRIPS dedicate a special attention (Lanoszka, 2003). India, Brazil, Argentina, Mexico and several other countries had a weak IP protection on drugs which allowed the development of a generic drug national industry that is now incompatible with TRIPS.

Regarding the enforcement and dispute settlement provisions, TRIPS introduces a fundamental novelty with respect to the previous international setting. Both the Paris Convention for the protection of industrial property and the Berne Convention for the protection of artistic and literary property provided no effective procedures for settling IPRs disputes. TRIPS have dramatically changed this state of affairs by linking IPRs to international trade allowing advanced countries to further increase their bargaining power in the WTO. This assures a more effective enforcement and the possibility to using trade provisions, such as tariffs and quotas, to punish the rule-breaking countries. Table 1 shows the disputes within the WTO concerning TRIPS. This ‘who is suing whom’ table shows that the US have the lion’s share of the disputes.

Table 1 Who is suing whom? Disputes cases related to TRIPS and TRIPS enforcement

		Sued country													Total
		USA	EC	Argentina	Brazil	Canada	Denmark	Greece	India	Ireland	Pakistan	Portugal	Sweden	Japan	
Complainant	USA	n.a.	5	2	1	1	2	2	1	1	1	1	2	1	20
	EC	3	n.a.			1			1					1	6
	Australia		1												1
	Brazil	1			n.a.										1
	Canada		1			n.a.									1
	Total	4	7	2	1	2	2	2	2	1	1	1	2	2	29

Source: authors’ elaboration on WTO data (World Trade Organization, 2009a).

The harmonisation of IPRs introduced by the TRIPS Agreement has led to a race to the top which is certainly not advantageous to countries willing to catch up also by acquiring the expertise, knowledge and innovations of the leaders (Chang, 2003). Moreover, for most of the WTO Members, TRIPS are an exogenous introduction of rules and standards. It is somehow surprising that this expansion of Western standards occurred in a moment in which the usefulness of IPRs as a method to foster innovation and knowledge development is seriously challenged also in the West. Why has this happened? In the next section we will show how a few corporations succeeded to persuade more than 100 countries, most of them being net importers of technology, to ‘approve’ the most important revolution in the global IPRs.

***Second Thesis: TRIPS are the outcome of a non democratic process driven by a club of US corporations***

A club of US multinational corporations played a major role in getting TRIPS Agreement providing one of the most important lessons on how business power shapes international politics (Ryan, 1998; Sell, 2003). However, this should not be necessarily seen as a sign of strength of the American economy, but rather as the consequence of the progressive erosion of the US technological

hegemony. Already at the beginning of the 1980s the US supremacy in high tech trade came to a showdown because of the impressive growth of Japan and, to a lesser extent, of Europe (Nelson and Wright, 1992; Pianta, 1988; Rosenberg and Steinmueller, 1988).

The US trade policy underwent by the mid-1980s to a major shift in response to their threatened technological world hegemony. Beginning in the early 1980s, annual trade deficit reached unprecedented levels. The US trade deficit topped 100 billion dollars in 1984 and peaked the record of 153 billions dollars in 1987 (US Department of Commerce, 2009). Linking the loss of market shares to IP infringement by other countries could provide an explanation for the former and a policy action for the latter. The US corporations hoped to find a remedy to their lack of competitiveness by making IPRs stronger in their abroad markets. By mid 1980s the US administration began to encompass its pro-IPRs silent revolution also in international affairs. This was justified by the feeling that free trade was not any more *fair* trade, since a substantial part of the R&D and innovative investments financed by American corporations were appropriated without payment by competing firms in other countries. As the former assistant general counsel of the United States Trade Representative (USTR) said ‘Our companies find that they must compete with the unauthorized copies not only in the source country but in third countries as well’ (cited in Sell, 2003, p. 81).

In a more integrated global trade regime, in which high tech industries were becoming the crucial factor of competitiveness, the fact that other countries had a more permissive regime of IP was perceived as one of the causes of the US trade deficit. As the assistant secretary of commerce argued, ‘there is a widespread bipartisan agreement that the protection of intellectual property worldwide is a critically important factor in expanding trade in high technology products’ (cited in Sell, 2003 p. 83). The link between trade and IPRs was formally established in 1984 in the Trade and Tariff Act in which, under Section 301, IP protection became a motive to assessing other countries eligibility for non-reciprocal trade concession.<sup>6</sup>

From 1984 until the signing of the TRIPS Agreement of 1994 the USTR played a major role in bringing the interests of the US corporations in the global arena. During the Uruguay Round the USTR was in close connection with the major corporations through the International Intellectual Property Alliance (IIPA) and the Intellectual Property Committee (IPC). IIPA was created to promote the copyright industry interest, while the IPC consisted of twelve chief executive officers representing the IPRs-intensive industries. These influential business associations (Ryan, 1998) provided to the USTR several reports where they pointed out the damages caused to the US business by the IP piracy country-by-country. IPC major achievement was involving European and Japanese industry in their policy so that the US, Europe and Japan were united about the inclusion of an IP code in the General Agreement on Trade and Tariffs. When eventually WTO replaced GATT in 1994, it included the TRIPS Agreement as one of the core pillars. As Susan Sell explicitly claims, ‘twelve corporations made public law for the world’ (Sell, 2003, p. 96). In return, developing countries obtained the liberalization of international trade in textile and apparel through the Multifiber Agreement (see also Maskus, 2000).

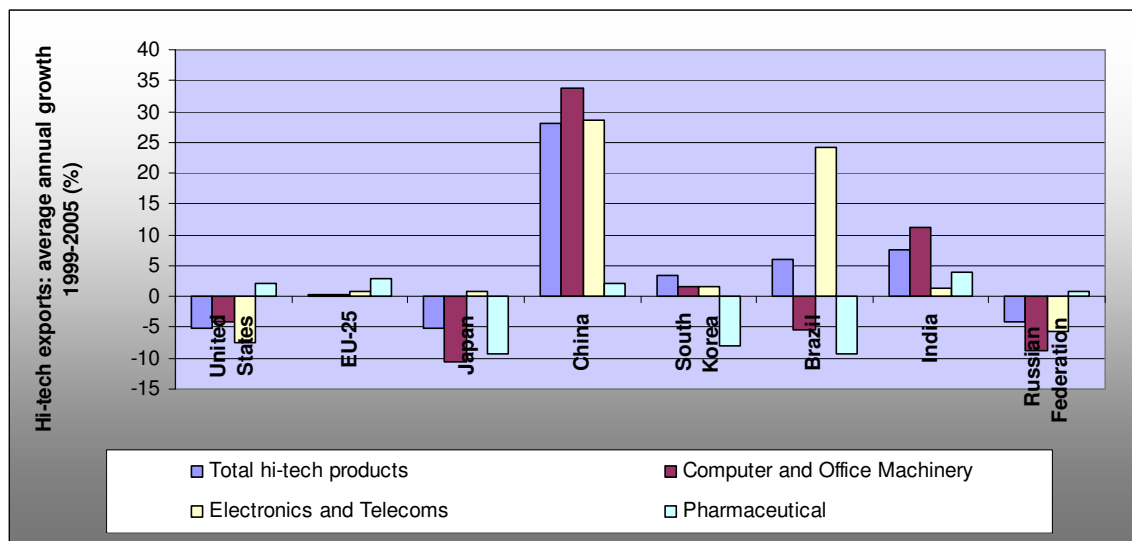
### ***Third Thesis: TRIPS may serve the interests of Western corporations but not necessarily of the Western economies***

The fact that TRIPS have been a Western imposition does not necessarily imply that they will manage to serve Western interests. Since the introduction of the TRIPS Agreement the trend of trade performance of the USA and other advanced countries has not changed remarkably. Emerging countries, those which TRIPS aimed to discipline for their alleged unfair IP infringement, have continued to erode the trade balance of the US, Europe and Japan. TRIPS have so far certainly

served the interests of some specific corporations, but it does not seem to be able alone to solve the problems for which it has been imposed, namely the challenge to the Western primacy in knowledge-intensive industries.

In Figure 1 we report the Average Annual Growth of exports relative to the hi tech products for some selected countries, over the period 1999-2005. The two emerging giants, China and India, continue to improve their performance in the international trade of hi tech industries against the Triad, i.e. US, Europe and Japan.

Figure 1 Average Annual Growth of exports relative to the hi-tech products for selected countries, 1999-2005



Source: authors' elaboration on data from the European Commission report 'Europe in the global research landscape' (European Commission, 2007)

This trend is confirmed also in terms of world share of hi tech exports reported in Table 2. In 2005 China has become the larger exporter of Computers and Office Machinery reaching a world share equal to 28.3 per cent followed by US (14.6) and EU-25 (8.3), and the second world exporter in electronics and telecoms. The supremacy of the Triad is still evident in an IPR sensitive industry as the pharmaceutical, where Western countries still accounts for over the 70 percent of world exports.

Table 2 Hi tech exports: world market shares 1999-2005 (%)

	Total hi-tech products		Computer and Office Machinery		Electronics and Telecoms		Pharmaceutical	
	1999	2005	1999	2005	1999	2005	1999	2005
United States	26.4	19.3	18.9	14.6	23.4	14.7	20.2	22.8
EU-25	17.1	17.2	8.2	8.3	11.5	12.1	38.6	45.6
Japan	12	8.7	11.9	6.0	13.3	9.6	4.0	2.3
China	3.4	15.0	4.9	28.3	2.9	12.9	3.1	3.6
South Korea	4.7	5.8	4.3	4.7	7.0	7.7	0.8	0.5
Brazil	0.4	0.6	0.1	0.1	0.1	0.4	0.4	0.2
India	0.2	0.3	0.0	0.1	0.0	0.1	1.5	1.9
Russian Federation	0.3	0.3	0.0	0.0	0.1	0.1	0.2	0.2

Source: as for Figure 1

Not surprisingly, the political concern about the declining US competitiveness has shifted from infringement of IPRs towards offshore outsourcing and offshoring.<sup>7</sup> The White Paper 'Offshore

Outsourcing and the America's Competitive Edge: Losing Out in the High Technology R&D and Services Sectors' released by Senator Joe Lieberman in May 2004 illustrates a rather different concern. The White Paper focuses on the 'challenge, which potentially could affect high and R&D research jobs, *not just manufacturing and call center jobs*' (Lieberman, 2004, our emphasis). The main point raised is that US corporations are moving abroad key components of their innovative activities, such as engineering, design, R&D and high-tech services. According to a survey carried out by UNCTAD (2005), Transnational Corporations (TNCs) perceive China and India as the most attractive locations, first and third respectively, where to invest in R&D activities. The Toyota Technical Center in Thailand, Motorola's R&D centres in China and Microsoft's sixth global research centre in Bangalore are just a few examples witnessing the fact that TNCs are investing at the cutting edge of the technology in the emerging countries (UNCTAD, 2005) (on the globalization of technology see also Archibugi and Iammarino, 2002; Archibugi and Pietrobelli, 2003).

The TRIPS Agreement has therefore not reversed countries' relative performance since 1994. The real winners from TRIPS are not the advanced countries, but rather the large corporations who pressed for their adoption. Empirical research has shown that multinational corporations are more likely to establish advanced and knowledge-based activities abroad if there is a strong and effective IPRs regime.<sup>8</sup> Multinational corporations willing to expand geographically their scope therefore need stronger IPRs regimes in the host countries (UNCTAD, 2005, p. 29).

The TRIPS Agreement, by strengthening the IP regime over the world has basically contributed to enlarge the playing field for large corporations. The latter have seen the opportunity to move their knowledge-based activities abroad by exploiting human resources, technological capabilities and a more reliable IPRs system. In the words of the Senator Lieberman 'while the American companies may be improving their individual competitiveness in the short term, they may be collectively undermining America's and their own competitiveness for the long haul' (Lieberman, 2004). It is somehow surprising and worth reflecting upon the fact that Western governments, first and foremost the US one, have insisted so much in introducing a new global regime of IPRs that might jeopardize the interests of their own citizens.

***Fourth Thesis: TRIPS alone will not lead to an increase of the technology gap between Western countries and emerging countries***

While many commentators argue that TRIPS alone may lead to an increase in the gap between the most technologically advanced and the least technologically advanced nations (see, for example, Chang, 2003; May, 2002a), we believe that the importance of IPRs should not be overestimated. IPRs clearly favour the generators of innovations and deter the imitators. But the lack of a clear-cut division between innovators and imitators, which stems from the complexity of the mechanisms of generation and diffusion of knowledge and innovation, will not allow IPRs and arrangements such as TRIPS to play a decisive role.

National IP systems are often the consequence of production needs (Moser, 2005). Developed countries have exempted particular industries from IP protection in accordance with their needs at a particular time. Since the Eighteenth century, IP policy was conducted as an important part of trade and industrial policy (Khan, 2002). For example, Germany did not provide patent protection to food products, pharmaceutical or chemical products, but only to their production processes. The American law at the beginning provided strong protection for their citizens but weak protection for foreign inventors. The Japanese system was deliberately designed to favour adoption and diffusion of technology (Ordovery, 1991). In a similar vein, India did not allow patent protection for drugs, chemical, optical glass and semiconductors, Thailand excluded chemical, drugs, food and

agricultural machinery, and Brazil did not offer protection for foodstuffs, chemicals and drugs (Chang, 2003; Khan, 2002).

If we look at how the IPRs systems have evolved within nations, there is the well founded suspicion that strong *IPRs seem to be the consequence rather than the cause of development* (Maskus, 2000; Mokyr, 2002). As the countries climb the development ladder and they become producers of innovations and technologies, the strengthening of IPRs is likely to come as a result of both industrial policy and pressure from the business. However, we contend that, while recognizing that IP have played an important role in sustaining industrial policies and development, today there are several factors at work which can impede to TRIPS to wide the technological gap between Western and emerging economies.

A great deal of empirical work has been carried out to address a simple question: do stronger IPRs encourage transfer of technology?<sup>9</sup> The main findings of this body of literature can be synthesized as follows: IPRs can be advantageous for countries with a certain degree of absorptive capacity and strong technological infrastructures, while they tend to increase the costs and reduce technology transfer for poorer countries. This evidence reinforces our assumption that the impact of IPRs on technology transfer has been overestimated since the magnitude of technology flows are affected by a variety of other factors including: the size of the market, the development of appropriate capabilities, the endowment of cheap and/or skilled human resources, and the presence of a reliable institutional environment. In a nutshell, *a strong IPR regime is not in itself a sufficient condition for the transfer of technology to occur.*

The IPRs do not have either a direct role in explaining different rates of growth across countries (Park and Ginarte, 1997), and as the Word Bank recognizes ‘at different times and in different regions of the world, countries have realised high rates of growth under varying degrees of IPR protection’ (World Bank, 2001). Within the manufacturing sector, the only industry in which IPRs seem to have a good efficacy in avoiding copying is pharmaceuticals. In most manufacturing industries, thus, the processes at the base of the adoption, adaptation and creative imitation of foreign technologies have large room for inventing around avoiding IP infringements even in a stronger IPRs regime.

In several occasions IPRs can also make it easier to invent around protected technologies inasmuch patents and copyright force the inventors to articulate and provide the disclosure of the information.<sup>10</sup> The institution of IPRs provides a legal framework for contractual agreements concerning technologies, which encourage the institution of ‘markets for technology’, making it easier the international transfer of technology and its diffusion at the local level (Arora et al., 2001; Lall, 2003). New emerging phenomena, such as the open source software, which offer innovative applications on non-proprietary IPRs base and that cannot be made legally excludable, offer a great deal of opportunity to emerging and developing countries to access crucial know how at very low costs and avoiding IP infringements. Thus, it is the nature itself of knowledge generation and diffusion mechanisms that make the real world very different from a hypothetical one where IPRs are able to block the use of specific know how. To conclude, we challenge the idea that TRIPS can be held responsible for the lack of catching up of developing countries since technology flows across countries are not driven by IPRs regimes alone.

## Box 2 – Four Theses to Assess TRIPS

### ***First Thesis: TRIPS aim at imposing the Western and broken IP regime to the rest of the world***

The IPRs regime has become stronger in the Western world. This trend has started in the United States, where the scope of IPRs have been extended to additional areas (e.g. software) and to additional subjects (e.g. public research centres and universities). But other Western countries have imitated the same trend. Through TRIPS, the US and other Western governments are trying to expand the Western logic to all countries. This has happened in a moment in which the ability of IPRs to provide incentives to the innovators and to facilitate the diffusion of knowledge has been increasingly questioned in the West itself.

### ***Second Thesis: TRIPS are the outcome of a non democratic process driven by a club of US corporations***

TRIPS have not been debated and negotiated as a global public good. On the contrary, they have been strongly pushed by the United States. In particular, they are the outcome of the pressures made by a handful of US corporations that have asked to, and obtained from, their government to act in their behalf.

### ***Third Thesis: TRIPS may serve the interests of Western corporations but not necessarily of the Western economies***

There is no evidence that TRIPS have been advantageous for the American citizens at large. On the contrary, it seems that TRIPS have been important to allow TNCs to expand their innovative activities globally relying on stronger IP regimes abroad

### ***Fourth Thesis: TRIPS alone will not lead to an increase of the technology gap between Western countries and emerging countries***

Both supporters and detractors of TRIPS have put too much emphasis on the economic significance of legal devices regulating intellectual property. By themselves, legal devices can neither impede developing countries to catch up nor allow developed countries to preserve their dominion in technological innovation. It would be much more important to concentrate on the economic, rather than the legal conditions, that allow or impede countries to maintain or acquire their knowledge base.

## **5. POLICY IMPLICATIONS: MUCH ADO ABOUT NOTHING?**

Over the last thirty years, the United States has started a race to increase the proprietary nature of knowledge, and it has managed to get at various stages the support of other Western countries. This privatization of knowledge had also an international dimension with TRIPS, an agreement pushed by a small number of Western multinational corporations and aimed to impose to the entire world a regime of IPRs dominant in the West and with evident signs of crisis. The strengthening of IPRs and TRIPS, however, have not and could not change the nature of knowledge and the ways in which this can be transferred among economic agents. As we have reiterated in this article, to achieve a successful transfer of know how between economic agents, both of them should be willing to devote time, resources and efforts to teach and to learn. For these reasons, we have argued that the importance of IPRs has been grossly overestimated: per se they can neither allow knowledge transfer nor obstruct it. On the one hand, IPRs cannot impede prospective imitators to acquire knowledge but just making it a bit longer and a bit more costly. Firms, in fact, profit much

more from their *economic* monopoly position built around their innovation rather than from the *legal* monopoly associated to their IPRs. On the other hand, even in absence of IPRs potential imitators will not be able to master knowledge unless they invest their time and resources. In spite of the often heated tone of the debate, the IPRs controversy seems to be a '*much ado about nothing*' controversy.

True, some key industries rely strongly on IPRs both at home and internationally. It is well known that pharmaceutical products are effectively protected by patents. Developing countries that cannot pay the full price for these drugs will not find themselves in the position to offer to their citizens the deserved medications. The judicial case of a few US pharmaceutical companies (the so-called Big Pharma) against the South African government for the use of drugs to combat HIV infection has been the most spectacular case precisely because there were at stake concentrated economic interests on the one hand and a life-saving drug on the other hand. But can we generalize from this case? There are not many life-saving drugs around (unfortunately!) and several of them are not any more protected by IPRs. And we should not forget Pharmaceuticals is just one of the several industries in the economy.

It is also true that other key sectors of the information society are strongly dependent on other IPRs (Guy, 2007). In spite of the massive investment afforded by companies in the industry to make it difficult to copy software, software revenues strongly benefit from the legal protection guaranteed by copyright. It is also true that audiovisual products strongly rely on IPRs. These are the typical products which are costly to produce but that can be copied at virtually zero costs. Software and audiovisual entertainments are increasing important industries but, again, they do not represent the total economy. It is difficult to justify that the economic development of emerging countries is hampered by the copyright on CDs and DVDs. And it is even more difficult to argue that pop singers, film stars and software companies are ruined by IP infringements. Moreover, stronger protection of IPRs may generate unexpected new entrants, as it happened with Linux in the case of software and Bollywood in the case of audiovisuals. There is the tendency to attribute to IPRs the existence of barriers to entry, and this is in principle true since IPRs generate a legal monopoly. But economic reality shows that barriers to entry are more often associated to anti-competition practices than at IPRs alone. Weakening IPRs may help to generate a more competitive market, but this should also be combined to more active anti-trust policies.

Those Western-based Corporations that have so much pressed for stronger IPRs have not realized that IPRs codify the positions of the past, not those of the future. To stick to the defence of IPRs is the typical position of losers, i.e. those which could maintain their market share only by relying on monopoly positions achieved through the innovations of the past. Winners, on the contrary, would be much less worried about defending the innovations of the past through IPRs since they are confident that they can maintain and enlarge their market positions through continuous innovation. The literature on appropriability has clearly shown that IPRs are just one, and not even the most effective, method to secure returns to companies' innovations.

But our analysis has also some important implications for public policies. We have argued that governments that have made IPRs stronger at home and in the world have not made a good service to their citizens. In fact, they have somehow diverted attention from the problem of offshoring of knowledge intensive jobs providing an advantage to their major corporations without realizing that also their workers may pay a price for it. A better service to citizens would have been provided by greater international cooperation in science and technology, involving both public and business players in large-scale research projects. These projects could provide new technological opportunities that companies could then exploit competitively.

We have already made it clear that developing countries should not have accepted TRIPS. Somehow these countries were confident that it would have been too difficult to enforce TRIPS and that, after all, the WTO devices were too slow and too complex to lead to sanctions of last resort. This is somehow what has happened: the number of controversies continues to be rather small. But opposing to TRIPS will certainly not by itself allow developing countries to fill their technology gap. Developing countries need much more demanding active policies to acquire knowledge. Some of them have managed to move from “developing” to “emerging” and even “developed” countries. The active learning policies of these countries, such as the East Asian tigers, realized that there are strong complementarities between domestic education, acquisition of knowledge from abroad, hosting foreign investment, and endogenous innovation. The policies of these countries should be a source of inspiration for those countries that are still lagging behind.

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<sup>1</sup> According to the legend, Doctor Faustus, an earnest alchemist, trades his soul to Mephistopheles to obtain 24 years of unrestrained creativity.

<sup>2</sup> For a review, see Maskus and Reichman, 2005; Mowery and Oxley, 1997; UNCTAD, 2005.

<sup>3</sup> Developmental state is a term used by international political economy scholars to refer to the phenomenon of state-led macroeconomic planning in East Asia in the late twentieth century. A development state is characterized by having strong state intervention, as well as extensive regulation and planning.

<sup>4</sup> Cohen et al., 2000; Levin et al., 1987; Mansfield, 1986; Merges and Nelson, 1990; von Hippel, 1998; Winter, 1987.

<sup>5</sup> The Most Favoured Nation clause establish that whatever more favourable treatment is agreed upon two or more countries is automatically extended to all the other nations. In this case to all the TRIPS signatories. Article 4 states that 'With regards to the protection of intellectual property, any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country, shall be accorded immediately and unconditionally to the nationals of all other Members'.

<sup>6</sup> For a more comprehensive explanation of the role of Section 301 and bilateral policies see Drahos, 1995; Ryan, 1998; Sell, 2003.

<sup>7</sup> Offshore outsourcing is the contracting of some business functions to companies usually in lower-costs countries. Offshoring is instead used to describe multinational corporations relocating work from their domestic sites to foreign locations.

<sup>8</sup> Mansfield, 1994; 1995; Maskus, 2000; Maskus and Reichman, 2005; UNCTAD, 2005.

<sup>9</sup> Branstetter et al., 2004; Chen and Puttitanum, 2005; Lall, 2003; Mansfield, 1994; 1995; Maskus, 2000.

<sup>10</sup> Despite the legal requirement of disclosure, business patent lawyers try to avoid the disclosure of strategic information at the base of the functioning of a technology (Bessen and Meurer, 2008).