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#### ENFORCING INTELLECTUAL PROPERTY RIGHTS: AN ECONOMIC PERSPECTIVE

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The opinions expressed in this paper are personal and should not be attributed to any institution with which the author is affiliated.

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Since the publication of this paper, Mr. Fink has joined the International Bureau of WIPO as Chief Economist.

## INTRODUCTION

1. Upholding the protection of intellectual property rights (IPRs) has emerged as a prominent policy issue. The year 2007 alone saw a G-8 summit calling for stepped-up enforcement of IPRs, the initiation of a WTO dispute on China's IPRs enforcement regime, and the launch of inter-governmental negotiations towards an Anti-Counterfeiting Trade Agreement (ACTA).<sup>1</sup> In addition, intellectual property chapters of free trade agreements (FTAs) negotiated over the past few years have introduced obligations on IPRs enforcement that go beyond multilateral standards inscribed in the WTO's Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). Several developed countries, in turn, have called for renewed discussions on enforcement in the TRIPS Council.
2. Concerns about trademark counterfeiting, copyright piracy, and other forms of IPRs violations are not new. Already back in 1985, *Business Week* characterized counterfeiting as "perhaps the world's fastest growing and most profitable business."<sup>2</sup> Indeed, the desire to stem in trade in counterfeit goods was at the origin of the GATT negotiations which eventually led to the conclusion of the TRIPS Agreement. However, two developments have sharpened the policy discourse on IPRs violations in recent years.
3. First, rapid global economic integration and the fast growth of middle income countries—led by China and India—have raised the stakes for intellectual property-owning companies. They see counterfeiting and piracy as a constraint on their ability to expand sales in rapidly growing markets. More fundamentally, they also view IPRs infringements as a direct competitive threat, as firms in labor-abundant countries copy the latest technologies and undermine what is perceived to be their remaining competitive edge. In the United States, politicians have linked lax IPRs enforcement abroad to the country's persistent trade deficit, especially with China. While such a link has little economic basis—the trade balance primarily reflects the difference between domestic savings and investment—it carries political weight and is shaping US trade and foreign policy.
4. Second, counterfeiting and piracy are perceived to have reached unprecedented levels. In part, the growth of counterfeiting has been spurred by technological developments which have facilitated the copying of original products. For example, the emergence of easy-to-copy digital storage mediums has enabled the cheap reproduction of audiovisual and software products without any loss of quality. The spread of online patent databases has permitted easy access to new technologies.<sup>3</sup>

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<sup>1</sup> See the G-8 summit declaration "Growth and Responsibility in the World Economy," (June 7, 2007, available at [www.g-8.de](http://www.g-8.de)), WTO Dispute DS362 "China — Measures Affecting the Protection and Enforcement of Intellectual Property Rights" ([http://www.wto.org/english/tratop\\_e/dispu\\_e/cases\\_e/ds362\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds362_e.htm)), and the press release "European Commission Seeks Mandate to Negotiate Major New International Anti-Counterfeiting Pact" by the European Commission (available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1573>).

<sup>2</sup> See "The Counterfeit Trade: Illegal Copies Threaten Most Industries," *Business Week*, December 1985, pp. 64-72.

<sup>3</sup> Admittedly, taking advantage of freely available information on technologies embedded in patents requires absorptive capacity, which differs markedly from country to country. At the same time, anecdotal evidence suggests that firms in developed countries increasingly refrain from filing patents, fearing misappropriation of their technologies in foreign countries. See "Firmen verzichten auf Patente," *Financial Times Deutschland*, January 2, 2008.

5. Due to their illegal nature, there are no reliable figures on the sales of intellectual property infringing products. The OECD (2007) estimates that international trade in counterfeit and pirated goods in 2005 may have amounted to as much as 200 billion dollars, or slightly more than 2 percent of global merchandise trade. This figure understates global commerce in IPRs-infringing goods, as it excludes domestic sales and digital products distributed via the Internet. Even though there are no hard numbers on the growth of IPRs violations, anecdotal evidence suggests that their scale and scope is expanding. For example, newspaper articles and government surveys in recent years indicate that counterfeiting activity has expanded from luxury to common consumer goods, affecting products as diverse as automotive replacement parts, electrical appliances, and toys. In addition, intellectual property violations are increasingly linked to organized crime.<sup>4</sup>

6. At one level, one might ask: why worry about IPRs enforcement as a matter of public policy? Governments set standards of intellectual property protection through national laws and ensuring that firms and individuals obey these laws seems only natural. To be sure, some observers have argued that the exclusive rights granted by intellectual property laws have become overly strong (Jaffee and Lerner, 2004 and Maskus and Reichman, 2004). However, no one would seriously argue for correcting this suspected overshooting of IPRs laws by promoting illegal behavior. If laws do not serve the public interest, they ought to be changed rather than disregarded.

7. Yet there is one important reason for regarding IPRs piracy as an issue of public policy: resources needed for enforcing IPRs are invariably scarce. Counterfeiting and product piracy exist even in the richest countries which have the best staffed and best equipped law enforcement agencies. For example, the Business Software Alliance estimates that, in 2006, 45 percent of software was pirated in France, 28 percent in Germany, 25 percent in Japan, and 21 percent in the United States.<sup>5</sup> Governments need to make choices about how many resources to spend on combating piracy, as opposed to enforcing other areas of law, building roads and bridges, protecting national security, and providing other public goods. Such choices are usually not stated in explicit terms, but they underlie every budgetary decision by federal and local governments. For example, greater spending on counter-terrorism in the United States after September 11, 2001 has left fewer resources for fighting crime, reportedly causing rates of crime to go up in many US cities.<sup>6</sup> Deciding on appropriate spending for IPRs enforcement is especially difficult in developing countries, where many public goods are underprovided and enforcement challenges exist in many areas of law—fighting violence, guaranteeing real property rights, upholding contracts, stopping illegal logging of endangered forests, regulating traffic, and so on.<sup>7</sup>

8. This paper seeks to offer an economic perspective on policies towards IPRs enforcement. It draws on key insights from the economic literature to identify priorities for the allocation of scarce law enforcement resources. Two major themes emerge from this literature. First,

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<sup>4</sup> See OECD (1997).

<sup>5</sup> See <http://w3.bsa.org/globalstudy/upload/2007-Losses-EMEA.pdf> and <http://w3.bsa.org/globalstudy/upload/2007-Losses-Global.pdf>.

<sup>6</sup> See “US Switches Resources to Fight Terror,” *Financial Times*, October 10, 2007.

<sup>7</sup> A second, non-economic reason for regarding IPRs enforcement as a public policy issue is that certain enforcement actions may invade the privacy of individuals and societies may need to establish how to best balance rights to intellectual property and rights to privacy.

different types of intellectual property infringements have different welfare effects, depending on underlying market failures and market characteristics. Past studies that have attempted to quantify the “losses” due to IPRs piracy have sometimes ignored these differences. Second, in designing an IPRs enforcement strategy, policymakers need to take into account the incentives of producers and consumers to break the law. Understanding these incentives offers important insights about the limits of government policy and the effectiveness of different types of enforcement activities.

9. The paper is structured as follows. The next section will briefly review the main economic rationales for protecting different types of IPRs, by pointing to the different market failures giving rise to government intervention. This discussion will set the scene for an evaluation of the welfare effects of different forms of IPRs infringements—an exercise performed in Section 3. We will then review available empirical evidence on the economic impact of counterfeiting (Section 4) and set out a broad framework for developing a national strategy towards IPRs enforcement (Section 5). The final section will conclude by briefly discussing what this paper’s economic perspective suggests for policymakers in developing and developed countries.

## 2. IPRS AND MARKET FAILURES

10. Intellectual property rights describe a set of legal instruments that, loosely speaking, guard firms’ intangible assets. From an economic perspective, it is useful to place these instruments into two categories: IPRs that protect firms’ reputation (trademarks and geographical indications) and IPRs that stimulate inventive and creative activities (patents, utility models, industrial designs, copyright, plant breeders’ rights and layout designs for integrated circuits). IPRs in both categories seek to address the failure of private markets to provide for an efficient allocation of resources, but underlying market failures differ.

11. In the case of trademarks and geographical indications (GIs), exclusive rights reduce inefficiencies that result from a mismatch of information between buyers and sellers on certain attributes of goods and services. Nobel prize-winning economist George Akerlof first pointed out that markets may fail when consumers have less information about the quality of goods than producers.<sup>8</sup> Trademarks identify a product with its producer and his reputation for quality, generated through repeat purchases and word of mouth. They create an incentive for firms to invest in maintaining and improving the quality of their products. Similarly, GIs identify a product as originating from a particular region, signaling that it possesses a certain quality associated with that region.

12. For certain classes of goods, trademarks and GIs fulfill an additional function. Consumers sometimes attach status value to products bearing a well-known brand-name. For example, buyers of designer handbags or high-end watches not only care about the functional and physical characteristics of their purchases, but also about the name of the product or producer itself. In such cases, trademarks not only protect a company’s reputation for objectively measured quality, but also its “prestige” built-up through marketing campaigns often stretching over years and decades. As we shall see in the next section, the presence of status value has an important bearing on the welfare implications of product counterfeiting.

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<sup>8</sup> See Akerlof (1970).

13. Intellectual property rights belonging to the second category resolve inefficiencies in markets for information and knowledge. Another Nobel prize-winning economist, Kenneth Arrow, long ago pointed out that information and knowledge can be easily reproduced once introduced in the market.<sup>9</sup> In economic jargon, they possess characteristics of public goods. As their name suggests, public goods are usually not provided by private markets. If firms cannot prevent third parties from copying the fruits of their inventive and creative activities, they have little incentive to invest financial resources into such activities. Arguably, inventive and creative would not grind to a halt without government intervention. Artists may be motivated by prestige or inherent self-interest in pursuing their profession. Firms may have other means of profiting from new technologies, such as benefiting from a first-mover advantage. Nonetheless, governments have historically opted to supplement these “natural” incentives with exclusive rights to intellectual property.

14. In their essence, IPRs in this second category seek to prevent free-riding behavior. They allow private agents to generate a profit from their intellectual assets with which they can recover the initial investment cost of creating these assets. However, exclusive rights also come with a cost. They confer market power to their owners, allowing them to price their intellectual goods above their costs of reproduction, to the detriment of consumers. Governments thus face a trade-off in formulating intellectual property policies: stronger exclusive rights increase incentives for information and knowledge-producing investments, but they also increase the economic efficiency loss due to market structure deviating from its competitive ideal.

15. In actual policy-making, this trade-off is reflected in the fact that exclusive rights are time-bound (in contrast to trademarks and GIs, which can last forever). In addition, different forms of exclusive rights have emerged to account for the varying characteristics of different economic sectors: chiefly, patents (for industrial technology), copyright (for literary and artistic expressions as well as computer software), and industrial designs (for ornamental features of goods). Technological change has led to a continuous adaptation of these instruments. Equally, different segments of society continuously challenge the appropriateness of different standards of exclusive rights and exceptions to them, with some groups even advocating alternative government policies to promote innovation—a debate that is beyond the scope of this paper.

### 3. EVALUATING THE WELFARE EFFECTS OF DIFFERENT FORMS OF IPRS INFRINGEMENTS

16. What happens if the exclusive rights conferred by IPRs are violated? This question has received some attention by economists, mostly in the law and economics and trade literatures. Most academic studies are of a theoretical nature, that is, they develop models of supply and demand to ascertain how unauthorized uses of intellectual property impact on different agents in the economy. In particular, studies in this area have adopted so-called partial equilibrium models, whereby economic welfare is measured by the sum of consumer and producer surplus (see Box 1). By nature, these models cannot capture the sophisticated complexities of how markets for IPRs-protected goods function in the real world. At the same time, their strength is to distill key aspects of consumer and producer behavior and evaluate their welfare consequences. Indeed, any statement about the economic effects of IPRs infringement will

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<sup>9</sup> See Arrow (1962).

invariably carry some assumptions about how markets function. The advantage of economic models is making those assumptions explicit and assessing their effects in a rigorous way.

17. In what follows, we review key insights from the economic literature for the different types of intellectual property, starting first with trademark violations and then moving on to infringements of copyright, patents, and related IPRs. After summarizing the different welfare effects predicted by the literature, we will consider several additional effects that typically fall outside the scope of academic studies. Throughout this section, we will, for now, leave aside the direct costs of enforcing IPRs, which will be the focus of the discussion in Section 5.

#### Box 1: Partial equilibrium models and economic welfare

The economic studies described in this section typically model the effects of counterfeiting and piracy in a partial equilibrium, meaning they only focus on the market for one good (or one class of goods) and do not take into account linkages of that market with the overall economy. For example, economy-wide wages and the prices of goods sold in other markets are assumed to be constant.

Economic welfare in partial equilibrium models is typically measured by the sum of consumer and producer surplus. In a nutshell, consumer surplus is the difference between the maximum price a consumer is willing to pay for a good and the actual market price. Intuitively, the lower the market price, the bigger the saving to consumers from not paying what they would be prepared to pay. Producer surplus, in turn, measures the difference between the market price and the minimum price at which producers would be willing to sell the good. Intuitively, the higher the market price, the bigger the benefit to producers from selling a good for more than what it would take to cover costs.

Partial equilibrium models introduce certain assumptions about consumer preferences, the cost structure of producers and their competitive behavior. The degree of intellectual property enforcement impacts on one or more of these variables and, ultimately, market prices, from which changes in consumer and producer surplus can be derived.

#### Trademark counterfeiting

18. A crucial consideration for evaluating the welfare implications of trademark counterfeiting is whether consumers are misled by the falsified brand name attached to their purchases. For example, most buyers of a 10-dollar watch bearing the Rolex label know perfectly well that they acquire a fake product. Simple inspection can often reveal if a product is fake or genuine and, even if not, most consumers know that genuine Rolex watches do not sell for 10 dollars. By contrast, simple inspection may not easily reveal whether a pharmaceutical product is counterfeit and the purchase price alone is unlikely to offer additional information on the product's origin.

19. We will first analyze product counterfeiting assuming that buyers really do not know that they purchase a counterfeit product. We will then turn to the case where buyers know that they are purchasing a fake. As will become clear, the welfare consequences from counterfeiting in these two cases differ markedly.

## Case 1: Consumers are misled

20. If consumers cannot by themselves distinguish fakes from originals, the presence of counterfeit goods undermines the signaling function of trademarks, as described in the previous section. Consumers will invariably be worse off. Purchasers of counterfeit products will, at best, derive a value from the product which is lower than the price they paid for it and, at worst, be exposed to physical harm if counterfeit products create health or safety risks. The consumption of misbranded products may also adversely affect other individuals—for example, when the intake of drugs with no or insufficient levels of active ingredients increases the risk of disease transmission or when defect vehicle replacement parts provoke traffic accidents.<sup>10</sup> In the parlance of economists, the consumption of counterfeit goods may impose “negative externalities”.

21. In the long-run, if consumers know that trademarks are imperfectly enforced, markets for certain high-quality goods may not exist to begin with. Consumers would not be willing to pay the full price of a high quality original, since they fear that their purchase may be a fake. At lower prices, in turn, producers of original products would not be willing to sell. In other words, the market failure of asymmetric information strikes exactly as George Akerlof predicted more than 30 years ago.

22. The only beneficiaries of counterfeiting are the producers of counterfeits. However, the benefits accruing to those producers are bound to be lower than the losses to consumers and original producers, such that economy-wide welfare is generally lower in the presence of counterfeiting.<sup>11</sup>

23. This result holds for closed economies and for the world economy at large. What if counterfeit producers are located in certain countries and export the overwhelming share of production, with domestic sales constituting a negligible share of output? For example, 90 percent of IPRs-infringing activities seized at the European border in 2006 originated in only 8 countries, with China alone accounting for 79 percent of all seizures.<sup>12</sup> Even though producers in these countries invariably profit from counterfeiting activities, it is not clear how far the economies hosting such producers gain as a whole. Welfare effects will depend on patterns of comparative advantage and, in particular, how production factors in those economies would be used if counterfeiting were not feasible. Nonetheless, stronger trademark enforcement may well lead to substantial short-run employment losses in the concerned countries—an issue to which we will return below.

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<sup>10</sup> Similarly, substandard counterfeit products can harm the environment. In the chemical industry, counterfeit fertilizers have reportedly caused the destruction of harvests in China, Italy, Russia, and Ukraine (OECD, 2008).

<sup>11</sup> Grossman and Shapiro (1988a) confirm the welfare-reducing effect of counterfeiting when there is free entry into markets for original products. Surprisingly, they also find that welfare effects are more ambiguous if the number of original producers in a particular market is fixed. This counter-intuitive result is due to information asymmetries leading market outcomes to be second-best even in the absence of counterfeiting. The existence of counterfeiting, in turn, may alter the rivalry among original producers in a way that they supply products at higher quality, leading to consumer welfare gains. However, the policy implications of this special result are not clear, as governments would find it difficult to fine-tune trademark enforcement such as to maximize overall welfare.

<sup>12</sup> See European Commission (2006).

## Case 2: Consumers are not misled

24. If consumers are perfectly aware that their purchases are fakes, a natural question to ask is: why do they prefer a product bearing a falsified label to a “generic” product of identical quality? The only plausible explanation is that they derive prestige or status value from the display of a particular brand name. Prestige value may be partly imaginary, for example when a consumer derives pleasure from carrying the same handbag as a Hollywood actress. More often, consumers derive status value by belonging to an exclusive club of consumers who share the same preferences and are able to afford high-end products. Individual consumers’ taste for status thus needs to be included in social welfare calculations. Such an exercise may at first seem tenuous. However, a taste for status is quite real. Why else would a consumer be ready to pay several thousand dollars for a brand-name watch, when a reliable generic timekeeper can be purchased for far less that amount? Indeed, the very presence of counterfeit status goods indicates that status matters.

25. What can we say about the welfare consequences of counterfeiting in these circumstances? To begin with, consumers who knowingly purchase fake products are likely to be better off from counterfeiting activity. They always have the option of buying either the original or a generic product of comparable quality. If they choose the fake product and are not misled, their choice reflects a rational trade-off between price, status value, and quality.<sup>13</sup>

26. For consumers of original products, a crucial question is whether and how their welfare is affected by the presence of fake goods. Suppose first that such consumers can perfectly observe whether other buyers acquire fake or original products. If so, their welfare is unaffected, as the composition of the exclusive club of original purchasers remains the same. Their welfare may even increase, as the presence of fakes may raise the status value derived from owning the “real thing”.

27. However, in most cases, it is more likely that consumers of originals cannot tell whether other consumers own counterfeit or original products. For many fashion products and accessories, the difference between a fake and an original can only be ascertained by close inspection or by the fanciness of the store in which the product is bought. To the casual observer, fakes and originals are often indistinguishable. Indeed, consumers of fakes would unlikely derive much status value from counterfeit products if they could not successfully pretend that they own the genuine product.

28. Grossman and Shapiro (1988b) develop a simple model in which the prestige value a consumer derives from a given brand is negatively related to the number of consumers who own products displaying the same brand name—regardless of whether those products are fake or genuine. The presence of fake goods thus undermines the prestige of owning the genuine product, leaving buyers of those genuine products worse-off from counterfeiting. However, Grossman and Shapiro show that the economy-wide welfare consequences from stronger

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<sup>13</sup> The OECD (2007) reckons that even if consumers knowingly purchase fake products, they may still suffer a utility loss, because of unexpected lower quality of such products. However, this prediction appears overly pessimistic. For many counterfeit goods, such as fashion apparel, or handbags, there is little uncertainty about quality at the time of purchase. Even where such uncertainty exists, it is not clear why rational consumers would systematically overestimate the quality of fake goods.



trademark enforcement are ambiguous: depending on demand structures, the loss suffered by consumers of counterfeits may exceed the gain to consumers of originals.<sup>14</sup>

29. Trademark owners will experience an increase in profits from stronger trademark enforcement, as some consumers switch from fakes to originals. In the long term, greater profitability in the market for genuine products will induce entry of additional firms. The arrival of additional brands brings about a dual benefit to consumers of originals: each brand is purchased by fewer consumers, thus raising the prestige value associated with each brand, and greater competition between brands leads to a fall in the price of those products.<sup>15</sup> Notwithstanding these additional benefits from market entry, the welfare consequences of stronger trademark enforcement remain ambiguous, as the loss to consumers of counterfeits may still outweigh any gain to consumers of originals.

30. Two additional considerations further complicate an already complex assessment of the welfare effects from counterfeiting. First, the presence of status goods may lead those consumers who cannot afford originals to be envious of those who can. Since the presence of counterfeit products may reduce this form of jealousy, there may be additional welfare losses from stronger trademark enforcement.<sup>16</sup> Second, since consumers able to afford original products are likely to have higher incomes than those unable to do so, stronger trademark enforcement may have distributional implications. A government seeking a more equal distribution of real incomes may assign a stronger weight to low income consumers in its social welfare calculations. On balance, the inclusion of distributional concerns along these lines makes it more likely that stepped-up trademark enforcement will lower economy-wide welfare—though, in the end, it remains an empirical question.

### Infringements of copyright, patents, and related IPRs

31. In general, violations of copyright, patents, and related IPRs affect the policy trade-off outlined previously: they weaken incentives for investments in inventive and creative activities but benefit users of these rights by offering them access to IPRs-protected goods at competitive prices.<sup>17</sup> If governments maintain socially optimal standards of protection, IPRs violations, by definition, will lead to a welfare loss. However, this is a big “if”. Actual patent and copyright regimes are often the outcome of history, rules of thumb, and the influence of vested interests.

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<sup>14</sup> In addition, stronger trademark enforcement will lead some consumers of counterfeits to switch to originals. If market entry is restricted, this effect will impact positively on welfare, as it leads oligopolistic producers of originals to expand output. However, the overall welfare effect remains ambiguous.

<sup>15</sup> Technically, prices of branded products only fall if underlying demand curves are convex.

<sup>16</sup> The inclusion of jealousy effects in consumer utility may again be seen as tenuous. However, studies in the field of behavioral economics have confirmed these effects in a variety of settings. See Zizzo (2007) for a recent review of the literature.

<sup>17</sup> Johnson (1985) shows that additional welfare losses occur if the production of a copy uses more resources than the production of an original product. However, digitization has arguably reduced the costs of copying, such that original producers are unlikely to have a substantial production cost advantage. Besen and Kirby (1989), in turn, show that original producers might even benefit from copying if the marginal cost of producing copies is increasing in the number of copies. Yet again, with modern copying technology, this assumption is unlikely to hold. Finally, Bakos et al. (1999) show that the sharing of copyrighted material among small social communities (e.g., family or friends) can increase or decrease copyright holders' profits, depending on the structure of consumer preferences. However, their analysis does not apply to large-scale commercial piracy—the main focus of this paper.

Economic optimization hardly plays a role—not least because the social benefits of inventive and creative activities are unknown *ex-ante*. If the degree of protection as inscribed in laws is too strong, some levels of IPRs violations will increase welfare. If the degree of protection is too weak, any IPRs violation will invariably lower welfare.

32. An interesting question is how consumers of original products will fare upon stepped-up IPRs enforcement. Reduced competition from IPRs-infringing goods may increase the market power of the IPRs-holder, leading to higher prices for originals. However, the price effect will also depend on the price sensitivity of demand exhibited by the group of consumers that purchase originals. If their price sensitivity is lower than the average price sensitivity among all consumers in the economy, producers of originals may respond to stronger enforcement by lowering their prices. Such an outcome is consistent with consumers of originals being relatively well-off compared to consumers of illegitimate products. Indeed, original copyrighted works (e.g., audiovisual recordings) are sometimes more expensive in developing countries with higher piracy rates, as copyright holders set prices mostly reflecting demand from high-income consumers.<sup>18</sup> However, possible price effects upon stronger IPRs enforcement may well be small if the distribution of income is such that only few consumers will be able to switch from IPRs-infringing to legitimate goods.

33. As in the case of trademarks, stronger enforcement of copyright, patents, and related IPRs is likely to have distributional consequences, which governments may want to take into account in their social welfare calculations. How the distribution of real incomes will be affected will, in part, depend on the average incomes of consumers of illegitimate products relative to the average incomes of workers engaged in creative and inventive activities. In a developing country context, where most intellectual property is owned by foreign residents, governments seeking to promote a more equal distribution of real incomes may attach more weight to the welfare losses suffered by low income consumers of IPRs-infringing goods relative to the strengthened incentive for investments in creative and inventive activities. Yet again, the national and global welfare effects of stronger IPRs enforcement remain ultimately an empirical question.

34. Notwithstanding these general considerations, there is one important market characteristic that affects the welfare calculus associated with certain types of IPRs violations: the presence of demand linkages.

#### Demand linkages

35. In certain cases, consumers' valuations of products increase with the number of other consumers who own the same product. Economists call such positive interdependencies among consumer valuations "network externalities" (or demand-side economies of scale).<sup>19</sup> An example would be packaged computer software protected by copyright. The value of one person's purchase of a word processing application is enhanced if that person's colleagues and friends use the same application, such that electronic documents can be easily exchanged.

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<sup>18</sup> Price-setting in any given country may also be influenced by parallel import policies in foreign countries. Rights holders may not be willing to offer a lower price domestically for fear that products are parallel exported to rich country markets and undermine higher prices in those markets. See Fink (2005).

<sup>19</sup> In fact, goods possessing network externalities can be seen as the opposite to status goods, for which consumer valuations decline with the number of other consumers (see the discussion above).

Network externalities may also exist for certain patented technologies that evolve into an industry standard.

36. What happens if goods possessing network externalities—say a popular software product—are illegally copied? As in the more general case, consumers of pirated versions of the product will likely be better off, as they gain royalty-free access to the software. For example, Microsoft's Office Suite, selling for several hundred dollars in the United States, can be purchased illegally for just a few dollars in many developing countries. However, consumers of the genuine software product will also benefit from the presence of pirated copies, as such copies expand the size of the product's user network.

37. In addition, Takeyama (1994) formally shows that even the original producer of the software may benefit from unauthorized copying activity. The intuition behind this result is that the higher valuation of consumers of genuine copies may allow the producer to charge a higher price supporting larger profits. In theory, the software producers could reap the same higher profits by simply giving away legitimate copies of the software to those consumers who otherwise would purchase pirated copies. However, in practice, this strategy would not be possible, because those consumers willing to buy the full price for the original copy would nonetheless line up to obtain a free one. In other words, illegal copying activity in the presence of network externalities can allow the software producer to segment the market and to price-discriminate, reaping higher profits compared to a scenario where there is no illegal copying.<sup>20</sup>

38. This result raises the possibility that IPRs infringement may be Pareto improving—meaning that some economic agents are better off without any other agent being worse off. However, gains to IPRs-owning producers are, by no means, guaranteed. At extremely high rates of infringement activity, these producers are bound to lose. In the end, the direction of the welfare effect is again an empirical question and it will depend *inter alia* on the strength of the network externality at hand and the dispersion of consumer incomes.

39. Some observers have also pointed to network externalities in the case of copyrighted material, when the consumption of such material necessitates ownership of hardware. For example, higher piracy rates of musical recording might increase ownership of CD-players, which in turn may stimulate the demand for legitimate CDs.<sup>21</sup> However, the increasing role of the Internet in distributing copyrighted material may well have diminished the importance of such externalities.

40. Another effect may be at work in the case of certain audiovisual works. Buyer decisions for such works are often influenced by the purchasing decisions of their peers. This may be either because the decisions of the latter may provide the former information about new product offerings or the former simply want to conform to social trends.<sup>22</sup> While these

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<sup>20</sup> Software piracy could also prove beneficial to original producers in an inter-temporal setting. In the presence of network externalities and high costs of switching to a competing software product, consumers of a pirated product may be more likely to purchase newer versions of the original product, once copyright protection is more stringently enforced in the future.

<sup>21</sup> For empirical evidence of such demand complementarities for CD players and music CDs, see Gandal et al. (2000). Karaca-Mandic (2003) offers similar evidence for DVD players and digital video disks.

<sup>22</sup> See Burnkrant and Cousineau (1975) for a formal exposition of these effects.

types of demand linkages are different from the network effects outlined above, their implications are similar: the spread of pirated products may further stimulate demand, part of which may fall onto legitimate copies. In addition, depending on demand structures, it is theoretically possible that copyright holders profit from some levels of piracy.

### Summary

41. Table 1 summarizes the welfare effects from stronger trademark enforcement associated with different types of IPRs, as discussed in this section. The table also suggests examples of products falling into the different categories of IPRs violations. This classification is somewhat crude and one product may well fall into several categories. Similarly, the direction of welfare effects should be considered as indicative only. In some cases, they depend on certain assumptions about market demand and supply.

42. In addition, where economy-wide welfare effects are ambiguous, the inclusion of distributional objectives would affect the direction of the final outcome. These caveats notwithstanding, the table reveals quite clearly that different types of intellectual property infringement impact differently on consumers, producers, and the economy at large. Governments are well-advised to take these differences into account when developing an IPRs enforcement strategy and deciding about the allocation of scarce enforcement resources.

Table 1: Overview of welfare effects from stronger IPRs enforcement

Intellectual property right	Market characteristic	Examples of products	Welfare effects from stronger IPRs enforcement
Trademarks	Consumers are misled	Pharmaceuticals, chemicals, pesticides, vehicle replacement parts, food and drink products, tobacco, electrical components, toys	<u>Consumers</u> : positive (especially where negative externalities are present) <u>Producers</u> : positive <u>Economy</u> : positive
	Consumers are not misled	Fashion apparel, footwear, handbags, personal accessories (sunglasses, handbags, leather articles, watches), cosmetics	<u>Consumers of counterfeit goods</u> : negative <u>Consumers of genuine goods</u> : positive <u>Producers</u> : positive <u>Economy</u> : ambiguous
Copyright, patents and related IPRs	No demand linkages present	Designs (cars, tools, toys), industrial technology, literary works	<u>Consumers of infringing goods</u> : negative <u>Consumers of original goods</u> : ambiguous <u>Producers</u> : positive <u>Economy</u> : positive, assuming standards of protection are socially optimal; ambiguous otherwise

	Demand linkages present	Certain types of computer software, patented technology that evolves into an industrial standard, audiovisual recordings, DVDs, PC and video games	<u>Consumers of infringing goods</u> : negative <u>Consumers of original goods</u> : negative <u>Producers</u> : ambiguous <u>Economy</u> : ambiguous
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### Other effects

43. In addition to the core welfare implications outlined above, there are three additional channels through which IPRs violations may affect economic performance and other aspects of societal well-being. In particular, stronger IPRs enforcement may have a bearing on tax revenues, employment, and organized criminal activity.<sup>23</sup> In the remainder of this section, we will briefly discuss possible short and long-run effects in these three areas and point to difficulties in assessing such effects. As will become clear in the discussion, a common problem in this context is the establishment of appropriate counterfactual scenarios to compare different enforcement regimes.

### Tax revenue

44. There is little doubt that stronger IPRs enforcement will impact on government tax revenue. Given the illegal nature of the transaction, consumers do not pay sales, value added, or excise taxes on purchases of counterfeit or pirated goods. To the extent that stronger IPRs enforcement will lead some consumers to switch from illicit to legitimate products, governments will likely collect more revenue from these types of taxes.<sup>24</sup> Larger profits of IPRs-owning producers may, in turn, increase revenue from corporate income taxes. Finally, where governments maintain positive import tariffs and stepped-up border enforcement leads to an increase in imports of legitimate goods, revenue may receive an additional boost.

45. While larger tax revenues are likely to be welcomed by governments in the short-run, the critical question is: what will governments do with the additional funds? In principle, enhanced tax revenues should not affect society's preferences for public spending in the long run. Governments may thus either use additional revenues to lower tax rates or pay down the national debt. The new fiscal policy has the potential to increase economic efficiency, but such an outcome is not guaranteed. It depends on the specific tax measures employed and larger considerations relating to public debt management. Equally, the distributive consequences of reduced tax evasion are unclear *ex ante*. The final outcome will depend on the type of taxes affected by stronger IPRs enforcement and the real incomes of persons paying less or more taxes.

<sup>23</sup> An additional consideration may be the waste entailed in the destruction of seized counterfeit or pirated goods. However, as shown in Grossman and Shapiro (1988b), producers of IPRs-infringing goods will pass on the loss associated with seized shipments to consumers through higher prices for the goods that make it to the market—an effect already taken into account in the analysis outlined above. If governments cannot auction off seized goods as “generic” products, they face the additional cost of destroying those goods. This cost can be seen as part of the law enforcement cost, to which we will turn in Section 5.

<sup>24</sup> Theoretically, it is also possible that tax revenue falls if stronger IPRs enforcement will lead to a sufficiently large fall in prices for genuine products, as outlined in the discussion above.

## Employment

46. Economists like to think that in the long run economies will converge towards full employment (leaving aside frictional unemployment). Thus, those workers who lose their jobs as a result of stronger IPRs enforcement will invariably find a different employment. By definition, enforcement policies will, in the long run, not affect the national unemployment rate.

47. However, this view is incomplete for two reasons. First, there may well be substantial unemployment in the short-run. In many developing countries, the distribution of counterfeit and pirated goods often offers an important source of employment for low-skilled workers. Typically, there is no social safety net offering short-term relief for workers losing their jobs in the informal sector. Such workers and their dependents may thus experience hardship and, in the absence of legitimate alternatives, may well return to the IPRs-infringing business. As will be discussed in Section 5, sustained reductions in rates of piracy and counterfeiting will likely require the creation of legitimate employment opportunities for low-skilled workers who earn their living from selling counterfeit and pirated goods.

48. Second, stepped-up IPRs enforcement may affect the economy-wide composition of jobs. The OECD (2007) indicates that working conditions in the informal IPRs-infringing sector are poor, with low levels of pay and workers being exposed to health and safety risks. By contrast, jobs created by IPRs-holders tend to be better paid and offer workers greater benefits and job security. Such a comparison seems too simplistic, however. Working conditions in the informal sector may be appalling, but the mere fact that workers are willing to accept such conditions suggests that they have no better alternative. In addition, the number of jobs lost due to stepped-up IPRs enforcement is unlikely to match the number of jobs gained and, in any case, the identity of affected workers—and possibly the country they live in—will be different. That said, compositional effects due to stronger IPRs enforcement are difficult to evaluate, as they depend on economy-wide labor market dynamics.

## Organized crime

49. That IPRs violations may stimulate organized crime follows tautologically from the fact that commercial-scale counterfeiting and piracy are criminal activities and require non-trivial organizational efforts. However, the concern is usually broader. Evidence reported by the OECD (2007) suggests that groups and individuals setting-up and profiting from IPRs-infringing operations may also be involved in other criminal activities, such as heroin trafficking, prostitution, extortion, and alien smuggling. There may, indeed, be “economies of scope” from engaging in different criminal activities.<sup>25</sup> If so, counterfeiting and piracy activities may stimulate other forms of crime and, reversely, increased IPRs enforcement—in the form of pursuing the criminal syndicates behind large-scale IPRs-violations—may lead to a reduction of other crimes. In economics jargon, there may be a “positive externality” from enhanced IPRs enforcement. That said, it is not clear whether scarce law enforcement resources should be devoted to pursuing IPRs violations rather than other criminal activity, to the extent that such a distinction is meaningful.

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<sup>25</sup> For example, the OECD (2007) reports that Chinese crime syndicates force people they smuggle into Europe to pay off their transport costs by working as distributors of pirated goods.

50. The OECD (2007) also points to evidence of links between counterfeiting and piracy activity and the financing of extremist or paramilitary groups, notably in Northern Ireland, Kosovo, and through South American free-trade zones. Again, stepped-up IPRs enforcement may serve to reduce the harm that such groups inflict on societies, though one needs to take into account that they may respond by switching to other—including legitimate—financing sources.

51. As a final caveat, available evidence on the links between IPRs infringements, organized crime, and the financing of extremist groups is anecdotal in nature. While credible, it would be important to have more systematic evidence of potential positive externalities from stronger enforcement action. Otherwise, loose references to links to organized crime or even “terrorism” risk being abused by vested interests who stand to benefit from strengthened enforcement of their exclusive rights.

#### 4. EMPIRICAL EVIDENCE

52. The discussion of the preceding section suggested that the economic effects of IPRs violations depend critically on the types of IPRs involved and underlying market characteristics. In developing an IPRs enforcement strategy, policymakers would thus benefit from empirical guidance on how producer, consumer, and economy-wide welfare will fare under alternative enforcement policies. Several questions appear paramount. What share of output in a given sector and in the economy at large is associated with IPRs violations? What is the relative importance of the different categories shown in Table 1? How many consumers would switch to legitimate products if IPRs-infringing goods are removed from the market? How will lower rates of counterfeiting and piracy affect price-setting by IPRs-holders?

53. As pointed out in the introductory section, the production and sale of counterfeit and pirated goods largely escapes official statistical recording systems. Accordingly, there is little empirical evidence that would shed light on these questions. Nonetheless, some studies exist. The purpose of this section is to briefly review these studies and their methodologies.

54. As mentioned in the introductory section, the OECD (2007) estimated the value of international trade in IPRs-infringing goods at 200 billion dollars, or slightly more than 2 percent of global merchandise trade in 2005. Close inspection of the methodology applied to arrive at this figure reveals that it is more an “educated guess” than a true estimate. Essentially, OECD staff made use of seizure rates across different product categories and exporting nations to extrapolate what a given share of IPRs-infringing trade in one individual product category means for the overall share of trade in counterfeit and pirated goods. However, the share in the relevant “fix-point” product categories—wearing apparel, leather articles and tobacco products—underlying the 200 billion dollar estimate is not based on any hard data, but rather reflects the best guess of OECD staff.

55. This should not be seen as a criticism of the OECD’s analysis—though one should be concerned about the use of the 200 billion dollar figure as a statement of fact in the popular press.<sup>26</sup> In fact, the OECD study offers insightful evidence of the relative importance of IPRs violations across different product categories. Two findings are particularly noteworthy. First, trade in IPRs-infringing goods appears to be concentrated in a small number of

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<sup>26</sup> See, for example, “World 'losing' war against fakes and piracy”, *Financial Times*, December 4, 2007.

“sensitive” product categories: the top five product groups account for more than three-quarters of all customs seizures.<sup>27</sup> Even if shares of trade in counterfeit and pirated goods in these categories were substantially larger than assumed by the OECD study, the corresponding share in overall trade would likely remain small.<sup>28</sup> Second, the four most-affected product categories—accounting for 65 percent of all seizures—pertain to fashion apparel and related items on the one hand, and audiovisual recordings and software on the other.<sup>29</sup> This pattern suggests that for a substantial proportion of IPRs-infringing goods consumers know that they are purchasing counterfeit and pirated goods, and they likely derive some benefit from doing so. In fact, this notion is confirmed by consumer surveys that reveal that lower prices are a critical motivation for purchasing counterfeit or pirated products.<sup>30</sup>

56. Industry associations representing copyright-holders regularly publish estimates of lost revenues due to piracy.<sup>31</sup> However, such estimates often rely on questionable assumptions about market demand. For example, BSA (2007) simply assumes that, in the absence of piracy, all consumers of pirated software would switch to legitimate copies at their current prices. This outcome is unrealistic—especially in developing countries where low incomes would likely imply that many consumers would not demand any legitimate software at all. Accordingly, estimated revenue losses by software producers are bound to be overestimated.<sup>32</sup> Similar conclusions emerge from an experimental study of the music consumption behavior of university students. Maffioletti and Ramello (2004) find that students’ willingness to pay is generally lower than the market price for legal products. Thus, increased copyright enforcement would not expand sales of legitimate copies on a one-for-one basis. At the same time, the study revealed that students’ willingness to pay for a pirated copy was significantly greater than its marginal cost. This finding suggests the possibility that copyright holders respond to stronger copyright enforcement by lowering their prices to capture a larger number of consumers.

57. Many studies have been devoted to the effect of Internet file sharing on the sales of CDs. The overwhelming majority of studies confirm a negative effect, though with varying

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<sup>27</sup> Product groups are defined as 2-digit chapters of the Harmonized System. There are 96 such chapters. As the OECD report acknowledges, seizure rates may be a biased indicator of the relative distribution of IPRs-infringing goods, as interceptions by customs authorities may be more frequent in product categories known to be sensitive to trade in counterfeit or pirated goods.

<sup>28</sup> The share of the top-five product categories in world trade is 18.5 percent. However, in the largest 2-digit category (HS85), one sub-category (HS 8524) accounts for 85 percent of all seizures but only 2 percent of world trade. Taking this bias into account, the share of the most-affected product categories in world trade drops far below 10 percent.

<sup>29</sup> To be precise, the four categories are articles of apparel and clothing accessories (HS61, HS62); records, tapes, and other recorded sound media including software (HS8524); articles of leather, saddlery and harness, travel goods, handbags, articles of gut (HS42); and footwear, gaiters, and the like (HS64).

<sup>30</sup> For example, see the report *Fake Nation?*, available at <http://www.allianceagainstiptheft.co.uk/downloads/pdf/Fake-Nation.pdf>

<sup>31</sup> See, for example, BSA (2007) and IFPI (2006). For a critique, see “BSA or Just BS?”, *The Economist*, May 19<sup>th</sup>, 2005.

<sup>32</sup> IPFI (2007) offers a more nuanced approach for the music recording industry, by simply publishing an estimate of the value of pirated goods (presumably valued at pirated goods prices). However, the methodology for arriving at this value estimate is not explained.



size, depending on the estimation methodology and city/country samples analyzed.<sup>33</sup> At the worldwide level, Zentner (2006) estimates that file sharing accounted for a 15 percent decline in CD sales, with larger declines for developed countries with higher Internet penetration rates.

58. Finally, Hui and Png (2003) estimate the effects of piracy on the legitimate demand for recorded music in an econometric setting. One notable feature of their underlying model is that it accounts for the demand linkages outlined in the previous section—sales of pirated products stimulating demand for legitimate ones. Testing their model in a panel covering 28 countries and the 1994-1998 period, they find that the net effect of piracy on the demand for legitimate music is negative. However, their estimate of forgone sales by copyright holders is 58 percent lower than the music industry's estimate. The latter assumes that every sale of a pirated unit reduces legitimate sales by exactly one unit. The difference between Hui and Png's estimate and that of the music industry is not only due to the presence of demand linkages, but also the possibility that stronger IPRs enforcement will drive some price-sensitive consumers out of the market.<sup>34</sup>

59. The study by Hui and Png is one of few econometric studies that has employed a structural model of the demand and supply for IPRs-protected goods.<sup>35</sup> More such studies could usefully inform policymakers. Even if they fall short of gauging the long term economy-wide welfare effects, they are helpful in offering a realistic estimate of the short term impact of stepped-up IPRs enforcement on consumers and firms' profits.

## 5. TOWARDS AN IPRS ENFORCEMENT STRATEGY

60. IPRs are private rights and upholding such rights is, first and foremost, the responsibility of rights holders. Nonetheless, governments play an important role in enforcing private rights. For companies to pursue and receive compensations for IPRs infringement acts, they need the assistance of courts. In addition, certain forms of IPRs violations—such as commercial-scale copyright piracy—are considered criminal activities and the prosecution of such violations is the direct responsibility of governments. Even when IPRs infringements fall under civil law, many governments allow for so-called *ex officio* actions—competent law enforcement authorities pursuing infringements without a right holder's complaint. For example, *ex officio* actions are commonly applied to intercept shipments of IPRs-infringing goods when they pass through customs.

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<sup>33</sup> See Liebowitz (2006), Peitz and Waelbroeck (2004), Zentner (2005), Michel (2005), and Rob and Waldfogel (2006). Only one study—Oberholzer and Stumpf (2007)—finds no effect of file sharing on CD sales.

<sup>34</sup> One limiting feature of Hui and Png's model is that copyright holders are assumed to not adjust their prices in response to lower piracy. If the presence of pirated copies in the market leads copyright holders to lower prices, they will incur additional losses, which are not captured by Hui and Png's estimate of forgone sales.

<sup>35</sup> In the area of trademarks, the International Trademark Association (INTA, 1998) estimated that apparel and footwear producers lost an average of 22 percent of their sales in 1995 as a result of trademark counterfeiting. This estimate was obtained from an econometric model relying on sales data of selected firms and their perception of the quality of trademark protection in 40 countries. However, the study's econometric set-up seems questionable. In particular, the trademark variable is interacted with countries' population size. The rationale for doing so is not further explained. Given the much larger variation in population sizes, it may well be that the interaction term mainly picks up a population rather than a trademark effect. Unfortunately, the study does not report results using the trademark variable only.

61. In principle, governments thus exert considerable control over the level of IPRs enforcement in their jurisdictions. At the same time, enforcement actions take real resources. Courts, police forces, customs offices and other competent authorities need to be adequately staffed and equipped to respond to complaints by right holders and to act on their own. In addition, governments face the costs of maintaining prisons and, possibly, destroying seized pirated and counterfeit products that cannot be auctioned off as generic goods. In analyzing the welfare consequences of piracy and counterfeiting, Section 5 left aside the real resource costs associated with IPRs enforcement. In this section, we will explore government strategies towards IPRs enforcement, explicitly taking these costs into account.

62. Violations of IPRs do not arise out of intrinsic disregard for the law. Individuals break the law largely because it “pays” to do so. Starting with the seminal study by Becker (1968), economists have long analyzed the incentives for illegal behavior and their implications for the design of law enforcement policy.<sup>36</sup> Even though this branch of the literature has not specifically explored violations of IPRs, its general approach and several broadly applicable insights are helpful in framing government policy towards IPRs enforcement.

63. The point of departure in economic analysis is the existence of a market for offenses. The supply side of this market is made up by individuals, who consider entering an illegal activity—say, the production of counterfeit goods. Each individual’s decision to break the law depends on the expected pay off (the profit from selling counterfeit goods), the costs of escaping punishment, the wage rate in an alternative legitimate activity, the probability of apprehension and conviction, the prospective penalty if convicted, and the individual’s (dis-)taste for breaking the law (consisting of a combination of moral values and preference for risk).

64. The demand for offenses stems directly from consumers’ demands for products at different levels of quality. If consumers purchase fake products unknowingly, the demand for offenses will equal regular market demand. If they purchase such products knowingly, the demand for offenses will fall short of regular demand: only at a price sufficiently below the price of original products are consumers willing to take on the risk of getting caught and punished or, at the least, to set aside moral concerns about supporting an illegitimate business.

65. Before turning to enforcement actions by governments, the simple model of a market for offences already offers an important insight about the extent of IPRs violations. Levels of economic development will invariably affect the equilibrium level of offenses. Theoretically, this effect is ambiguous. On the supply side, richer countries are likely to offer higher wages in alternative legitimate activities, thus increasing the opportunity cost of breaking the law. At the same time, richer markets may also offer potential offenders a higher expected pay off from violating IPRs. On the demand side, average incomes of consumers in rich countries are higher, rendering them less budget-constrained when deciding about their purchases and therefore less likely to turn to counterfeit or pirated products. Empirically, the first supply-side and the demand-side effects appear to dominate: IPRs violations usually correlate negatively with per capita income. For example, the correlation coefficient between rates of software piracy and per capita GDP in 2004 takes on a value of -0.89.<sup>37</sup> Notwithstanding the

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<sup>36</sup> Ehrlich (1996) offers a review of the literature up to the mid-1990s.

<sup>37</sup> Software piracy rates were taken from BSA (2007) and data on GDP per capita (measured on a purchasing power parity basis) come from the World Bank’s World Development Indicators. In analyzing seizure rates from different countries, the OECD (2007) finds an inverted U-relationship between a country’s propensity to export counterfeit and pirated goods and its GDP per capita. This

importance of policy, such a strong correlation suggests that substantial reductions of piracy levels in less developed countries will to a large extent emanate from sustained economic growth.

66. Turning to policy, it is optimal for governments to devote a level of public spending on law enforcement, such that the marginal benefit of fighting IPRs violations equals the marginal cost of enforcement activity. The marginal benefit includes the welfare effects outlined in Section 3. The marginal cost includes the opportunity cost of not using scarce fiscal resources to provide other public goods. Public spending on law enforcement will affect the probability of apprehension and the penalties faced by suppliers, distributors and (knowing) consumers of IPRs-infringing goods, leading to adjustments in the market for offenses until equilibrium is reached.

67. Even though theoretical in nature, the economic approach to illegal behavior offers three important insights applicable to violations of IPRs law. First, optimal government spending on enforcement is consistent with positive “equilibrium” levels of counterfeiting and piracy. Given other demands on public expenditure and diminishing returns to enforcement actions, society “tolerates” to some extent violations of laws (Ehrlich, 1996). Of course, this prediction is perfectly consistent with observed practice: sales of counterfeit and pirated goods take place in every economy. In addition, “tolerable” levels of IPRs-infringements may well differ from country to country, depending, *inter alia*, on societies’ preferences for different public goods. As mentioned in the introductory section, developing countries are likely to have different public spending priorities. Even within the law enforcement domain, the optimal share of budgetary resources devoted to IPRs enforcement will be lower in countries with higher levels of violence or less secure real property rights. Indeed, the enforcement part of the TRIPS Agreement sensibly recognizes that governments face competing demands for scarce law enforcement resources. In particular, TRIPS Article 41.5 of reads:

It is understood that this Part does not create any obligation to put in place a judicial system for the enforcement of intellectual property rights distinct from that for the enforcement of law in general, nor does it affect the capacity of Members to enforce their law in general. Nothing in this Part creates any obligation with respect to the distribution of resources as between enforcement of intellectual property rights and the enforcement of law in general.

68. Second, should IPRs enforcement activities target the producers of fake and pirated goods, their distributors, or consumers who knowingly buy illegal goods? To answer this question, it is important to differentiate between the effects of enforcement actions at the level of individuals and the effects at the level of markets. In particular, an increase in the number of raids of pirated goods sellers will lead some distributors to exit the market, either because they are deterred by the raids or they are caught and temporarily incarcerated. However, if production and demand of illicit goods remain undeterred, other distributors will expand their

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finding is not necessarily inconsistent with the strong negative correlation for rates of software piracy, as the BSA data mainly covers middle and high income countries. That said, the export propensity measure constructed by the OECD captures the production (and distribution) of IPRs-infringing goods, whereas software piracy rates relate to the consumption of such goods.

sales and make up for those who exited the market. The overall piracy rate would remain unaffected. A case can therefore be made for focusing enforcement efforts on producers of IPRs-infringing goods, which are bound to be smaller in number. Such a focus may also create positive externalities, if producers are linked to organized crime syndicates—as discussed in Section 3.

69. Third, in addition to negative incentives posed by penalties, governments can affect the equilibrium level of offenses through positive incentives, notably by adopting measures that create legitimate employment opportunities. Such measures will likely lead to a more durable reduction in IPRs infringement rates, as it fundamentally alters the net pay-off from illegitimate activities. Short term incarceration of offenders, by contrast, may have little impact on individual incentives. Offenders discount the risk of apprehension when they decide to break the law and they are therefore bound to return to their illegal activity upon termination of the prison sentence. Although long-term job creation will mainly result from sustained economic growth, targeted employment measures could well make a difference in the short term.

70. Another way of containing the supply and demand for offenses is for governments (and IPRs-holders) to sensitize the public to the illegal nature of counterfeiting and piracy, and their potentially adverse social implications. As noted above, moral values enter the pay-off function of individuals considering the production of illicit goods and consumers contemplating their purchase. Indeed, there are many “educational” campaigns operating at the national and international levels, though there is no empirical evidence on how successful they are in limiting IPRs violations.

71. As a final caveat, it is worth acknowledging that appropriate funding of competent government agencies is a necessary, but not sufficient prerequisite for effective IPRs enforcement. In some countries, such agencies may be ineffective, or public entities may themselves be engaged in counterfeiting or piracy (or using IPRs-infringing products). For example, military bases in Russia have been alleged to host optical disk plants which manufacture and distribute pirated audiovisual products.<sup>38</sup> Institutional deficiencies often prevail at the level of states and municipalities, over which federal governments may have little control. It is difficult to give general recommendations on how to overcome such institutional deficiencies. They are often country-specific and may be rooted in broader government failures, to the extent that poor IPRs enforcement may be the “fifth wheel of the coach.”

## 6. CONCLUSION

72. What are the practical policy implications of the approach outlined in the previous section? Admittedly, policymakers may be forgiven in finding the advice of “equating marginal benefits associated with enforcement activities to their marginal costs” unhelpful. Welfare considerations suggest that governments should focus their enforcement efforts on cases of deceptive trademark infringements (the first row in Table 1), especially those that create health and safety risks. In addition, a case can be made for pursuing producers rather than small-scale distributors of illicit goods, especially where the former are linked to organized crime syndicates. To some extent, policy choices will also need to rely on the

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<sup>38</sup> See the “2006 Special 301 Report” submission on Russia by the International Intellectual Property Alliance (available at <http://www.iipa.com/rbc/2006/2006SPEC301RUSSIA.pdf>).

judgments of local law enforcement authorities, who are often best placed to assess what types of enforcement actions are most effective.

73. What do the economic considerations outlined in this paper imply for IPRs enforcement policy in developing countries? To begin with, the domestic incentive to devote substantial resources to fighting counterfeiting and piracy is bound to be smaller in developing countries. Governments in such countries typically face other priorities for public spending. In addition, most IPRs-holders tend to be of foreign origin, suggesting that the short-run benefits of stepped-up IPRs enforcement are likely to be limited—except where domestic consumers are harmed (such as in the case of counterfeit pharmaceuticals).<sup>39</sup> Only as countries reach a certain threshold level of income and domestic IPRs ownership becomes more widespread will the domestic incentive for fighting counterfeiting and piracy grow.<sup>40</sup>

74. Yet precisely because most IPRs holders are foreigners, usually from OECD countries, developing countries will invariably face trade and foreign policy pressures to rein in IPRs violations. The TRIPS Agreement introduced minimum standards for the enforcement of IPRs, including certain civil and administrative remedies, provisional measures, border measures, and criminal procedures that WTO members must have in place. It is unclear to what extent these standards have caused significant changes in developing countries' enforcement policies. Many countries probably complied with the TRIPS enforcement requirements before the Agreement came into force and there are important flexibilities in the implementation of these requirements—such as the 'distribution of resources' caveat, quoted in Section 4.<sup>41</sup>

75. Enforcement obligations in recent bilateral and regional FTAs are more stringent. For example, US FTAs go beyond TRIPS requirements in several areas: they expand the scope of border measures, lower the threshold of forms of IPRs violations that constitute a criminal activity, and do not provide for a 'distribution of resources' caveat along the lines of the TRIPS Agreement (see Fink and Reichenmiller, 2005). Similarly, the envisaged Anti-Counterfeiting Trade Agreement (ACTA) specifically seeks to establish "*new international norms, helping to create a new global gold standard on IPR enforcement*".<sup>42</sup> Recent initiatives in other forums—such as WIPO, the TRIPS Council, the World Customs Organization, Interpol, and the World Health Organization—aim in the same direction.<sup>43</sup>

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<sup>39</sup> Baroncelli et al. (2005) document that foreign residents account for 46 percent of trademark registrations in middle income countries and 81 percent in low income countries. However, the propensity of trademark violations is arguably higher for better known foreign trademarks.

<sup>40</sup> More generally, Maskus (2000) has documented a U-shaped relationship between the strength of IPRs protection and the level of economic development. At the lowest levels of development, rising incomes lead countries to weaken IPRs protection, as they develop imitative capacity. This trend is reversed once domestic firms create IPRs themselves and demand their protection.

<sup>41</sup> See UNCTAD-ICTSD (2005) for a detailed legal review of the TRIPS enforcement provisions.

<sup>42</sup> See the press release by the European Commission available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1573>

<sup>43</sup> See Biadgleng and Munoz Tellez (2008) for a review of these initiatives. It is worth noting that there is a certain asymmetry in international enforcement obligations. Existing international agreements and current initiatives seek to strengthen the enforcement of private rights. By contrast, there are no international obligations to enforce laws against the abuse of these rights—for example, in the form of erroneous patent awards for subject matter already in the public domain or anti-competitive business practices associated with intellectual property ownership.

Implementing “TRIPS-plus” enforcement obligations will likely require governments to devote additional resources towards fighting IPRs violation. There is little evidence available that could guide policymakers on the precise resource implications of different kinds of treaty obligations. This knowledge gap arguably represents an important area for future research. In particular, it would be important to quantify the budgetary costs of different kinds of enforcement activities. Case studies of countries that strengthened their enforcement regime would be especially helpful.<sup>44</sup>

76. If resource shifts associated with the implementation of international treaties do not reflect domestic priorities, public spending in affected countries would be distorted. This concern raises the question of whether stepped-up IPRs enforcement in less developed countries should not be financed by rich country governments. Since developed country firms derive a direct benefit from stronger IPRs enforcement, it may indeed be in the interest of their governments to subsidize IPRs enforcement activities in developing countries. The case for subsidies seems especially strong when law enforcement activities target international crime syndicates and thereby limit the flow of counterfeit and pirated goods into rich country markets. In addition, rich country financing may be coupled with technical cooperation between national law enforcement authorities, which may lead to the transfer of valuable know-how to IPRs enforcement agencies in developing countries (to the extent that such know-how is applicable in a developing country context).

77. From the viewpoint of developing countries, one concern with rich country financing is that it may crowd out development aid in areas where the purely domestic pay-offs to such aid may be higher—say, investments in health and education. Indeed, questions of intellectual property protection do not feature prominently in countries’ Poverty Reduction Strategy Papers (PRSPs), which are supposed to provide the basis for the allocation of international development assistance.<sup>45</sup> Of course, the allocation of development aid is ultimately a decision of the donor country and it may be driven by altruism as well as self-interest.

78. Another approach would be to have enforcement costs borne by private rights holders. Arguably, fully privately funded law enforcement would be economically second-best, because at least some consumers benefit from stronger enforcement action (see Table 1) and should therefore share the costs of the public good represented by law enforcement activities. However, private rights holders are the most direct beneficiary of better enforcement and they can therefore be expected to make a substantial contribution to the financing of underlying costs. In the case of trademarks and patents, governments could charge a special levy upon registration and renewal of intellectual property titles.<sup>46</sup> The size of the levy could depend on the market capitalization or sales revenues of firms in a given country, so that levies do not discriminate against small enterprises that face comparatively fewer infringements of their intellectual property. In poorer countries where the most ‘valuable’ intellectual property assets are held by foreigners, this approach would imply substantial foreign financing of

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<sup>44</sup> Such case studies have been conducted for other treaty negotiations. For example, the World Bank has established a technical assistance facility to assist developing countries assess the cost implications of a new agreement on trade facilitation in the WTO. See <http://go.worldbank.org/VKY547AFU0>.

<sup>45</sup> An electronic search of more than 50 national PRSP documents published between 2000 and 2007 revealed that the terms “intellectual property”, “copyright”, and “trademark” are not at all mentioned in these documents. (See <http://www.imf.org/external/np/prsp/prsp.asp>).

<sup>46</sup> Maskus (2006) makes a similar proposal.

domestic enforcement costs. At the same time, as domestic firms grow and develop their own intellectual property portfolios, the domestic financing share would rise. In the case of copyright, the levy approach may not be feasible, because in most jurisdictions copyright protection does not necessitate the registration of copyrighted works. That said, copyright piracy is concentrated in a relatively small number of industries and it should be possible to impose “lump-sum” enforcement taxes on companies benefiting from stronger law enforcement actions.<sup>47</sup>

79. As a final remark, if weak IPRs enforcement in developing countries reflects fundamental institutional deficiencies, it is not clear how far obligations in trade agreements or technical assistance activities can at all remedy such deficiencies. The record of aid agencies in changing institutions in developing countries is, at best, mixed. Historical evidence and contemporary research suggests that institutional change occurs only gradually and is more frequently brought about by bottom-up evolution rather than top-down planning (see Easterly, 2008). Outside incentives—whether positive or negative—may well make a difference in containing counterfeiting and piracy activities and their international proliferation. However, in many cases, sustained reductions in IPRs violations may invariably have to wait for broader institutional development.

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<sup>47</sup> Lump-sum taxes—such as the proposed levy on the registration and maintenance of trademarks and patents—should have no direct bearing on consumer prices. By contrast, if taxes were to take the form of sales levies, companies would pass at least part of the tax onto consumers through higher product prices.

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