Striking a Balance between Competition Law Enforcement and Patent Policy: A Developing Country's Perspective

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STRIKING A BALANCE BETWEEN COMPETITION LAW ENFORCEMENT AND PATENT POLICY: A DEVELOPING COUNTRY’S PERSPECTIVE

Thomas K. Cheng*

1. Introduction

The intersection of competition law and intellectual property rights (IPRs) is one of the most complex areas of competition law. These two areas of law share a potentially conflicting relationship, as competition law restricts the abuse of substantial market power while IPRs may confer market power. Commentators in developed countries have proposed various ways to resolve this conflict. Some of them give primacy to competition law, while others emphasize the importance of protecting IPRs. Yet some others advocate solutions that require balancing the policy considerations underpinning these two bodies of law, while scholarship from developed countries is didactic on how developing countries should resolve this conflict. In a well-known article in 1984, Louis Kaplow proposed a complex analytical framework for balancing the conflicting policy goals of competition law and patent policy. (See generally Kaplow, supra note 785.) Developing countries

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785 Kaplow characterizes the intersection of competition law and patent law in particular as “a source of perpetual confusion and controversy” and as a conflict “even more deep-seated than is generally perceived”. The Patent-Antitrust Intersection: A Reappraisal, 97 Harv. L. Rev. 1813, 1815–16 (1984).

786 Ward Bowman, Jr. was one of leading proponents of minimal competition law restrictions on the exercise of IPRs, while William Baxter advocated a stronger role for competition law in regulating the exercise of patent rights. See generally Ward S. Bowman, Patent and Antitrust Law (1973); William F. Baxter, Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis, 76 Yale L.J. 267 (1966).
must be mindful of their own unique policy considerations. The main justification for protecting IPRs, especially patents, is to generate incentives to innovate. This justification is persuasive in developed countries, where most of the potential inventors in the world are located. It carries much less weight in developing countries, most of which possess limited capacity to innovate. In resolving the conflict between competition law and IPRs, developing countries must recalibrate the balance struck by developed countries.

Although all the major IPRs grant their owners some proprietary rights, the focus of this research is primarily on patents. Of the three major types of IPR — patents, copyrights and trademarks — patents grant the strongest protection. A patent gives a patentee the exclusive right of exploitation, which entitles the patentee to exclude others from copying or commercializing an invention that falls within the scope of the patent. Patents are also more likely than copyrights and trademarks to endow their owners with substantial market power. As will be discussed in greater detail later, whether an IPR creates market power, and hence potentially raises competition law issues, crucially depends on the availability of substitutes for the product incorporating the protected intellectual property. In the absence of substitutes, the producer of such a product will wield substantial market power. An example will illustrate this point. Assume that a patentee has obtained a patent on a new drug that cures a rare disease. The patented drug is currently the only cure for that disease. Under these circumstances, the patentee will possess substantial market power in the market for treatment for that rare disease. In practice, it is not altogether rare for a patented technology to be the only one capable of performing a certain function or possessing a unique quality desired by consumers. Patent protection of such a technology would create market power and raise competition law issues.

In comparison, with the exception of software copyrights, copyrights are less likely to create substantial market power. This is

787 The focus here is on competition law issues in product markets incorporating intellectual property, and not on technology markets and innovation markets. While the latter two are undoubtedly important, the economics literature and legal thinking on them still remain to be developed. Moreover, these two types of markets are likely to have less salience for developing countries.

788 In many ways, software is different from other types of materials that are copyrightable in that software is mostly valued for its functionalities and not its
due to the fact that copyrights offer a narrower scope of protection\textsuperscript{789}. While a patent prohibits an unauthorized third party from replicating a protected technology, even if that is done with no assistance from the patentee or with no knowledge of the patentee’s know-how, copyright protection poses no bar to independent creation of protected content. Copyright law merely prohibits a third party from copying and reproducing the content created by the copyright holder. Moreover, copyright-protected materials rarely constitute the only product in a relevant market. Even in the case of most popular fiction, a novel such as \textit{The Da Vinci Code} is but one of many popular adult thriller novels in the market. If the price of \textit{The Da Vinci Code} doubled, some readers might switch to other novels, or to other forms of entertainment, such as films or music, altogether.

Trademarks are similarly unlikely to give rise to substantial market power. A trademark rarely possesses such unique qualities that it faces no competition from other trademarks. It is important to distinguish between the substitutability of the trademark and that of the underlying product. One may argue that a desktop computer operating system bearing the Microsoft mark has few meaningful substitutes. However, it is the underlying product of a desktop computer operating system, not the Microsoft mark that lacks substitutes. Presumably, if Windows were manufactured by, say, Sun Microsystems instead of Microsoft, consumers would be happy to purchase it from Sun. Two prominent U.S. competition law commentators have concluded that “\textit{IP other than patents, secret know how or software copyrights, is unlikely to yield sufficient economic power to give (sic) rise to serious Section 2 [monopolization] issues\textsuperscript{790}}.” In light of the preceding discussion, the focus is on the conflict between competition law enforcement and patent policy.


At this juncture, it is important to clarify the scope of this research. It does not address the relationship between competition law and economic development. The question of whether competition law enforcement may promote economic development has received considerable attention in recent years. It has been argued that by improving consumer welfare and encouraging domestic enterprises to become more efficient, competition law enforcement helps developing countries to progress economically. It is certainly possible that the balance between competition law enforcement and patent policy may have general implications on development, and that possibility is itself a worthwhile object of research. However, the scope of this research is narrower. It is confined to how developing countries should strike a balance between competition law enforcement and patent protection as a matter of sound competition policy, taking into account both allocative and dynamic efficiency considerations. The perspective adopted is one of competition law, and not one of development.

Part 2 explains the prevalent views in developed countries on the intersection of competition law enforcement and patent policy, with a special focus on the framework advocated by Louis Kaplow. Part 3 examines the problems with applying Kaplow’s framework to developing countries, and suggests necessary modifications based on lessons from development economics literature. Part 4 reviews some practical issues arising from the implementation of the modified framework and suggests how developing countries may use this framework to help them balance competition law enforcement against patent policy.

2. The balance between competition law enforcement and patent policy in developed countries

The fundamental cause of the conflict between competition law enforcement and patent policy lies in the fact that competition law restrains the abuse of substantial market power that patents sometimes create. Competition law constrains a dominant firm’s choice of competitive conduct. As the European Court of Justice (ECJ) has repeatedly asserted, a dominant firm bears a special responsibility towards the competitive process. While the U.S. courts have

791 In Michelin, the ECJ stated that a dominant firm “has a special responsibility not to allow its conduct to impair genuine undistorted competition” in the market.
generally given dominant firms greater freedom of action, \(^{792}\) it is nonetheless true that in U.S. antitrust jurisprudence, there exists a class of competitive conduct that a firm without market power is free to pursue, but which may ran afoul of competition law when undertaken by a dominant firm \(^{793}\). Meanwhile, by granting a patentee the exclusive right to exploit an invention for a certain period of time, a patent may give rise to market power. The existence of market power must be determined on a case-by-case basis. As discussed earlier, one of the main determinants is whether there are close substitutes for a patented product. Early U.S. case law suggested that patent ownership created a presumption of market power on the part of the patentee \(^{794}\). This presumption had long been criticized by economists and competition law scholars as being inconsistent with economic reality. In 1995, the U.S. Department of Justice and the Federal Trade Commission announced in the *Antitrust Guidelines for the Licensing of Intellectual Property* that they would not, as a matter of enforcement policy, apply this presumption to a patentee \(^{795}\). Finally, in 2006, the U.S. Supreme Court adopted the same view in the Illinois Tool Works case \(^{796}\). After elucidation of the fundamental cause for the conflict between competition law enforcement and patent policy, what follows is a review of the divergent approaches suggested by commentators to resolve the conflict.

### 2.1. Patent policy trumps competition law enforcement

Some commentators have suggested that patent policy trumps competition law conflict. Bowman is a prime example. His competitive superiority test “assumes the propriety of allowing a patentee to use any method of charging what the traffic will bear if, and only if, the reward to

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the patentee arising from the conditional use measures the patented product’s competitive superiority over substitutes”\textsuperscript{797}. This test favours patent policy by giving a patentee enormous freedom of action. Under this test, “a licensee’s or buyer’s willingness to accept a restriction as a condition” to a patent licensing transaction is treated “as affirmative evidence of legitimacy”\textsuperscript{798}. In fact, according to Kaplow, Bowman’s test is so permissive that “pure horizontal cartelization is virtually the only behavior he would prohibit”\textsuperscript{799}.

Régibeau and Rockett propound a similarly pro-patent view. They advocate for “independence” of patent law from competition law enforcement. In particular, they argue that “competition law should respect the rights granted by (intellectual) property law and that the trade-off between static and dynamic efficiency is not a primary concern of competition law”\textsuperscript{800}. They provide two main justifications for their position. First, they argue that patent law, and intellectual property law generally, has struck an appropriate balance between static efficiency and dynamic efficiency considerations, with which competition law should not tinker\textsuperscript{801}. Second, they argue that patent law focuses on the \textit{ex ante} incentives to innovate whereas competition law evaluates the competitive effects of a business practice \textit{ex post}. More information is always available in the \textit{ex post} scenario, when competition law intervenes. With the benefit of hindsight, a competition authority often will be tempted to take away the rewards that induced an inventor to pursue the innovation \textit{ex ante}. In fact, Régibeau and Rockett assert that “the optimal level of monopoly power \textit{ex post} is none”\textsuperscript{802}. However, falling for this temptation would “wreck the delicate balance achieved by \textit{IP law}”\textsuperscript{803}.

\textsuperscript{797} Bowman, \textit{supra} note 786, at x; \textit{see id.} at 88.
\textsuperscript{798} Kaplow, \textit{supra} note 785, at 1849–50.
\textsuperscript{799} \textit{Id.}
\textsuperscript{800} Régibeau & Rockett, \textit{supra} note 789, at 524.
\textsuperscript{801} \textit{Id.} at 523.
\textsuperscript{802} \textit{Id.} at 524.
\textsuperscript{803} \textit{Id.}
2.2. Competition law enforcement trumps patent policy

Another common view is that competition law enforcement takes precedence over patent policy, although this view is usually asserted less forcefully than is the patent primacy view. One of the early proponents of this view is Baxter, who put forward the comparability test as a solution to the competition law–patent conflict. Under this test, competition law should ensure that a patentee receives benefits that are roughly comparable to the ultimate value of the patent. Kaplow characterizes Baxter’s test as reflecting “a bias toward minimizing the infringement upon antitrust policy” and as tending “toward results favoring [the] antitrust side of the conflict.” In a variety of contexts, the U.S. Supreme Court has expressed a similarly pro-antitrust view. In *Kodak v. Image Technical Services*, the Court, addressing the issue of leveraging monopoly power from one market to another, stated that “power gained through some natural or legal advantage such as patent, copyright, or business acumen can give rise to liability if a seller exploits his dominant position in one market to expand this empire into the next.”

On the other side of the Atlantic, the European Community courts have propounded similar views favouring competition law in a number of landmark refusal-to-deal cases. In the Court of First Instance (CFI) Microsoft decision, the CFI concluded that the fact that Microsoft’s workgroup server interoperability information was protected by patent and trade secret laws did not relieve the company’s refusal to supply competitors with such information from competition law scrutiny. Under certain conditions, “an undertaking in a dominant position may be required to grant a license covering its intellectual property rights.” In *IMS Health v. NDC Health*, the ECJ laid down the conditions that must be established to compel a dominant firm to license its IPRs to competitors: first, the refusal to license prevents “the emergence of a new product for which there is a potential consumer demand”, second,

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804 Baxter, *supra* note 786, at 313.
808 *Id.* at para. 290.
the refusal “is unjustified”, and third, the refusal excludes “any competition on a secondary market”\(^809\). Two observations of this judgment are in order. First, even though the IPR at issue in the IMS case was a copyright and not a patent, the ECJ did not limit its conclusions to copyrights. The ECJ spoke of IPRs generally in the judgment\(^810\). The ECJ’s characterization of an intellectual property that may be subject to a special duty to supply is also more reminiscent of a patent than of a copyright. The ECJ asserted that only an intellectual property that is indispensable to competitors’ ability to compete with the dominant firm is subject to this duty\(^811\). The ECJ defined indispensability by the following two criteria: “whether there are products or services which constitute alternative solutions, even if they are less advantageous, and whether there are technical, legal or economic obstacles capable of making it impossible or at least unreasonably difficult for any undertaking seeking to operate in the market to create, possibly in cooperation with other operators, the alternative products or services”\(^812\). Copyrighted materials rarely enjoy such a degree of indispensability; patented subject matter is more likely to do so. Therefore, the ECJ’s statements in IMS are likely to apply with equal force to patented products. The CFI’s invocation of the IMS criteria in the Microsoft case, which involved patent and trade secret protection, corroborates this view.

The second observation is that the three conditions laid down in the IMS case are very stringent and the judgment therefore should not be read as an unequivocal endorsement of the competition law primacy view. However, the fact remains that the European Community courts have generally taken a pro-competition law stance on the conflict between competition law enforcement and patent policy. This is all the more apparent when one compares the European Community’s approach to refusal to license IPRs to that in the U.S., where some have argued for a per se right to refuse to license\(^813\).

\(^{810}\) Id. at para. 23, 25.
\(^{811}\) Id. at para. 28–29.
\(^{812}\) Id. at para. 28.
\(^{813}\) SULLIVAN & GRIMES, supra note 790, at 848–53.
2.3. Striking a balance by weighing allocative efficiency losses against dynamic efficiency gains

While there are some merits to the views that either competition law enforcement or patent policy should reign supreme, these are nonetheless overly simplistic. Kaplow has insightfully pointed out the deficiencies in Bowman’s and Baxter’s tests, which will not be repeated here. Moreover, the assertion by Régibeau and Rockett that competition law should not be concerned with balancing static efficiency with dynamic efficiency is plainly mistaken. Competition law regularly takes into account the effects of a business practice on innovation, and balances dynamic efficiency against static efficiency. Merger review is one prime example. It would be untenable to argue that competition law should ignore dynamic efficiency considerations only in its interface with patent policy, which is arguably the area of competition law in which these considerations are the most important. These commentators fail to take into full account the fact that both competition law and patent law incorporate allocative efficiency and dynamic efficiency considerations. A sensible resolution of the competition law–patent conflict would require a careful balancing of these considerations.

Despite their different purposes, both competition law and patent law take into account allocative efficiency and dynamic efficiency considerations, albeit with different emphases. Competition law is primarily focused on allocative efficiency, i.e. ensuring that consumers obtain the goods they desire the most at the lowest possible price and that producers produce the goods that consumers desire in the most cost-efficient manner. However, competition law recognizes the importance of dynamic efficiency and the fact that the most significant improvement in consumer welfare often results from technological innovations that give rise to new or better products, and not from keener competition in the provision of existing products. Therefore, as mentioned earlier, competition authorities and courts do consider gains in dynamic efficiency when assessing the competitive effects of a business practice. Patent law grants exclusivity in exploitation in order to induce potential inventors to innovate. This exclusivity results in losses in allocative efficiency, because patented products are likely to be produced below the competitive level. However, these losses are

814 See Kaplow, supra note 785, at 1845–55.
815 For a more detailed discussion of this issue, see id. at 800–07.
deemed to be the necessary price that must be paid to induce innovations. The balance to be struck in patent policy is how to offer potential inventors sufficient incentives without incurring excessive losses in allocative efficiency. Therefore, both bodies of law balance allocative efficiency against dynamic efficiency, which forms a useful starting point for the resolution of the conflict between them.

Having established a common ground between competition law and patent law, it remains to be seen how precisely this common ground can be used to resolve the conflict between them. Kaplow provides the most elegant framework for the resolution of this conflict. Two fundamental premises underpin Kaplow’s framework. First, there are two main policy dimensions to the competition law–patent conflict — the length of the patent term and the scope of patent protection and permissible exploitation, the latter of which is governed by a variety of patent and competition law rules. Second, society should set the first dimension by maximizing the net social benefits of granting patent protection, and the second dimension by comparing the reward that redounds to a patentee from adjusting a particular rule on patent exploitation with the allocative efficiency loss resulting from the adjustment. The second dimension, which is the principal concern of this research, is set taking the optimal patent life as given, even though the two dimensions ideally should be determined simultaneously.

With respect to the second dimension, the fewer and the more lax are the restrictions imposed by competition law on patent exploitation, the greater is the patentee reward from an invention, and therefore the greater is the inducement to potential inventors. With respect to the first dimension, the net social benefits of patent protection are maximized when the difference between the total social benefits and the total social costs of patent protection is the greatest. This difference is maximized when the marginal social benefit of patent protection equals its marginal social cost. The social benefits of patent protection include the consumer welfare derived from the emergence of a new

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816 The following discussion is based on Kaplow’s article, “The Patent-Antitrust Intersection: A Reappraisal”. Unless otherwise indicated, the ideas are attributed to pp. 1821–1845 of that article, supra note 785.
817 Although he does not discuss the possibility, Kaplow’s model presumably can be used to determine other dimensions to the scope of patent protection, such as the breadth of the patent misuse doctrine.
product or the improvement of an existing product, and the possible future inventions that are built upon the current invention. The most important social cost of patent protection is the deadweight loss resulting from the exclusive exploitation of a patent. Exclusive exploitation is likely to result in production below the competitive level. Whenever that happens, society suffers a loss in allocative efficiency, known as the deadweight loss.

The pivot of Kaplow’s framework is the ratio test, which is defined as patentee reward divided by monopoly loss. This test is used to determine the second dimension discussed above, i.e. whether competition law should permit a particular patent exploitation practice, such as an exclusive license. Patentee reward and monopoly loss refer to the incremental reward and loss from allowing the patent exploitation practice at issue. When setting the optimal patent life, the policy maker will implicitly also determine an optimal patentee reward–monopoly loss ratio, which represents the reward–loss trade-off made when extending the patent life by the last incremental year. The implicit determination is explained by the fact that the marginal social benefit of patent protection is dependent on the incremental patentee reward, and the monopoly loss is one very important component of the marginal social cost of patent protection.

Once the optimum patent life has been set, what the ratio test seeks to answer is “whether the total reward to the patentee implicit in the optimal patent life can be achieved at a lower cost”\(^8\). The answer is obtained by comparing the ratio associated with a particular patent exploitation practice with the optimal ratio. A patentee reward–monopoly loss ratio can be computed for every patent exploitation practice\(^9\). The optimal ratio represents the most cost-effective way in which society can induce inventions by adjusting patent life. If the ratio for a particular patent exploitation practice is lower than the optimal ratio, the practice

\(^8\) Kaplow, supra note 785, at 1831.
\(^9\) Strictly speaking, there is a ratio associated with every patent exploitation practice for every patent, because patentee reward depends on “a number of factors, including the market value of the invention, the structure of the market involving the patented process or product, and the attributes of the patentee (such as marketing and production capacities) that determine its range of options within that market.” Id. at 1823. However, for ease of application, it is assumed that there is a generalized ratio for every type of patent exploitation practice.
should be prohibited. Society would be better off prohibiting the practice at issue and keeping the last incremental year of patent life. If the ratio for a particular patent exploitation practice is higher than the optimal ratio, the practice should be allowed, subject to the requirement that patent life should accordingly be shortened. Society would be better off obtaining the incremental patentee reward by allowing a particular patent exploitation practice than by granting the last incremental year of patent protection.

Despite the theoretical elegance of his model, Kaplow himself acknowledges that there are considerable obstacles to applying his model in real-world contexts. First and foremost, the optimal patentee reward—monopoly loss ratio that serves as the benchmark for comparison is very difficult to ascertain. Kaplow remarks that “our knowledge is inadequate to inspire great confidence even in the desirability of having a patent system at all, much less in the ability to make the subtle measurements of marginal effects that determine the ratio implicit in the optimal patent life.”\textsuperscript{820} As a second-best solution, Kaplow proposes a cost-effectiveness analysis, which requires the competition authority to derive the ratios for all possible patent exploitation practices and align them from the highest to the lowest. A comparison can then be made of the practices that are currently allowed and prohibited to ensure that the total patentee reward is obtained from practices that have the highest ratios. This analysis is so named because the goal of the exercise is to obtain the same total reward in the most cost-effective manner, i.e. by incurring the least aggregate monopoly loss.

Even this second-best formulation of his ratio test, however, is too difficult to apply. Therefore, Kaplow suggests a number of factors that can be used as proxies to facilitate the application of the test. These factors include “the extent to which the reward is pure transfer, the portion of the reward that accrues to the patentee, and the degree to which the reward serves as an incentive.”\textsuperscript{821} The first of these factors requires some explanation. By a pure transfer, Kaplow refers to a situation in which a patent exploitation practice results in transfer of surplus from one group in society to another, such as licensees to the licensing patentee, without an attendant increase in deadweight loss. In

\begin{itemize}
  \item \textsuperscript{820} \textit{Id.} at 1833–34.
  \item \textsuperscript{821} \textit{Id.} at 1842.
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the case of a pure transfer, the patentee reward may increase substantially without a corresponding increase in monopoly loss. Therefore, all else being equal, a patent exploitation practice that results in a pure transfer is to be preferred to one that does not.

Given the difficulty in quantification, in the concrete applications of the ratio test in his article, Kaplow does not attempt to calculate any ratios. Instead, he analyses qualitatively the effects of a patent exploitation practice on the ratio’s denominator and numerator. This is often done with reference to the three factors mentioned in the last paragraph. If a practice is likely to result in a substantial increase in the numerator, patentee reward, without an attendant substantial increase in the denominator, monopoly loss, Kaplow concludes that competition law should permit it. An example would be a practice that results in a pure transfer. If a practice is likely to result in a substantial increase in the denominator without an attendant increase in the numerator, competition law should prohibit it. An example would be a price-fixing cartel disguised as a licensing arrangement with price restrictions.

Even though Kaplow’s ratio test and its alternative formulations are difficult to apply in practice, they provide useful insights into how the balance between competition law enforcement and patent policy should be attained. When assessing a patent exploitation practice, a competition authority must consider both its effects on patentee reward and hence innovation incentives, and its social costs in the form of deadweight loss. This insight proves to be useful in balancing competition law enforcement and patent policy in developed and developing countries alike.

3. The balance between competition law enforcement and patent policy in developing countries

3.1. Adapting Kaplow’s model to developing countries — relevant considerations

Having introduced an analytical framework for balancing competition law enforcement and patent policy in developed countries, it is important to articulate why adjustments are needed to adapt Kaplow’s framework to the developing country context. At this point, one should
recall that one of the basic premises of Kaplow's framework is that patentee reward induces potential inventors to engage in research and development. The ratio test compares patentee reward against monopoly losses resulting from allowing a particular patent exploitation practice. The underlying policy judgment is that some static efficiency loss in the form of monopoly loss should be sustained to generate patentee reward to induce innovative activities. However, depending on the country at issue, what is a sound policy decision in the context of a developed country may not be so in a developing country. As noted by Correa, "the static-dynamic efficiency rationale applicable to a developed country does not necessarily hold in low income countries".\(^{822}\) In the case of least developed countries, "the present sacrifice of static efficiency finds no justification in future gains of dynamic efficiency as domestic innovation is unlikely to occur and foreign innovation depends on larger markets in developed countries".\(^{823}\)

The fundamental reason that Kaplow's framework requires adaptations is that, oftentimes, the potential inventors are not located in developing countries, but in developed countries. This is especially true of countries with little capacity to innovate. The implications of this are twofold. The first concerns the domestic welfare impact of favouring patent policy. Increasing patentee reward by adopting more permissive competition law standards for patent exploitation practices may not spur innovation in some developing countries because there may not be any potential inventors to whom to provide incentives. These developing countries may legitimately question whether the trade-off of between allocative efficiency and dynamic efficiency is worth making. Moreover, adopting more permissive competition law standards for patent exploitation practices may impede domestic producers’ ability to imitate a foreign technology. For instance, under a stringent competition law standard — one that imposes significant restrictions on a patentee’s freedom of action — a developing country may make it easier for domestic firms to obtain a compulsory licence from a foreign patentee. This could be achieved by adopting a liberal interpretation of the

\(^{822}\) Carlos M. Correa, Intellectual Property and Competition Law—Exploring Some Issues of Relevance to Developing Countries, ICTSD INTELLECTUAL PROPERTY AND SUSTAINABLE DEVELOPMENT SERIES ISSUE PAPER NO. 21, 6 (2007).

\(^{823}\) Id.
essential facilities doctrine, as is advocated by Correa. Such a policy, which favours competition law enforcement, will enhance a developing country’s imitative capacity. Adopting a contrary policy in the name of promoting dynamic efficiency will hurt domestic imitative capacity. Whether this is a relevant consideration depends on the extent of imitation taking place in a particular developing country.

The second implication concerns the international incentive effects of favouring patent policy. With the exception of a few developing countries, potential inventors are much more likely to be found in developed countries. Therefore, favouring patent policy will only increase reward to foreign patentees and induce foreign inventors to innovate. A developing country may justifiably ask whether and why it should sacrifice domestic consumer welfare and perhaps imitative capacity in favour of foreign inventors, especially those in developed countries. Even if the answer is in the affirmative, the competition authority of a far-flung developing country may still wonder whether a potential inventor in a developed country would take into account the incentives provided by its competition law regime. The answer to this question will depend on the size of the economy of the developing country at issue, among other factors.

If adjustments were to be made, would one set of adjustments suffice? The answer seems to be no. Correa’s comments crucially suggest that developing countries cannot be treated as a monolith. The question is how one should categorize developing countries for our present purpose. In order to do so, one must distinguish between production capacity, imitative capacity, and innovative capacity. The

824 Correa, supra note 822, at 8–13.
meaning of the first and the last capacities should be apparent. Regarding the second capacity, economists have observed that imitation itself requires considerable know-how and human capital. Therefore, some developing countries may only have the technical capacity to produce and not to imitate.

Some developing countries may have little imitative and innovative capacities, and only engage in production of the simplest kind. The least developed countries are examples of such countries, which may be called “production” countries. Some developing countries may possess both production and imitative capacities, but not innovative capacity. Even though imitation requires know-how and human capital, the technological sophistication required for innovation is higher than that required for imitation. Therefore, some developing countries may only possess the technical capabilities to imitate and not to innovate. Most developing countries are likely to belong to this category of “imitation” countries. Finally, some developing countries may possess all three capacities. South Korea, with its prominent electronics and shipbuilding industries, and Taiwan, with its strength in the computer and the semiconductor sectors, come to mind. China, which has become one of the top five countries of origin for Patent Cooperation Treaty applications at the World Intellectual Property Organization (WIPO), is another example. These countries may be called “innovation” countries. The importance of patentee reward in Kaplow’s ratio test, and more generally, the importance of dynamic efficiency considerations in the competition law–patent balance, understandably differs for various categories of developing countries. The balance must be struck differently for each of them.

3.2. Review of economics literature

To understand precisely the kind of adjustments needed to be made to Kaplow’s framework, it is didactic to consult relevant economics literature. Unfortunately, there is scant economics literature that examines the relationship between the competition law–patent balance

and the incentive to innovate in developing countries. However, based on stylized models, economists have studied the impact of heightened IPR protection on the incentives to imitate and innovate in developed and developing countries. Heightened IPR enforcement will render it more difficult for competitors to imitate a protected technology, hence increasing patentee reward. Even though this body of literature does not directly address the competition law–patent balance, it is nonetheless highly relevant. Recall Kaplow’s insight that adjusting the length of patent life and modifying the scope of permissible patent exploitation under competition law are two means to the same end.\textsuperscript{827} Stated more generally, as long as a policy decision raises patentee reward, whether it is made in the realm of patent policy by lengthening the patent life or by intensifying patent enforcement, or in the realm of competition law by adopting more permissive standards on potentially anti-competitive patent exploitation practices, that policy decision will boost incentives to innovate.

In keeping with the prevalent approach in the development economics literature, known as the international product cycle, Parello constructs a model, which assumes that developed countries innovate and developing countries imitate the technology created by developed countries, to study the impact of heightened IPR protection on the rate of innovation in developed countries and the rate of imitation in developing countries. Parello elaborates two scenarios, one in which imitation is the only means of technology transfer, and one in which technology transfer takes place both by imitation and through foreign direct investment (FDI).\textsuperscript{828} In his model, firms in developing countries only compete with those in developed countries by imitating the technology of the latter.\textsuperscript{829} Parello concludes that in the absence of FDI, improved IPR protection induces a short-term slowdown in the innovation rate in developed countries (even though there is no change in the long-term innovation rate), and impedes technology transfer by imitation.\textsuperscript{830} Parello does not draw any definitive conclusions regarding the rate of innovation and the rate of imitation in the presence of FDI.\textsuperscript{831}

\textsuperscript{827} Kaplow, supra note 785, at 1831–37.
\textsuperscript{828} Parello, supra note 825, at 255.
\textsuperscript{829} Id. at 260.
\textsuperscript{830} Id. at 255, 265–66.
\textsuperscript{831} Id. at 255.
One key analytical step in Parello’s model is that improved IPR protection affects producers in developing countries by raising the costs of imitation. The causal link between improved IPR protection and the costs of imitation is likely to be strong. Even though the causal link between adopting more permissive standards for patent exploitation practices and the costs of imitation may not be as strong, it is nonetheless substantial. For example, as mentioned earlier, by making it harder for domestic producers to obtain a compulsory licence from a foreign patentee, a developing country raises the costs of technology transfer to its producers and hence the costs of imitation. Moreover, by allowing a developed country patentee to use exclusive dealing arrangements to foreclose imitating domestic competitors, a developing country similarly raises the costs of imitation by making it harder for its domestic producers to market their products. The costs of imitation determine the ease and likelihood of imitation by a developing country producer. In Parello’s model and other models considered below, once a developing country producer successfully imitates a foreign technology and produces the same product to compete with the developed country patentee, the patentee’s profit from his invention falls. The patentee reward diminishes, thereby reducing a potential inventor’s incentive to innovate. Therefore, favouring patent policy in the competition law–patent balance has a similar effect to raising IPR protection in Parello’s model. The fact that the variable at issue is different does not undermine the relevance of his conclusions.

Lai supplements Parello’s analysis by examining the effect of enhanced IPR protection in developing countries on the rate of innovation in developed countries when the means of technology transfer consists of both imitation and FDI. Again, Lai assumes that only developed countries innovate and developing countries can only imitate technologies created by developed countries. When imitation is the only means of technology transfer, Lai’s conclusions are similar to Parello’s. They both find that the rate of innovation in developed countries and the rate of imitation in developing countries fall as a result of heightened IPR protection in developing countries. Meanwhile, when technology transfer is accomplished through FDI, Lai finds that both the rate of innovation and the rate of imitation rise in response to

832 Id. at 261.
833 Lai, supra note 825, at 134.
834 Id. at 135.
enhanced IPR protection in developing countries. The difference in results is due to the fact that in the former case, heightened IPR protection in developing countries will induce inventors in developed countries to invest in more innovation, raising their demand for skilled labour in their countries. Wages for these workers rise raising the costs of innovation. This increase in costs will in fact overwhelm any gains to the inventors from the enhanced IPR protection in developing countries, causing the overall rate of innovation to drop. More importantly, Lai concludes that, when technology transfer is accomplished through both imitation and FDI, the rate of innovation in developed countries and the rate of imitation in developing countries will increase in response to improved IPR protection in developing countries so long as certain conditions are met, including that the rate of FDI is sufficiently high.

Yang focuses on a different aspect of the relationship between IPR protection in developing countries and the incentive to innovate in developed countries. Yang posits that only developed countries have the capacity to create the technologies for which developing countries are the main source of demand. An example of such a technology is the cure for a tropical disease that is most commonly found in developing countries, such as malaria. The question that Yang seeks to answer is that, under these circumstances, how developing countries can induce developed country inventors to invest in these technologies by offering adequate IPR protection to these technologies in their countries. Yang finds that because of their incentive to freeride on each other's IPR protection, developing countries must cooperate with one another. One of Yang's key insights is that it is not worthwhile for a developing country to offer IPR protection to developed country technologies alone. The welfare loss from the enhanced IPR protection will more than outweigh the gains from the increased inflow of developed country technologies, given that one country’s enhanced protection will provide negligible incentives to developed country technologies.
inventors. In the ideal world, all the developing countries would cooperate to offer IPR protection to developed country technologies. Given the practical difficulties in achieving that goal, some of the developing countries should form “cooperation coalitions”\textsuperscript{843}. Countries within these coalitions offer higher protection than those outside of the coalitions\textsuperscript{844}. In fact, non-coalition developing countries are likely to lower their IPR protection to freeride on the effort of the coalition countries\textsuperscript{845}. However, once the number of countries in these cooperation coalitions is large enough, developed country inventors will receive sufficient incentives to invest in technologies needed by developing countries\textsuperscript{846}.

Yang leaves unanswered an important question, which is how one goes about deciding which developing countries should join these cooperation coalitions. Yang merely suggests that a “practical approach” would be to start with “WTO member countries”\textsuperscript{847}. He does not distinguish developing countries by their ability to induce R&D investment by developed country inventors. However, given the varying sizes of the economies of developing countries, one would most certainly expect some of them to have greater ability to induce investment by developed country inventors.

Chen and Puttitanun construct a model that examines both the imitative and the innovative capacities of a developing country. Their model includes two sectors, the import sector and the local sector\textsuperscript{848}. The import sector consists of two firms, a foreign firm from a developed country, which possesses a patented technology, and a domestic firm which competes by imitating the foreign firm’s technology\textsuperscript{849}. The local sector consists of two local firms, one of which engages in innovation and the other of which only imitates\textsuperscript{850}. The variable in the model, again, is the level of IPR protection. In this model, heightening IPR protection is a double-edged sword for a developing country. It both benefits and harms it. On the one hand, it renders it more difficult for the domestic

\textsuperscript{843} Id. at 807–10
\textsuperscript{844} Id.
\textsuperscript{845} Id.
\textsuperscript{846} Id.
\textsuperscript{847} Id. at 807.
\textsuperscript{848} Chen & Puttitanun, supra note 825, at 476.
\textsuperscript{849} Id.
\textsuperscript{850} Id.
firm in the import sector to imitate the foreign firm’s technology, thereby reducing competition in that sector\textsuperscript{851}. The price of the good in the sector increases and consumer welfare is harmed\textsuperscript{852}. On the other hand, heightening IPR protection also increases incentives for the innovative firm in the local sector to innovate, as it is now more difficult for its domestic competitor to imitate its technology\textsuperscript{853}. A developing country must balance the effects in these two sectors and find an optimum level of IPR protection.

Chen & Puttitanun’s conclusion is that the optimal level of IPR protection for a developing country is related to its level of economic development. In particular, they find that the relationship between these two variables is captured by a U-shaped curve. For a country with a low level of economic development, “an initial increase in [the] country’s technological ability has a greater impact on the efficiency of imitating northern [developed countries’] technologies than on the efficiency of domestic innovations, which makes it desirable for the country to lower [the protection of] IPRs”\textsuperscript{854}. However, at some point in economic development, the “imitation effect is dominated by the innovation effect, and the optimal protection of IPRs increases with the level of development”\textsuperscript{855}. Their empirical study shows that the bottom of the U-shaped curve — the point at which the innovation effect begins to dominate the imitation effect and developing countries should start to enhance IPR protection — is US$854.06 in per capita GDP in 1995 prices\textsuperscript{856}. This is a rather low level of development, suggesting that it is beneficial for most developing countries to enhance IPR protection.

3.3. Conclusions from the review

Recall the three types of capacity — production, imitative, and innovative — distinguished by economists and the categorization of developing countries based on their possession of these capacities proposed earlier. The discussion for now proceeds by examining the

\textsuperscript{851} Id.
\textsuperscript{852} Id.
\textsuperscript{853} Id.
\textsuperscript{854} Id.
\textsuperscript{855} Id.
\textsuperscript{856} Id. at 487.
developing countries individually, and not in the aggregate as "cooperation coalitions" as suggested by Lai. It focuses on the domestic welfare effects of a shift in the competition law–patent balance, in particular, on how such a shift affects the domestic rate of imitation and the domestic and foreign rates of innovation.

Nothing in the economic models seems to refute the obvious conclusion that the "production" countries have little to gain by favouring patent policy. Since there is no domestic innovation to be had, monopoly loss should not be traded off to increase patentee reward and to create incentives to innovate. Unless the patentee reward provided by these countries is a strong inducement to developed country inventors, these countries should favour competition law enforcement in the balance. For the remaining two categories of countries, the trade-off in shifting the competition law–patent balance is between the allocative efficiency loss plus the reduced domestic imitation on the one hand, and the increased domestic innovation on the other hand. For the "imitation" countries, since once again there is no domestic innovation to be had, they should favour competition law enforcement over patent protection. This conclusion is subject to the same caveat as that for "production" countries regarding inducements to developed country inventors. The trade-off becomes difficult for the "innovation" countries. Chen & Puttitanun suggests that these countries have much to gain from domestic innovation, even though their domestic imitative capacity suffers. These countries may strike a more neutral balance between competition law enforcement and patent protection.

The picture becomes more complicated for all three categories of developing countries if the incentive effects on developed country inventors are considered. Here, the main distinction among developing countries is whether they receive substantial foreign direct investment as a means of technology transfer. For those that do not receive much FDI, Parello’s model is most salient and suggests that favouring patent policy will give little boost to the incentive to innovate in developed countries. These countries should continue to favour competition law enforcement. For those that do receive substantial FDI as a means of technology transfer, Lai’s model is more relevant and suggests that these countries could boost the incentive to innovate in developed countries by favouring patent protection. Lastly, if one considers technologies that only developed countries have the capacity to develop — the scenario examined by Yang — one may conclude that at least
some developing countries should tilt the balance in favour of patent protection. Recall that Yang offers no guidelines on how to decide which countries should join the “cooperation coalitions”. The most one can say for now with some confidence is that developing countries with large economies are likely to offer the most substantial inducements to developed country inventors, and hence should join these coalitions. The least developed countries are likely to freeride on these large developing countries’ effort. China, Brazil and India are probable candidates for these cooperation coalitions.

In sum, both “production” and “imitation” countries with little FDI should favour competition law enforcement in the balance. “Production” and “imitation” countries with significant FDI, and “innovation” countries of all kinds need to take greater care in striking the balance. Lastly, to induce developed country inventors to create technologies required by developing countries, developing countries with larger economies may need to shoulder the responsibility to favour patent protection.

One observation here is in order regarding the causal link between a policy change and the incentive to innovate in the economic models explained above and in Kaplow’s framework. In most of these economic models, the policy decision at issue is the intensity of IPR enforcement, which determines the costs of imitation for producers in developing countries, which in turn affects the patentee reward and the incentive to innovate. Most of these models assume that once imitation begins, it is no longer profitable for the original inventor in the developed country to produce the product. The developing country producer has lower costs of production, due to its lower wage costs, and therefore can undercut the developed country producer by charging a lower price. As soon as that happens, the developed country producer will shut down its production. Therefore, a change in the intensity of IPR enforcement has a direct and immediate effect on patentee reward and the incentive to innovate.

Meanwhile, not every type of patent exploitation practice regulated by competition law has such a direct and immediate effect on patentee reward and the inventive to innovate. In fact, most of them do not. Take the practice that is likely to have the most direct impact, compulsory licensing, as an example. A developing country may adopt permissive standards for compulsory licensing that allow domestic imitators to obtain such licences from developed country inventors
easily. Such a policy obviously will have a significant impact on patentee reward, as patentees now must face competition in the market for their products. However, even under these circumstances, the extent of the impact may be less than expected. As long as the licence fee is set at such a rate that it compensates the patentee for its loss of profit from increased competition in the supply of the product, the patentee reward may not be drastically affected. In fact, the licence fee could be set at such a rate that the patentee is indifferent between commercializing the patent itself and licensing it to developing country producers. In that case, the patentee reward will not be reduced at all. One may question how likely it is that a developing country intent on providing easy access by its domestic producers to a patented foreign technology would set the licence fee at such a high level. The point remains that the causal link between adjusting competition law restrictions on patent exploitation practices and patentee reward is more tenuous than the effect of altering the level of IPR protection in the economic models examined in the previous section.

The causal link may be further weakened by the fact that a potential inventor does not look at actual reward, but expected reward, when deciding whether to undertake certain research and development. In general, a potential inventor is likely to be more aware of his/her entitlements under the patent system than of the scope of his/her permissible exploitation practices under competition law. Kaplow notes that “the wholesale abolition of patent rights would likely have a greater negative influence on expectations of reward, and hence on innovative activity, than would a severe cutback in the range of permissible licensing practices.” To sum up, even though the economic models examined in the last section suggest that strengthening IPR protection in developing countries may induce both domestic and foreign innovation, cutting back competition law restrictions on patent exploitation practices in developing countries may in reality offer weaker inducement effects than is the case in these models. The paramount conclusion from this discussion — a modification of Kaplow’s framework — is that, whatever is the appropriate competition law–patent balance in developed countries, developing countries, especially those with little innovative capacity but considerable imitative capacity or neither capacity, should tilt it more in favour of competition law enforcement. Developing countries have stronger policy justifications than do

857 Kaplow, supra note 785, at 1838.
developed countries for imposing more stringent competition law restrictions on patent exploitation practices.

4. Practical implementation of Kaplow’s framework to developing countries

The above discussion of the competition law–patent balance — both Kaplow’s original framework and the suggested modifications based on the development economics literature — still needs to be put into practice in developing countries. The obstacles to implementing these ideas are many. First, recall that Kaplow’s framework itself faces considerable practical difficulties in implementation. The patent reward–monopoly loss ratio implicit in the optimal patent life is very difficult to calculate. The alignment and comparison exercise that he calls the cost-effectiveness analysis is similarly difficult to undertake. If an advanced competition law jurisdiction with more than a hundred years of enforcement experience such as the US has difficulty applying its framework, developing countries with newly instituted competition law regimes will have little hope. However, this does not mean that the above discussion was an unproductive endeavour. The key insight from Kaplow’s framework that a competition authority must balance patentee reward and monopoly loss when assessing the legality of a patent exploitation practice remains valid. While a precise quantitative weighing of the two is unlikely to be easy, a general qualitative balancing should be the guiding principle in a competition authority’s assessment.

What about the modifications to Kaplow’s framework suggested by the development economics literature? The modifications suggested in Part 2 would require the competition authority of a developing country to take into account a variety of general economic factors, such as the imitative and innovative capacities in the country, the extent to which technology transfer is achieved through FDI as opposed to direct imitation, or even whether there is international cooperation in IPR protection in the form of “cooperation coalition” between that country and other developing countries. One may legitimately question whether any competition authority has the capability to incorporate such a wide variety of general economic factors in its analysis. One may further

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858 Kaplow, supra note 785, at 1833.
859 Id. at 1833–34.
question whether such general economic factors should determine the outcome of a case. Prohibiting a particular patent exploitation practice on the grounds that the dominant mode of technology transfer in that country is imitation may justifiably cause uneasiness.

Further complicating the matter is the fact that the dominant mode of technology transfer in any developing country probably differs sector by sector. This suggests a possible need to strike a different competition law–patent balance on a sector-by-sector basis. This need is substantiated by the fact that the existence of the three capacities likely differs not on a country-by-country basis, but on a sector-by-sector basis. Calling developing countries “production”, “imitation”, and “innovation” countries is a gross simplification. The reality is more likely to be that a developing country will possess only production capacity in some sectors, but imitation capacity in some other sectors. While a sector-by-sector approach may be most consistent with the theoretical implications of the development economics literature, it is also susceptible to allegations of inconsistent enforcement, and worse still, regulatory capture and corruption. It would be much easier for a competition authority to justify arbitrary enforcement by arguing that the same patent exploitation practice in various sectors demands disparate analysis in light of sectoral differences. This state of affairs would undermine competition law enforcement in many developing countries, where competition law is still in its early stages of development.

The most practical implementation of the lessons from the development economics literature is for the legislature of a particular developing country to calibrate the competition law–patent balance for the general economy, taking into account all the relevant factors highlighted in Part 2. This will lead to overly stringent competition law standards with respect to patent rights in some sectors but overly lax standards in other sectors. However, that is an inevitable price to pay to attain more consistent enforcement. Based on the lessons learned in Part 2, many developing countries are likely to come to the conclusion that tenuous dynamic efficiency gains do not justify substantial allocative efficiency losses and reduced imitative capacity in their countries, and are likely to impose stringent competition law restrictions on patent exploitation practices.
5. Conclusion

This research suggests a theoretical framework for calibrating the competition law–patent balance in developing countries. It takes as the starting point Kaplow’s ratio test, and asserts that modifications to the framework are needed due to the fact that most developing countries have much weaker innovative capacities than do developed countries. Canvassing the relevant development economics literature, this research suggests some modifications to be made to Kaplow’s framework, and concludes that different categories of developing countries must approach the competition law–patent balance differently. Despite this need for more nuanced approaches, overall, developing countries should favour competition law enforcement more than developed countries do in the balance between competition law enforcement and patent policy.