



INSTITUTIONS AND INTELLECTUAL PROPERTY REFORM IN DEVELOPING COUNTRIES

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Executive Summary

The years since 1990 have witnessed an international wave of reform and institutional change with respect to intellectual property rights (IPRs), driven in part by international trade liberalisation and economic transition (the latter in the former socialist countries). Many developing countries undertook new intellectual property-related commitments under various international agreements administered by the World Trade Organisation and the World Intellectual Property Organisation. These commitments are reflected in changes in domestic law and practice that tend to strengthen intellectual property rights – albeit in some cases with a significant lag and variation in application. A key element in this process is the World Trade Organisation's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), which came into effect in 1995. The TRIPS Agreement established minimum intellectual property standards and a framework to review and enforce these standards.

This wave of IPR reform continues to roll out around the world, including in a number of developing countries where the initial protection of IPRs was weak at best. In some cases, their IPR standards are beginning to approach the high levels found in the advanced economies. Moreover, the strength of IPRs is correlated with the strength of certain other key institutional variables, and some developing countries appear to be taking a strategic approach to IPR reform as one part of their larger economic development strategies. That is, improved performance in the area of IPRs may be accompanied by improved performance in other certain other areas targeted for institutional reform (*e.g.* competition policy). These developments may be contributing to better conditions for economic performance in the reforming countries. For example, some empirical studies – controlling for other factors – are pointing to a positive association of strengthened IPRs in developing countries with progress in certain other variables for economic performance including imports (*e.g.* of high technology products), foreign direct investment, technology transfer and domestic innovation, albeit with some variation by sector and country.

The global economy has become increasingly integrated as technological advances, trade and investment liberalisation, reform in transition countries, institutional change and other factors have come together to break down barriers and increase international economic possibilities. The multilateral trading system has played a major role in promotion of economic integration, in part by influencing the evolution of institutions related to intellectual property rights in developing countries. In view of the increasing globalisation of markets and the establishment of international standards for IPR protection, competitive pressures are challenging growth-oriented developing countries to address any basic shortcomings in their national IPR regimes. Conformity with the minimum global IPR standards has become, in effect, a prerequisite for developing countries wishing to access and exploit the full range of global technologies and know-how.

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Introduction

During the 1990s, a wave of institutional reform in developing countries reshaped the landscape for intellectual property rights (IPRs) due, in part, to the conclusion of the Uruguay Round of multilateral trade negotiations and the progress of economic transition in the formerly socialist countries. The World Trade Organisation's (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) came into effect in 1995 and continues to play a central role in this process. The TRIPS Agreement established minimum IPR standards and an international framework to review and enforce those standards. In parallel with the advent of TRIPS, the World Intellectual Property Organisation (WIPO) witnessed a significant increase in adherence to the various international treaties that it administers. These developments have contributed to a strengthening of IPRs around the world, including in a number of developing countries where the initial protection of IPRs was weak at best. This policy brief examines key dimensions of the institutional changes with respect to IPRs in developing countries.¹

The importance of institutions

As is underscored in a large and growing swath of economic literature, institutional reform can influence the functioning of an economy in important ways. Douglass North, in the introduction to a 1997 paper examining problems of economic transition, provides a useful summary:

“Institutions and the way they evolve shape economic performance. Institutions affect economic performance by determining (together with the technology employed) the cost of transacting and producing. They are composed of formal rules, of informal constraints and of their enforcement characteristics; while formal rules can be changed overnight by the polity, informal constraints change very slowly.”

Given that institutions are but one factor influencing the evolution of a given economy, it is useful to examine the relative importance of institutions in shaping growth. Rodrik, Subramanian and Trebbi (2002) conducted one such study, yielding a particularly striking comparison of the deep sources of economic growth. Striving to peer beyond the first-level determinants (capital accumulation -- human and physical -- and productivity change), they consider three “strands of thought” from the literature on the underlying drivers of growth. These consider geography, international trade integration and institutional quality, respectively, as central factors accounting for differences in average income levels among nations. Using a series of regressions to relate incomes to indicators for geography, integration and institutions, they find that the quality of institutions is the key factor. The institutional indicator exhibits a relatively large, positive and statistically significant relationship to income. Once the authors control for institutional quality, “integration has no direct effect on incomes, while geography has at best weak direct effects.” Moreover, in further assessments of the relationships among these variables, they find institutional quality to have a positive and significant effect on international trade integration, while trade in turn can have a positive influence on institutional quality (suggesting an indirect influence on incomes). However, the authors do not offer policy prescriptions with respect to institutions, rather citing evidence that “desirable institutional arrangements have a large element of context specificity, arising from differences in historical trajectories, political economy or other initial conditions.”

Bénassy-Quéré, Coupet, and Mayer (2007) underscore the importance of the quality of institutions in attracting foreign direct investment (FDI). They use three approaches to the analysis: first, a standard gravity model, then cross-country regression estimations drawing in part on the new and detailed *CEPII Institutional Profiles* database constructed by the French Ministry of Economy, Finance and Industry and,

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finally, a panel data assessment drawing in part on the *Fraser Institute* time-series data set. The authors conclude that host-country institutions matter as determinants of FDI, independently of gross domestic product (GDP) per capita; good institutions are almost always associated with increased amounts of FDI inflows. With respect to bureaucracy, corruption, information, banking sector and law, good institutions are especially important determinants of inward FDI. They also note that institutional convergence between host country and source country tends to help increase inflows of FDI. Summing up, the authors underscore that “[t]he orders of magnitude found in the paper are large”, meaning that moving from a low level to a high level of institutional quality can have a substantial impact on FDI.

In light of the central role that institutions appear to play in the functioning of economies, it may be expected that reform of IPR institutions would be associated with economic impacts. Technological progress plays a central role in boosting productivity (output per worker), which in turn is a first-level determinant of income levels and growth.² If inward trade, direct investment and licensing can be influenced by the strength of IPRs in an economy, then governments may be able to exploit IPR policy as one element in a broader policy framework aiming to enhance these flows. Inflows of goods, direct investment and licenses embody various types of intellectual property and represent a channel of technology transfer. Indeed, Park and Lippoldt (2008) find IPR strengthening in developing countries – particularly with respect to patents – is associated with increased technology transfer via trade and investment and with increased domestic innovative activity as measured by domestic patent filings, albeit with some variation across countries and sectors. This conclusion seems in line with the spirit of Article 7 of the TRIPS Agreement, which provides that “the protection and enforcement of intellectual property rights should contribute to the transfer and dissemination of technology.”

The nature of intellectual property

Intellectual property is differentiated from physical goods by its very nature. Unlike a material resource, a single bit of intellectual property can be made available simultaneously and repeatedly on a non-exclusive basis to multiple users, generally at a low marginal cost. Consequently, as underscored by Jones (2004) and Warsh (2006), new ideas embodied in intellectual property can contribute to technical progress with “disproportionate” impacts on economic growth. A single idea can be applied repeatedly in a non-rivalrous fashion, yielding big returns to scale. Given this economic potential, policy makers may be particularly motivated to reform policies with a view to boosting development of new domestic intellectual property³ and improving access to existing intellectual property from abroad.

IPRs provide the owners of intellectual property with legal means to prevent abuse of their rights, thereby enabling them to better capitalise on their innovations.⁴ At the same time, under the various systems governing IPRs, the rights of the owner are balanced against certain obligations (e.g. the public disclosure of certain information related to patents), limits on the extent of protection (e.g. in terms of duration of patents or copyrights, granting of research exemptions, or public health waivers) and some other constraints (e.g. with respect to anti-competitive practises in contractual licenses).⁵ Seen from an economic perspective, the incentives for innovators need to provide for an appropriate degree protection

² E.g. see WTO (2002) for a discussion and bibliographic references.

³ With respect to the literature on domestic innovation, Branstetter *et al.* (2006) note mixed findings on the impact of strengthened IPRs in reforming countries. They provide a helpful list of key references on this issue.

⁴ Due to the non-rivalrous, non-exclusive nature of intellectual property, the original innovator or subsequent rights holders may face a challenge in appropriating economic benefits from the intellectual property. Weak IPRs in a particular market may discourage a foreign rights holder from making intellectual property available there because of the potential inability to appropriate the returns from its use. Weak IPRs could be doubly damaging to the rights holder in the event a competitor makes use of the intellectual property.

⁵ WTO (2006) provides a useful summary of some of these issues in relation to the TRIPS Agreement and pharmaceutical patents.

without conferring excessive market power.⁶

The absolute size of the stock of relevant and available intellectual property appears to be an important factor in relation to productivity. As Jones (2004) notes, “Because of the non-rivalrous nature of ideas, output per person depends on the total stock of ideas in the economy instead of the per capita stock of ideas.” Since intellectual property can easily be shared across borders, the scope of the available stock can be nearly global, subject to an appropriate international framework and the willingness of rights holders to facilitate access. Singapore and Hong Kong-China are examples of economies that have overcome scale limitations in their domestic stocks of intellectual property, in part, through their integration into the global economy; among other initiatives in this regard, they have undertaken commitments with respect to the international framework agreements governing intellectual property.

The importance of IPR protection to rights holders may vary depending on the ease with which the ideas can be imitated. An exporter of specialty steel with a unique manufacturing process may not be especially concerned about patents in a particular destination market if the exported good cannot be easily reverse engineered. On the other hand, a software producer whose code can be easily copied by anyone with a laptop computer may hesitate to sell into a market where technological literacy is high and piracy is commonplace. While a goods producer in a competitive and freewheeling market may get paid the full amount of his or her marginal product, in the absence of a mechanism to protect IPRs there risks to be little or no return to the originators of ideas and hence insufficient incentives to innovate.

Developing country perspectives vary on the importance of IPRs for their economic policy frameworks. Public debate on IPRs in these countries is sometimes caught up in emotive issues such as implications for public health and access to medicine.⁷ Some critics point to significant implementation costs that can be associated with IPR commitments undertaken in the various international agreements.⁸ Correa (2005) and others have challenged the legal and economic implications of strengthening IPRs, alleging that the system of international IPR rules is imposing an undue burden on developing countries.⁹ One accusation is that the emerging standards increase the cost of intellectual content in products sought by developing countries, while developing countries may not have the capacity to capitalise on their own potential in a similar manner. Moreover, some critics allege that the bargain underlying the strengthening of the international IPR regime has not been satisfied. Namely, they feel that promises of technology transfer (e.g. as in TRIPS, Article 66.2) and FDI do not appear to be yielding adequate results for developing countries.¹⁰

⁶ In theory, overly-stringent protection could confer excess market power (e.g. if patents are too broad), thereby diminishing competition and encouraging some rights holders to continue exploiting existing innovations while postponing new innovation efforts. Encaoua *et al.* (2003) offer an extensive reference list on this issue.

⁷ At the Doha Ministerial Conference in 2001, WTO members issued the *Declaration on The TRIPS Agreement and Public Health*, to make clear their intention for the TRIPS Agreement to contribute positively to public health; see http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm.

⁸ Finger and Schuler (2001) provide an assessment of costs related to the implementation of WTO Uruguay Round commitments with respect to IPR reform.

⁹ The criticism is certainly not limited to developing country observers. Scholars such as L. Lessig and M. Boldrin and D. K. Levine have questioned the strengthening of IPRs more generally. E.g. Lessig (2002, 1999) has challenged the privatisation of the so-called “intellectual commons” and the expanded range of patentable innovation in the US that now includes such areas as Internet business methods. Boldrin and Levine (2007) recognise the need for incentives for innovation, including the right of sale with regard to innovative ideas. However, they challenge the right to regulate the use of innovations after their sale, proposing instead that innovators should make better efforts to capitalise on their first-mover advantages.

¹⁰ Expressing similar concerns, Brazil and Argentina made a proposal in 2004 for WIPO to launch a new development agenda. The text of their proposal is available here: http://www.wipo.int/documents/en/document/govbody/wo_gb_ga/pdf/wo_ga_31_11.pdf.

On the other hand, some developing country governments have sought to exploit strengthened IPRs strategically as a development tool intended to encourage investment and domestic innovation. They see this as having the potential to boost development on both the extensive dimension (overall size of the economy) as well as the intensive dimension (*i.e.* the value-added per employee).¹¹ For example, experts in some poor countries have seen the institution of trademark protection as a means to reassure investors in manufacturing industries that they can combat knock-offs. For wealthier countries, enhancement of IPRs may be seen as a means to draw in high technology that can boost worker productivity.

STRENGTHENING OF IPRs

While divergences remain between the levels of IPR protection in developed and some developing countries, many developing countries have moved in recent decades to reform previously weak national systems of IPR protection. In some cases, countries with poorly adapted systems dating from a former colonial era – or sometimes, in effect, non-existent systems – have moved to join the WTO and adhere to the TRIPS Agreement, to ratify international treaties administered by WIPO, and to engage in regional trade agreements that sometimes include IPR provisions going beyond the TRIPS Agreement. These developments are resulting in concrete changes on the ground.

WIPO Ratifications

WIPO administers a series of international IPR treaties developed over many years. Since 1990, the geographic coverage of these treaties was notably extended via increased numbers of ratifications (Chart 1). This occurred, in particular, in relation to the launching of economic reforms in the former socialist countries and in association with the coming into effect of the TRIPS Agreement. During the period since 1990, for example:

- The *Berne Convention for the Protection of Literary and Artistic Works* (ref. copyrights and neighbouring rights) experienced 83 new ratifications (as of April 2008, the total number was 163);
- The *Paris Convention for the Protection of Industrial Property* (ref. patents, trade marks, industrial designs, utility models, geographical indications) experienced 75 new ratifications (as of April 2008, the total number was 172);
- The *Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations* experienced 53 new ratifications (as of April 2008, the total number was 86).

Particularly for the Berne and Paris Conventions, this was a considerable burst of activity in a relatively short period, given that both treaties date originally from the 1880s. The effect of these ratifications was to extend specific protections for intellectual property as countries moved to comply with the various provisions. For example, the Paris and Berne Conventions include provisions on “national treatment”, meaning that within the terms specified in the conventions, the ratifying country must offer non-nationals the same protection as it grants to its own nationals.¹²

¹¹ E.g., Cambodia, China and Singapore have integrated IPRs in their national economic strategies and affirmed the importance of IPRs on their national intellectual property office web sites:
http://www.moc.gov.kh/laws_regulation/development_of_cambodia's_ipr.htm,
http://www.sipo.gov.cn/sipo_English/news/official/200801/t20080117_230796.htm,
<http://www.ipos.gov.sg/topNav/abo/Vision+Mission+and+Values.htm>.

¹² Other examples: i) With respect to works covered under the Berne Convention, protection is “automatic” in that it is not to be conditional upon compliance with any formality. ii) The Paris Convention provides for the “right of priority” by which the filing of the first regular application for a patents, utility model, mark or industrial design entitles the applicant to apply subsequently in other contracting states with such applications regarded as if they had been filed on the same date as the first (for up to 12 months for patents and utility models, 6 months for industrial designs and marks).

TRIPS and Regional or Bilateral Trade Agreements

Particular impetus to the strengthening of IPRs came from the advent of the TRIPS Agreement, which came into effect on 1 January 1995, covering the main types of intellectual property¹³ and establishing more effective – and geographically inclusive – international minimum standards of protection for IPRs than had existed previously. The agreement specifies WTO member obligations to enforce IPRs. Through the WTO's framework for trade policy review, dialogue and dispute settlement it also provides pathways for redress among WTO members in cases of non-compliance by governments. According to the TRIPS Agreement, WTO Members may implement in their law more extensive IPR protection than the minimum required under the agreement, provided that this does not contravene the agreement. In this spirit, regional and bilateral trade agreements involving OECD members and developing countries often include IPR references going beyond the TRIPS Agreement, as do some agreements among developing countries (e.g. Mercosur).

Fink and Reichenmiller (2005) reviewed 13 recent or pending US free trade agreement texts and found that all of them included IPR provisions going beyond those of the TRIPS Agreement in some manner (e.g. by requiring the extension of the patent term in cases where there are delays caused by regulatory approval processes). In a review of 15 regional accords, Lippoldt (2003) found that most included one or more provisions going beyond the strict requirements the TRIPS Agreement. Often these additional requirements concern conformity with, or accession to, other relevant international agreements. For example, some agreements require adherence to WIPO's so-called Internet Treaties (*i.e.* the Copyright Treaty and Performances and Phonograms Treaty) as is the case under the EU-Mexico or US-Jordan trade agreements. There are also examples of regional trade agreements that have special provisions concerning shortened transition periods, enforcement or co-operation, among other issues

Indicators of IPR strengthening

The impact of the expanded recognition of internationally established IPRs is evident in key indicators for IPR strength and application. Two sets of indicators are presented in this section. The first set of indicators consists of four indices of IPR strength developed by Park *et al.* covering patents, copyrights, trademarks and enforcement effectiveness.¹⁴ The patent, copyright and trademark indices are based on laws on the books, regardless of their application in practice. However, as noted by Douglass North (1997), there is sometimes a difference between formal and informal institutions, with the latter changing more gradually. And, a change in a formal institution may also be subject to implementation difficulties. Thus, an enforcement index is included in the set to take into account business perceptions of the application of the IPR laws in practice (based on business perceptions as reported to the Office of the US Trade Representative). The four Park *et al.* indicators are considered here with respect to the observations for the years 1990, 1995, 2000 and 2005. The geographic coverage varies by index and year, but it is quite broad. The Copyrights index has the broadest coverage, including all 30 current OECD members and 105 developing economies.

The second set of indicators employed here is drawn from the *Institutional Profiles* database at CEPII (Paris). These indicators provide scores for conditions across nine institutional sectors based on a survey

¹³ The IPRs covered by the TRIPS Agreement include: copyright and related rights, trademarks, geographical indications (of origin), industrial designs, patents, layout-designs (topographies) of integrated circuits, and protection of undisclosed information (trade secrets). A full text of the TRIPS agreement is available on the WTO web site: <http://www.wto.org>.

¹⁴ These indices were developed by Walter G. Park (American University, Washington, DC) *et al.* The relevant references are: Index of Patent Rights: Ginarte and Park (1997), Park and Wagh (2002); Index of Copyrights and Index of Trademark Rights: Reynolds (2003) and Park (2005); Enforcement Effectiveness Index: Park and Lippoldt (2005). See the Annex for an overview of the composition of the indices and further references.

of French government economic officials resident in countries around the world. As of the time of drafting, two waves have been conducted – in 2001 and 2006 – covering 51 countries. The indicators considered here concern formal arrangements for IPR protection, respect for IPRs in practice, the effectiveness of competition regulation arrangements and security of formal property rights.

Table 1 presents, for a sample of developing countries, the average score for each of the “Park *et al.*” indices for the period from 1990 to 2005. The scores indicate a substantial increase in IPR strength over this period, particularly with respect to the indices for laws on the books. Enforcement of the strengthened laws on the books, though improved, still lags somewhat behind on average. The memo item in the table presents for comparison the OECD country average scores for 2005, underscoring the lingering gap with the developed countries in all of the indices. This gap may partly reflect the fact that in some cases the developed countries have IPR protection going well beyond the international minimum standards; but, it also partly reflects continued instances of shortfalls in developing country attainment of certain standards. The shortfalls in turn may in part be due to transition periods or special and differential treatment with respect to developing countries (as is available for the least developed countries, LDCs, with respect to patent protection for pharmaceutical products). At the same time, there are also sometimes genuine non-compliance issues.¹⁵ Nevertheless, the importance of the changes in the four indices should not be minimised. The strengthening of laws on the books and improved enforcement are providing economic agents globally with a signal as to the future course of government policy – even if there are shortfalls.

Table 2 draws on the CEPII *Institutional Profiles* dataset for 2006 to present correlations among IPR indicators (concerning perceived respect for intellectual property in practice and the formal arrangements for protection of intellectual property) and other institutional and developmental indicators. The table covers a range of developed and developing countries, 51 in all, but no LDCs are included. The table points to a modest degree of correlation between the IPR indicators and the indicators for effective institutions with respect to competition and security of formal property rights.¹⁶ That is some tendency towards consistency in the development of these institutions in a given country.

While security of property rights may constitute a fundamental building block for the economy, the interaction of competition policy and IPR strengthening can be important in balancing interests and promoting innovation. This is because IPR strengthening confers increased market power on the rights holders (*e.g.* with respect to a given technology), whereas effective institutions for competition can facilitate development of alternatives or collaborative enhancements. Nevertheless, in a survey of the recent economic literature on the interaction between competition law and intellectual property rights, Ganslandt (2008) notes the prevailing view that these regulatory systems are consistent in terms of basic principles, but that it is difficult to balance IPR and competition law in practice.

Table 2 also presents the correlation between the CEPII IPR indicators and indicators of economic development, namely, membership in the OECD and per capita GDP. Surprisingly, the correlation for OECD is weak, perhaps in part due to the under-representation in the sample of European Union countries with strong IPR protection. On the other hand, the correlation with the GDP indicator is relatively high. While this does not imply causality and does not control for other factors, it does indicate the coincidence of stronger IPR indicators with higher levels of GDP.

¹⁵ E.g., these issues are sometimes discussed in the WTO TRIPS Council. More information is available here: http://www.wto.org/english/tratop_e/trips_e/intel6_e.htm.

¹⁶ Security of property rights refers to such aspects as effectiveness of legal measures to defend property rights between private agents, compensation in the event of de jure or de facto expropriation (by the Government) of real property or instruments of production, and arbitrary pressure from the government on private property (*e.g.* red tape).

Table 3 highlights the correlation between several indicators from the CEPII *Institutional Profiles* database (2001) and the Park *et al.* indices for enforcement and patent rights (2000). A relatively strong relationship is found between the CEPII indicator for respect for intellectual property and the Park *et al.* indices. Given the different sources for the two data sets, this provides some independent confirmation of the variation captured in the Park *et al.* indices. Interestingly, the CEPII indicator for “Security of Contracts Between Private Agents” is also fairly strongly correlated with the two Park *et al.* indices and strongly correlated with the CEPII “Respect” indicator. Thus, confidence in contractual relations may be associated with respect for intellectual property and with strength of IPR laws on the books and perceptions of enforcement. Also, the Park *et al.* Enforcement Effectiveness Index is correlated with the Patent Rights Index, indicating that countries with relatively strong laws on the books often have relatively strong enforcement.

Countries acceding to the WTO

As the multilateral trading system evolves over time, continued participation through membership in the WTO drives change. Countries take on new commitments and obligations that now go beyond the ‘traditional’ trade-related border issues. This is particularly true for newly acceded countries. Evenett and Primo Braga (2005) note the expanding demands that are being placed on countries acceding to the WTO since 1995, including in the service sector and with respect to rules that in some cases may not be obviously trade-related. Chart 2 highlights change in the strength of IPRs (in terms of laws on the books) in six countries newly acceded to the WTO, according to type of intellectual property (*i.e.* patent, copyright or trademark) and compared to the average score for a broad group of developing countries. As the chart shows, each of the countries moved to strengthen its legal framework to a level roughly comparable to – or above – the average for the broader sample of developing countries.

THE ASSOCIATION OF IPR CHANGE WITH CHANGE IN ECONOMIC INDICATORS

The changes in the institutions governing IPRs in developing countries matter because they constitute one influence on the course of economic development. Business decisions to invest and trade are complex and based on a variety of considerations, with higher-level considerations sometimes trumping lower level concerns.¹⁷ While an effective IPR regime may not be sufficient in-and-of itself to attract FDI or trade, an inadequate IPR regime can be in some cases a deal-breaker for a firm looking to invest or trade. As IPR standards improve in countries around the world, the competitive advantage that provision of basic IPR protection affords to a given host country shrinks. Some firms have come to require a basic level of protection. On the other hand, depending on the technology concerned, it may be that a strategy of trade secrecy can adequately protect a firm’s intellectual property in some cases, even in the face of some weakness in the local IPR system. In some cases, factors such as market scale (*i.e.* access to a large market) or strategic positioning prove to be dominant factors motivating investment or trade.¹⁸ Such factors, for example, may help to account for the large number of pharmaceutical FDI projects in China (which has had a mixed performance on IPR enforcement since its entry into the WTO in 2001).¹⁹ There

¹⁷ The choice of whether and where to invest depends on locational advantages of the home and foreign markets and the profitability of internalising production or selling or licensing the technology to another firm that is active in the market [Primo Braga and Fink (1998)]. The extent of protection for intellectual property rights can constitute an important locational advantage.

¹⁸ In a survey on investment issues affecting the world’s largest 1,000 firms, business leaders characterised the most critical risks to their corporations as they invest abroad [A.T. Kearney (2003)]. At the top of the list were government regulation, country financial risk, currency risk, and risk of political and social disturbances (each of which cited by 60% or more of respondents). Theft of intellectual property was cited by 17% of the respondents and ranked 12th on the list of concerns.

¹⁹ Among the top 10 locations for pharmaceutical FDI projects during January 2002 to February 2005, China ranked second with 44 projects. The US ranked first with 52 FDI projects in the sector. Other countries

is a growing empirical literature on the relationship of IPR strength to trade and FDI, technology transfer and other dimensions of the economy.²⁰ While the importance of IPRs as a determinant of key stocks and flows varies according to the sector and host country (*e.g.* in light of imitative capacity), the findings tend to point to a generally positive relationship, particularly with respect to patent rights and enforcement effectiveness.

Table 4 presents one example drawing on findings from a recent study by Park and Lippoldt (2008). Using regression analysis, they estimated the relationship of change in the Patent Rights Index to change in indicators for merchandise imports (Panel A) and the stocks of FDI (Panel B), while controlling for a variety of other factors (enumerated in the table notes). The analysis covered the period from 1990 to 2005, focusing on a sample of developing and OECD countries.²¹ With respect to trade, the strength of patent rights was found to be significantly associated with changes in total imports. A 1% increase in the strength of patent rights was found to be associated with a 1.3% increase in merchandise imports in developing countries, controlling for other factors. A weaker, but still significant, relationship was found for LDCs. (A significant positive relationship between the strength of patent rights and imports was also found for imports in a range of high-technology sectors.) The study also found that the patent rights as described by the index were associated positively with the stock of inward FDI in developing countries and LDCs. A 1% increase in the Patent Rights Index was associated with a 1.7% increase in the stock of FDI. Using similar analytical approaches, Park and Lippoldt (2005, 2008) have also found stronger IPRs associated positively with licensing and technology transfer to developing countries.

The regression analysis as specified in these studies does not demonstrate causality, but it does highlight statistically significant relationships between variables that appear to explain a portion of the variation. The extent of the influence of IPRs varies according to the type of intellectual property right and the effectiveness of IPR enforcement. Patent rights and enforcement effectiveness, in particular, tend to be associated positively with these flows. The results do not imply that stronger protection for patents or other IPRs will always increase trade, FDI, licensing and the associated transfer of technology. IPR protection, accounting for only a portion of the variation in the flows, is not a “silver bullet” development solution. Nevertheless, appropriate IPR standards do appear to contribute to an environment conducive to the growth of these flows.

Conclusion

Institutions matter for the economy and reform of institutions is driven by a variety of influences. With respect to IPRs, a portion of recent change appears to be associated with liberalisation catalysed at the multilateral or international level. The engagement of developing and transition countries in initiatives of international organisations such as the WTO and WIPO is being reflected in changes in the institutions governing IPRs on the ground in these countries. Developing countries, on average, are moving to strengthen their IPR regimes and in some cases are beginning to approach the high standards of the advanced economies. The strength of IPRs is correlated with the strength of certain other key institutional variables, and some developing countries appear to be taking a strategic approach to IPR reform as one

ranked as follows: India (30), Ireland (29), Spain (27), Canada (27), UK (23), Singapore (23), Brazil (22) and Germany (18). [“Pharma pulls in \$15bn”, 12 April 2005, found 15 September 2006 at: www.fdimagazine.com]

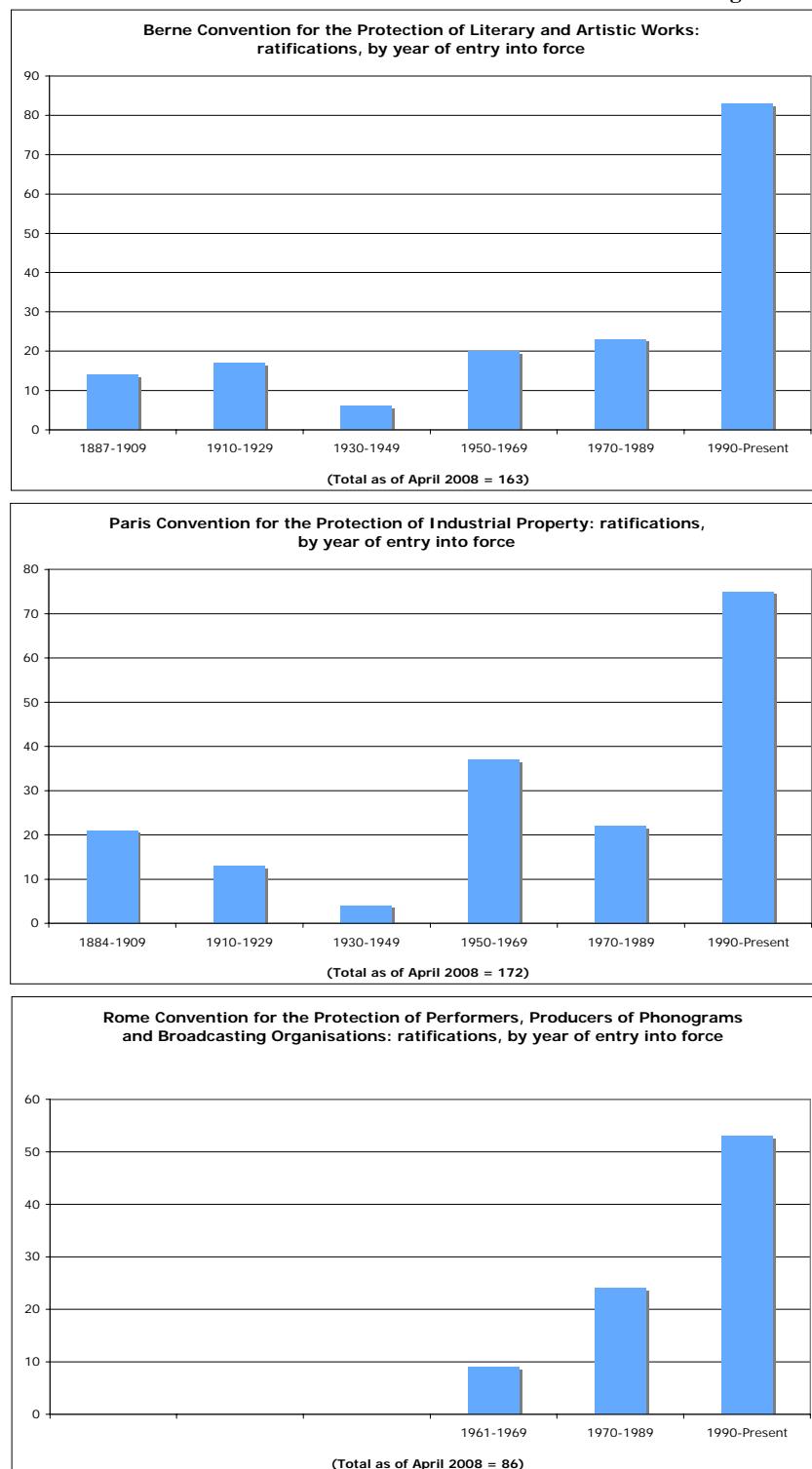
²⁰ E.g., see the partial surveys of this literature in Park and Lippoldt (2005, 2008), Branstetter *et al.* (2006), and Lippoldt (2008).

²¹ The sample included 25 developed countries (23 OECD countries, plus Israel and Malta), 78 developing and transition countries, and 27 Least Developed Countries (LDCs). The sample excluded developing countries that receive substantial amounts of FDI due to their status as tax havens or centres for “offshore holding companies” rather than as the ultimate destination or host for investment funds (*i.e.* economies such as Bermuda, the Bahamas and Netherlands Antilles were excluded from the sample).

part of their larger economic development strategies. Since the recent wave of IPR reform got underway in the 1990s, some empirical studies are pointing to a positive association of strengthened IPRs with certain other economic variables such as imports, FDI, technology transfer and domestic innovation, albeit with variation by sector and country.

The global economy has become increasingly integrated as technological advances, trade and investment liberalisation, reform in transition countries, institutional change and other factors have come together to break down barriers and increase international economic possibilities. The multilateral trading system has played a major role in promotion of economic integration, in part by influencing the evolution of institutions related to intellectual property rights in developing countries. As Lippoldt (2008, forthcoming) points out, with the increasing globalisation of markets and the establishment of international standards for IPR protection, competitive pressures are challenging growth-oriented developing countries to address any basic shortcomings in their national IPR regimes. Conformity with the minimum global IPR standards has become, in effect, a prerequisite for developing countries wishing to access and exploit the full range of global technologies and know-how.

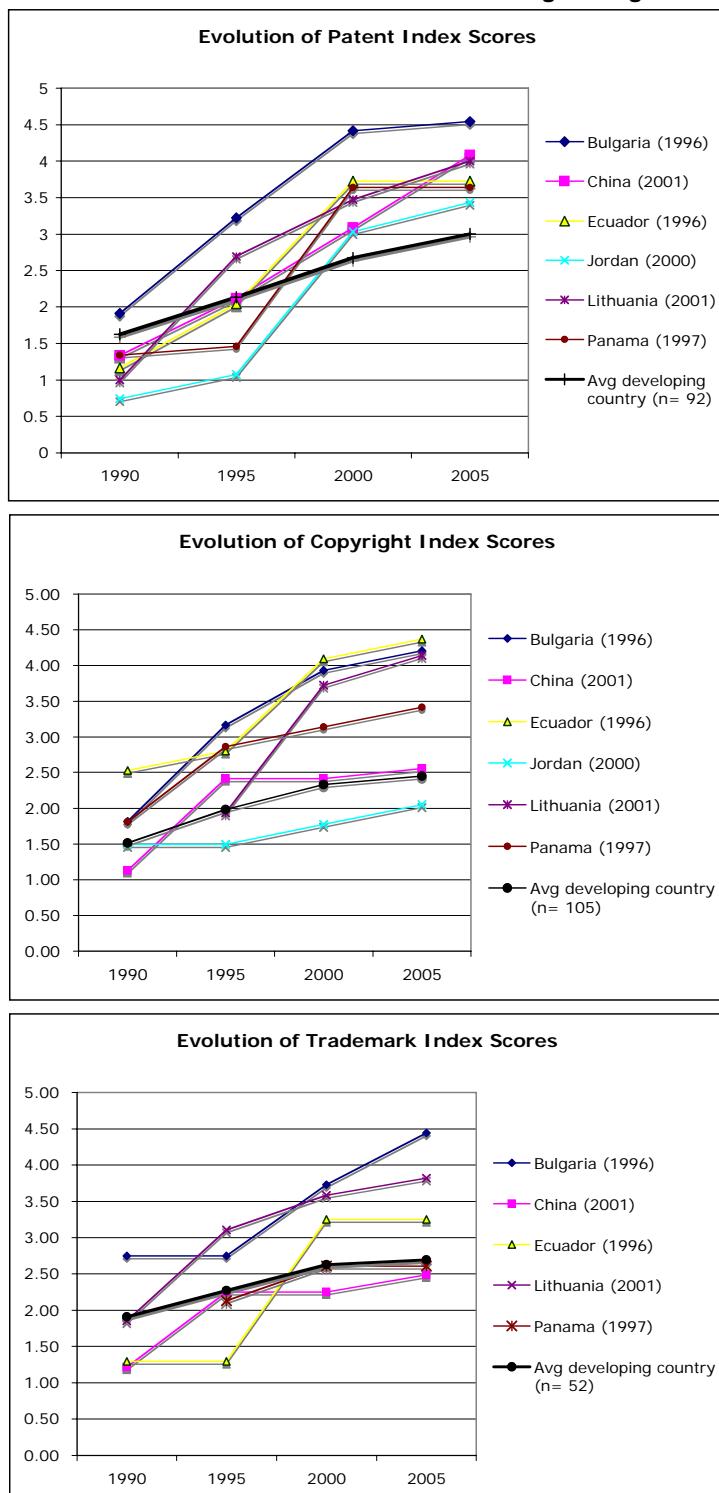
Chart 1. Selected WIPO Conventions Referenced in the WTO TRIPS Agreement



Note: The TRIPS Agreement also references the Treaty on Intellectual Property in Respect of Integrated Circuits adopted in Washington, 1989, but which has not entered into force.

Sources: WIPO, http://www.wipo.int/treaties/en/SearchForm.jsp?search_what=C and Lippoldt (2008, forthcoming).

Chart 2. WTO Accession and IPR Strengthening



Note: Numbers in parentheses indicate the year of WTO accession, except for the developing country average where it indicates the number of countries in the sample. Trademark data were not available for Jordan. Source: Based on data underlying Park and Lippoldt (2005).

Table 1. Evolution of Average IPR Index Scores for Developing Countries, 1990 – 2005

Year	Park et al. Indices			
	Patent Rights Index	Copyrights Index	Trademark Rights Index	Enforcement Effectiveness Index
1990	1.63	1.51	1.91	0.67
1995	2.13	1.98	2.27	0.82
2000	2.67	2.33	2.63	1.25
2005	3.00	2.45	2.69	1.68
<i>N</i> =	92	105	52	52
Memo item:				
Average for OECD countries in 2005	4.39	3.72	3.60	4.40
<i>N</i> =	30	30	29	25

Notes: *N* refers to the number of countries covered by each indicator. The Patent, Copyrights and Trademark indices are based on laws on the books, whereas the enforcement effectiveness index is based on business perceptions. The maximum range of scores is 0-to-5 for the indices. The Copyright, Trademark and Enforcement indices were rebased from their original range of 0-to-1. See Annex 4 of Park and Lippoldt (2008) for an overview of the composition of these indices, except for the Enforcement index see Appendix A of Park and Lippoldt (2005).

Sources: Park and Lippoldt (2008) and Park and Lippoldt (2005) including underlying data and the present author's supplemental calculations.

Table 2. Correlation of Institutional Indicators and Economic Performance, 2006

Strength of protection of Intellectual Property:	Effectiveness of competition regulation arrangements (CEPII - B702)	Security of formal property rights (CEPII - A601)	OECD Membership	Per Capita GDP (PPP exchange rates, 2006)
a) Respect in practice (CEPII - B603)	0.63	0.67	0.53	0.75
b) Formal arrangements (CEPII - B604)	0.60	0.60	0.50	0.68

Note: Two other sets of correlations of CEPII variables were not significant: 1) strength of intellectual property protection versus perceived adaptive and innovative capacity of society, 2) strength of intellectual property protection versus security of contracts between private agents.

Sources: CEPII, *Institutional Profiles Database*, 2007, except per capita GDP from World Bank, *World Development Indicators*, 2007, except GDP data for Chinese Taipei, Israel and Saudi Arabia from CIA, *World Factbook*, March 2008; author's calculations.

Table 3. Correlation of Selected Institutional Indicators: CEPPII Institutional Profiles Database (2001) versus the “Park et al.” Enforcement and Patent Indices (2000)

	CEPII - Respect for Intellectual Property	Arrangements for protection of Intellectual Property	CEPII - Security of contracts between private agents	Park - Enforcement Effectiveness Index
CEPII - Arrangements for protection of IPR	0.741442	1		
CEPII - Security of contracts between private agents	0.750967	0.669304	1	
Park - Enforcement Effectiveness Index	0.636504	0.470192	0.603324	1
Park - Patent Rights Index	0.713383	0.558154	0.604138	0.641282

Note: The CEPII data series referenced in the column titles above correspond, left to right, to the CEPII database indicators B603, B604 and A603. Matched sample of 38 countries from each survey covering: Argentina, Brazil, Bulgaria, Cameroon, Chile, China, Colombia, Egypt, France, Germany, Ghana, Greece, Hong Kong, Hungary, India, Indonesia, Ireland, Israel, Japan, Malaysia, Mexico, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russia, Singapore, South Africa, South Korea, Thailand, Tunisia, Turkey, Ukraine, Venezuela, Zimbabwe.

Sources: CEPII (2007) and data underlying Park and Lippoldt (2005).

Table 4. The relationship between merchandise imports, FDI inflows and patent protection, 1990 - 2005

Sector	Destination	Coefficient estimate	N	Pseudo-R ² (%)
Panel A. Merchandise import flows				
Change in import flows associated with a 1% change in the Patent Rights Index	Developing countries	1.34*** (0.16)	164	36.5
	LDCs	0.54* (0.31)	31	74.0
Panel B. Inward FDI stock				
Change in stock of inward FDI associated with a 1% change in the Patent Rights Index	Developing countries	1.65*** (0.19)	163	35.1
	LDCs	1.66*** (0.76)	31	57.3

Notes: The dependent variables for these regressions are, respectively, import flows and inward stock of FDI in real 2000 US dollars. All variables are in natural logarithmic units (except an indicator for governance). The coefficient estimates represent the percentage change in imports or FDI per 1% change in the recipient country's index of patent rights. N denotes number of observations and Pseudo-R² an estimate of the fraction of the variation in the data explained by the model. The estimates were obtained via a Feasible GLS regression which controlled for other determinants of trade including: real GDP per capita and indicators for freedom to trade internationally, Doing Business rank (business environment), perceptions of IPR enforcement, legal effectiveness, physical property rights and governance. ***, ** and * denote significance levels at the 1, 5 and 10% levels, respectively. To conserve space, coefficient estimates of the control variables are not reported. *Source:* Park and Lippoldt (2008).

Appendix – Data and Methods

A. Park et al. Intellectual Property Rights Indices - Components

This section summarises the components of each IPR index employed in the present study. In calculating each index, the scores for the main elements are combined in an unweighted fashion. For measurement and scoring details see Park and Lippoldt (2008, Appendix).

I. Patent Rights Index: Ginarte and Park (1997), Park and Wagh (2002)

- 1) Membership in international treaties including: i) Paris Convention and Revisions, ii) Patent Cooperation Treaty, iii) Protection of New Varieties (UPOV), iv) Budapest Treaty, v) TRIPS Agreement.
- 2) Product coverage, in terms of patentability: i) pharmaceuticals, ii) chemicals, iii) food, iv) plant and animal varieties, v) surgical products, vi) microorganisms, vii) utility models, viii) software.
- 3) Restrictions on patent rights (positive, if these do not exist): i) “working” requirements, ii) compulsory licensing, iii) revocation of patents
- 4) Enforcement: i) preliminary injunctions, ii) contributory infringement, iii) burden-of-proof reversal
- 5) Duration of protection: proportion of “full duration” (i.e., 20 years from the date of application or 17 years from the date of grant for grant-based patent systems).

II. Copyrights Index: Reynolds (2003) and Park (2005)

- 1) Coverage: i) general (literary and artistic works), ii) performances, iii) sound recordings, iv) films, v) broadcasts, vi) droite de suite (shares in resale), vii) computer programmes. Scoring: i) – v) based on availability measured as a proportion of 70 year duration, vi) share as percentage of max (top censored at 5%), viii) based on availability.
- 2) Usage - extent of private use: i) full use or no mention of private use, ii) private study or fair dealing, iii) use but with tax on devices or media, or iv) no private use allowed.
- 3) Enforcement, availability of: i) criminal sanctions, ii) preliminary injunctions, iii) seizure and destruction, iv) anti-circumvention provision.
- 4) International treaties, membership: i) Berne Convention 1886, ii) Universal Copyright Convention 1952, iii) Rome Convention 1961, iv) Geneva Convention 1971, v) Universal Copyright Convention 1971, vi) Brussels Convention 1974.

III. Trademark Rights Index: Reynolds (2003) and Park (2005)

- 1) Coverage: i) service marks, ii) certification marks, iii) collective marks, iv) colours, v) shapes (3-dimensional, packaging, etc.), vi) well-known marks.
- 2) Procedures, availability: i) prohibition of marks in bona fide use, ii) licensing restrictions, iii) use or lose provisions in law, iv) international exhibition protection, v) criminal penalties, vi) local lawyer requirements, vii) marks can become generic, viii) transferability of mark without business, ix) priority goes to first to use a mark.
- 3) International treaties, membership: i) Paris Convention 1883, ii) Madrid Agreement 1891, iii) Nice Agreement 1957, iv) Lisbon Agreement 1958, v) Vienna Agreement 1973, vi) Trademark Law Treaty 1994.

IV. Enforcement Effectiveness: Park and Lippoldt (2005)

This index is a qualitative measure of the effectiveness of IPR enforcement in practice. It is based on reports filed with the US Trade Representative documenting experience and perspectives in relation to enforcement in countries outside the U.S. The reports describe complaints (with all the limitations and biases such may contain), if any, about enforcement procedures and about the failure of the proper authorities to carry out the laws on the books. The failure to enforce may be due to some inability on the part of the authorities to carry out those laws or due to a conscious policy choice. Complaints

about the lack of substantive laws are not incorporated here. The Enforcement effectiveness index is scored as follows: **0** if enforcement measures are not available or inadequate to deter abuse; **½** if enforcement measures are available but not effectively carried out (e.g. due to lag in policy implementation or resource barriers); **1** otherwise.

V. CEPPI Institutional Profiles – IPR and associated indicators

The alternative indicators for respect of IPR and adherence to appropriate IPR arrangements were drawn directly from the *Institutional Profiles* database, CEPPI (2007), available at: <http://www.cepii.fr/ProfilsInstitutionnelsDatabase.htm> .

B. Data Sources: Import and FDI Assessment (Table 4)

- Merchandise trade: WTO Statistics Database, Time-Series on Merchandise and Commercial Services Trade, http://www.wto.org/english/rese/statistics_e/statistics_e.htm .
- Inward FDI stock: United Nations Conference on Trade and Development (UNCTAD), Foreign Direct Investment Database, <http://stats.unctad.org/fdi> .
- Control variables: IPR survey and Physical property rights, World Economic Forum, *Global Competitiveness Reports*; Legal effectiveness and Freedom to trade internationally, Economic Freedom Network, 2006 dataset; Real GDP per capita, World Bank, *World Development Indicators*, 2007; Doing Business and Governance, World Bank (on-line).

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