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Innovation and Intellectual Property

Good Practices and Policy Recommendations



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United Nations Economic Commission for Europe

INNOVATION AND INTELLECTUAL PROPERTY

**A COMPENDIUM OF POLICY RECOMMENDATIONS
AND GOOD PRACTICES 2008-2012**



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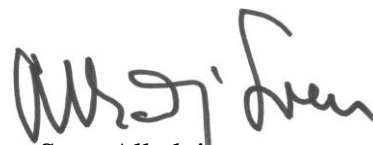
FOREWORD

Innovation is a key driver of sustainable development and economic growth, and of meeting the Millennium Development Goals, as re-affirmed by the 2013 Annual Ministerial Review of the United Nations Economic and Social Council. The global financial crisis of 2008-2009, the effects of which are still being felt in many countries, has only reinforced the need for innovation as a way of recovering lost ground and of making economies more resilient.

The region covered by the United Nations Economic Commission for Europe (UNECE) includes many of the most technologically advanced and innovative economies, but also most of the countries with economies in transition, and even some that qualify as developing economies. As such, our region is a very fertile ground for assessing innovation policies, learning from experience, and sharing the lessons thus learned.

UNECE has been doing this by organizing a series of international policy dialogues on the key aspects of innovation policy; distilling international good practices; developing policy recommendations; providing policy advice to requesting governments; and building capacity to implement policy reforms.

This Compendium is part of a series collecting the policy recommendations and good practices developed under the auspices of the UNECE Committee on Economic Cooperation and Integration (CECI). They are developed through an extensive multi-stakeholder policy dialogue within our international expert networks. The Compendium is intended to disseminate this work to a broader audience. The present volume discusses selected aspects of the role of intellectual property in the innovation process.



Sven Alkalaj
Executive Secretary

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ABBREVIATIONS

CREST	Scientific and Technical Research Committee of the European Commission
CECI	Committee on Economic Cooperation and Integration
EU	European Union
FDI	Foreign direct investment
IP	Intellectual property
IPRs	Intellectual property rights
OECD	Organisation for Economic Co-operation and Development
R&D	Research and development
SME	Small and medium-sized enterprise
TOS-IP	Team of Specialists on Intellectual Property
UNECE	United Nations Economic Commission for Europe

EXECUTIVE SUMMARY

Well-defined, affordable and enforceable intellectual property rights (IPRs) provide incentives to invest in innovation, support the emergence of markets for intellectual assets, and encourage the disclosure of inventions and thereby the diffusion of innovation. This third part of the book discusses three issues at the interface of innovation and intellectual property (IP): the role of IPRs in facilitating open innovation, the interplay of intellectual property and competition policy, and how to raise awareness of the benefits and limitations of intellectual property for innovation.

We are increasingly witnessing the opening up of innovation through cross-border cooperation in research and development (R&D), cooperation between science and industry, and within leading multinational companies which set up R&D centres or source technologies in different parts of the world. These activities require the secure and efficient transfer of knowledge across legal entities and borders. The quality of national IP law and practice therefore is a factor determining the extent to which a country will be able to participate in international innovation networks and the attendant knowledge transfer.

Competition is a “stick” which prods companies to innovate. The return on innovation which IPRs promise is a “carrot” which rewards innovators. As such, both competition law and IP law share the same goal of encouraging innovation. However, certain uses of IPRs may create undue restrictions on competition particularly from innovative rather than imitating companies. At the same time, if competition is too fierce, companies will be unable to earn a sufficient return on the substantial investments which innovation often requires, because imitators poach customers by selling at lower prices. This may discourage companies from innovating. Appropriately balancing competition and IP law and policy is therefore a constant policy challenge.

Significant problems of both application and enforcement of IPRs exist in many countries. Copyright piracy and trademark counterfeiting are a growing problem, in part because there are plenty of enthusiastic customers of infringing products. In academic settings, researchers frequently are unenthusiastic about IPRs protection and commercialization, thereby compromising knowledge transfer. And many small and medium-sized entrepreneurs do not use IPRs, thereby foregoing opportunities for growing their businesses. In all these cases, initiatives that raise awareness about the economic and potential health and safety damages of infringements and about the benefits of IPRs in terms of stimulating innovation, creating jobs and stimulating economic growth can be part of the solution.

THE MANAGEMENT OF INTELLECTUAL PROPERTY IN OPEN INNOVATION¹

Increasingly, innovation is an open process, in which companies source knowledge and technology from wherever they find it, including from abroad. This openness of the innovation process poses new challenges not only for the management of intellectual property at the enterprise level, but also for intellectual property policy.

The present chapter draws on the main conclusions of the conference “[Intellectual Property Rights Enforcement and the Role of Intellectual Property in International Research and Development and Knowledge Transfer](#)”, Geneva, 8 and 9 July 2010.² The Conference was the Substantive Segment of the fourth session of the UNECE Team of Specialists on Intellectual Property.

The chapter is structured as follows. The second section discusses international trends in cross-border open innovation and the drivers behind them. Section III summarizes the main challenges which cross-border open innovation poses for intellectual property management and policy. Section IV presents an overview of international good practices and policy recommendations on how to overcome these challenges. It addresses good practices and policy recommendations for innovative companies, research organizations, governments, as well as the scope for international cooperation in this field.

1.1 Cross-border open innovation

Innovation is the key force driving economic development and prosperity. Innovation in turn is based on the creation of new, economically relevant knowledge. With the rise of digital information and communication technologies and the world-wide web, the cost of generating and transmitting knowledge has fallen significantly. This is true particularly of the cost of communicating across borders. And this trend is projected to continue, if not accelerate, over the next decade. As a result, the rate at which knowledge and information is generated has accelerated significantly and is expected to continue doing so.³

After the globalization of supply chains and production networks through foreign direct investment (FDI) and the off-shoring of production processes and foreign sourcing of inputs, we

¹ This chapter is based on UN document ECE/CECI/2010/7, “Synopsis of good practices and policy recommendations on the management of intellectual property in open innovation”.

² Additional background materials are available at:

http://www.unecce.org/ceci/ppt_presentations/2010/ip/presentationip10.html.

³ According to a recent study, the amount of digital information alone has grown by 62 percent from 2008 to 2009. It grew by a factor of 5 between 2006 and 2009, and is projected to grow by a factor of 44 until 2020, as the cost of managing information declines to a fraction of a dollar per gigabyte (IDC (2010), The Digital Universe Decade – Are You Ready? <http://www.emc.com/collateral/demos/microsites/idc-digital-universe/iview.htm>).

are now increasingly witnessing the opening up and the internationalization of research, development and innovation through cross-border cooperation in academic and applied research and development (R&D), cooperation between science and industry, and within leading multinational companies which set up R&D centres or source R&D and technologies in different parts of the world.

While the overall share of enterprises engaging in cross-border open innovation remains relatively small,⁴ there are a number of intellectual-property-related indicators that document the growing trend and the current significance of cross-border open innovation.

One indicator is the fact that in 2009, a quarter of all patent applications processed through the Patent Cooperation Treaty were submitted jointly by applicants from different countries.⁵ Also, the share of foreign applications in all applications was 44 percent in 2008, up from some 30 percent in 1990.

Another indicator is the so-called technology balance of payments of a country which measures the extent to which the country participates in international transfers of disembodied market-ready technologies. It mainly measures sales/purchases of IPRs, licensing and royalty payments, and cross-border investments in industrial R&D.

In addition to these transfers of disembodied technologies, technologies can also diffuse from one country to another in the form of technologies embedded in imported machinery and equipment, or in the form of knowledge workers moving internationally (including expatriates sent by parent companies to work in foreign subsidiaries).

Payments and receipts of income from disembodied international technology transfers have risen steadily in the member countries of the Organisation for Economic Co-operation and Development (OECD) as a whole and the European Union (EU).⁶ It is important to emphasize in this context that what matters is not necessarily whether the technology balance of payments is positive or negative.⁷ A negative balance can be a positive result if it reflects large imports of technology by a country with a strong domestic capacity to absorb and adapt foreign technologies in the process of catching up to the global technological frontier. This is the case for instance in some of the new member States of the European Union. By contrast, a positive technology balance of payments could be a negative result if it reflected a lack of openness to foreign technologies and a lack of absorptive and adaptive capacities.

⁴ According to a recent enterprise survey carried out by Eurostat, the average share of enterprises engaging in international sourcing of R&D was 2.1 percent in the period 2001-2006 (Eurostat Statistics in Focus 4/2009, International Sourcing in Europe).

⁵ This number has increased from 9 percent of all applications since 1990 (World Intellectual Property Organization (2010), World Intellectual Property Indicators http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/941e_2010.pdf).

⁶ OECD Science and Technology Scoreboard 2009 (<http://www.oecd-ilibrary.org/docserver/download/fulltext/9209031ec049.pdf?expires=1284566704&id=0000&accname=guest&checksum=AADF262C7C0CE4FB488FC2FA1EDA36E7>).

⁷ Typically, balances are small in leading countries, although both receipts and payments separately can be large. The average balance in the EU-15 and the OECD in 2006 was only 0.15 and 0.2 percent of GDP, respectively.

The trend towards increased internationalization of R&D and innovation is being driven largely by leading innovative companies that have come to the realization that “not all the smart people in the world work for us”. These companies have therefore decided to open up their innovation processes to allow for the in-flow and out-flow of inventions and technologies at all stages of the process.

Before, the traditional approach to innovation was to rely mainly on in-house proprietary R&D and to be wary of anything that was “not invented here”. The open-innovation approach reverses this and actively seeks to tap into knowledge and technologies that were “proudly invented elsewhere”. This is achieved by cooperating in research and development with outside partners, such as research organizations or other innovative companies, and by buying or licensing in existing technologies.

At the same time, “open innovation” means that the company is also always open to the possibility of selling or licensing out technologies that were invented in-house, but which the company does not want to commercialize, be it for lack of resources, or because the possible applications do not fit the company’s core business model.

Because the main rationale for the open innovation approach is to be able to tap into as big a pool of outside talent and knowledge as possible, the approach is almost by definition international. Open innovation companies do not want to limit themselves to outsourcing and in-sourcing knowledge and technology only to and from partners within their home countries.

Just as not all the smart people work for any given innovative company, so not all the smart people live in a given country. And so just as leading innovative companies can benefit from cross-border open innovation by cooperating with some of the smart people not working for them, so countries can benefit from cross-border open innovation by enabling their domestic researchers, inventors and innovative companies to cooperate with their foreign peers.

National innovation systems typically lack the scale to be efficient and competitive at a global level in all, or even any technology fields. Even the European Union, which is the leading global producer of knowledge as measured by scientific articles, found that the national innovation systems of its members are lagging behind that of the United States in terms of knowledge transfer from academic institutions to industry and, as a result, in terms of commercialization success.⁸ The main reason is that the national innovation systems are too small and lack critical mass.

In order to overcome this lack of critical mass at the national level, the European Union has made cross-border open innovation, i.e. creating the so-called Fifth Freedom (of movement of researchers and knowledge) and the integrated European Research Area, one of its priorities in order to close the innovation gap with the United States (US). Non-EU member States within the UNECE region face similar if not greater challenges from the lack of critical mass of their national innovation systems if taken in isolation.

⁸ Surveys among US and EU universities indicate that US universities are significantly more active than their European counterparts in commercializing research results, as measured by invention disclosures, priority patent applications, options and licenses, and start-up companies.

Cross-border open innovation increases competition and hence the pressure for excellence in research, development and innovation. It holds the potential to accelerate innovative solutions to the problems facing modern economies and societies. It can make national innovation systems more efficient and can lead to increases in the return to investment in research and development. This in turn strengthens the incentives for such investments and leads to a higher R&D intensity and hence a higher knowledge intensity in the economy. In turn, this improves international competitiveness.

Because open innovation involves different partners, and frequently partners from different countries, it poses its own particular challenges in the management of intellectual property. The present note summarizes good practices and policy recommendations on how to overcome these challenges.

1.2 Challenges for IPR management and policy in cross-border open innovation

The role of well-defined, affordable and enforceable IPRs in an economy is to provide incentives to invest in innovation, support the emergence of markets for intellectual assets, and encourage the disclosure and thereby the dissemination of inventions and the diffusion of innovation.

It is important to emphasize that “open innovation” generally does not mean that this traditional role of IPRs becomes less important or irrelevant, i.e. that innovations, or the inventions underlying them, will be available to anyone for free. This may be the case, as for instance in open-source software development. But in most other fields, where R&D and the commercialization of research results require significant capital outlays, a sound management of IPRs, including and particularly in a cross-border setting, will be critical for open innovation to be successful.

The specific challenges which open innovation poses for IPR policy and management arise from the fact that open innovation involves either the generation of new intellectual property in cooperation between different partners, or the transfer of IPRs or of rights of use between different entities. Therefore, while in the closed innovation model the main purpose of IPR management is to obtain legal protection of in-house research results in order to be able to exclude competitors, IPR management in open innovation has to be able to balance the needs and interests of several independent parties.

Lack of awareness of the importance of IPRs and lack of competence in managing IPRs has been identified as a barrier to successful innovation and technology transfer in many countries with economies in transition. This includes capability problems of potentially innovative companies with preparing patent applications, among others. Existing advisory services offered to small and medium-sized enterprises are often inadequate as most of these services focus on patents and tend to cover only the pre-application stage. But there often remains a large gap in advice on how to use intellectual property more broadly in business strategies, including the use of non-patentable intangible assets.

Moreover, to the extent that open innovation is carried out across borders, additional challenges arise from the fact that IPR laws and rules are national. This means that the parties engaging in cross-border open innovation need to be aware of differences in national intellectual property

laws and rules, and need to find ways to achieve the above balance of interests while ensuring compliance with all relevant national laws and rules.

Acquiring the necessary expertise and negotiating IPR agreements across jurisdictions with significantly different rules can impose high costs on the parties involved. These costs may be an obstacle particularly for small and medium-sized innovative enterprises and academic institutions to participate in open innovation.

Reaching agreement on IPR management can be particularly challenging in collaborations between academic research organizations and industry because companies and academic institutions often differ in their awareness about the need for IPR protection, and in the priority they assign to protecting rather than immediately publishing research results.

Weaknesses in the legal and regulatory framework for IPR protection can reduce the incentives of companies to fund R&D, both in-house and in cooperation with research organizations at home and abroad. In some countries, such weaknesses are among the factors that lead to comparatively low contributions of the private sector to economy-wide R&D spending.

For governments, the international nature of open innovation implies that their national intellectual property systems will be measured against those of other countries. Robust national intellectual property laws and the ability to enforce them are factors influencing the decisions by leading global technology companies on the location of their research and development activities and their choice of partners for open innovation.⁹ The quality of national intellectual property law and practice therefore is a factor determining the extent to which a country will be able to participate in international innovation networks and the attendant knowledge transfer.

One of the main features of open innovation is the sharing of intellectual property with research partners. Since most innovation is incremental rather than truly revolutionary, it will typically build on existing intellectual property, particularly patents, of one or all partners. Cross-border open innovation therefore can be hampered if national intellectual property regimes do not adequately provide for the effective and affordable enforcement of foreign-owned patents.

One of the possible benefits of open innovation across borders is for an innovative multinational company to harness the local knowledge of foreign researchers or entrepreneurs to develop products specifically adapted to local conditions. The resulting product would then typically be marketed by the multinational company in the local market. This may require combining the intellectual property which protects the underlying technology, such as patents, with complementary intellectual property rights of the multinational firm, such as a trademark. The need to provide for non-discriminatory, effective and affordable enforcement therefore extends beyond patents to other forms of intellectual property rights.

⁹ For instance, a recent survey of U.S.-based electronics manufacturers found that concerns about weaknesses in intellectual property protection was the second most important obstacle to the off-shoring of new product development activities (J. Dedrick et al. (2009), *Offshore New Product Development: Survey Results*. University of California Irvine).

At the same time, empirical evidence suggests that excessively broad IPR protection can be detrimental for foreign direct investment, knowledge transfer and hence innovation. Patent thickets (i.e. collections of patents in a given technological field obtained by a company with the intention of blocking competitors' R&D) and patent trolls (i.e. firms which buy up large portfolios of low-value, non-practiced patents and then use them to threaten truly innovative companies with law suits) are examples of phenomena that can reduce the level of innovative activity and knowledge diffusion. This danger is particularly acute where pro-competition policies are inadequate.

1.3 Good practices and policy recommendations

The following section offers good practices and policy recommendations for innovative companies, research organizations, and governments, and discusses the scope for multilateral cooperation in facilitating IPR management in cross-border open innovation.

Innovative companies and research organizations

The experience of leading innovative companies that have successfully embarked on open innovation shows that it is important to create an institutionalized policy of regular intellectual property audits in order to make sure that the company is aware about all the knowledge available inside, and knows about third-party intellectual property that might constrain the company's R&D and operations.

Along the same lines, successful open innovation requires developing an intellectual property management strategy which identifies opportunities to generate optimal value from existing knowledge by deciding which pieces to commercialize in-house, which pieces to make available for third-party commercialization, in which fields to invest in in-house R&D and where to license in or buy technology from outside, as well as how best to protect different types of knowledge, including through an international intellectual property protection strategy.

It should be emphasized in this context that not all innovation is technology-driven. A significant part is in improved business models or finding new applications for existing technologies. Hence, both auditing and intellectual property strategy need to include non-patent modes of IPR protection.

Leading open innovation companies also have clear policies on how to handle the intellectual property of potential and actual external partners. Good practice includes ascertaining that potential partners have obtained adequate protection of their own intellectual property so that the company can secure legal rights to the use of that intellectual property by negotiating a license with the partner.

Where the technology of the potential partner is still at a stage of development when it is too early to seek legal intellectual property protection, it is considered good practice to sign confidentiality and non-disclosure agreements before entering into negotiations about cooperation, and to educate the potential partner about the risks of disclosing confidential information, which might compromise the ability to obtain IPR protection at a later stage.

Research organizations and innovative small and medium-sized companies looking to partner with leading global technology companies in R&D need to be aware not only of their domestic IPR frameworks, but also of international IPR protection strategies and how to properly manage both the intellectual property they contribute to such cooperation and the intellectual property that results from it;

Research organizations seeking to partner with industry need to develop a policy for effective intellectual property management, covering goals, rules and procedures, incentives for university staff, and awareness raising and training measures. The policy needs to be in line with the overall mission and long-term strategy of the institution, including education and basic research. The policy should also be communicated clearly both internally and externally.

The intellectual property management policy should include clear rules for addressing issues such as:

- Researchers and staff regarding the disclosure of research results to the university's knowledge transfer professionals for potential intellectual property protection and commercial exploitation;
- The ownership of research results;
- Keeping proper records of research activities, so that the contributions of different participants can be documented;
- The management of potential conflicts of interest; and
- Engagements with third parties.

Relatedly, research organizations should set up knowledge transfer policies focusing on the active transfer and exploitation of intellectual property and including guidelines for exploitation strategies and policies such as licensing and start-ups, access to professional knowledge transfer services, and appropriate sharing of financial risks and returns between the organization, its departments, its researchers and any outside partners. Like the intellectual property policy, the knowledge transfer policy should be in line with the long-term strategy and mission of the institution, and it should aim at maximizing benefits to society and the economy at large, including, where appropriate, the decision to put research results into the public domain.

In this context, it is advisable to develop a policy on publication and dissemination of research results, which manages the trade-off between broadly disseminating research results and accepting a delay in publication while options for IPR protection are being considered.

In order to make the intellectual property and knowledge transfer policies operational, it is good practice to provide appropriate incentives to all staff concerned. Such incentives may include financial benefits, but also career prospects, i.e. including success in generating and exploiting intellectual property among the criteria for promotion or tenure.

To facilitate commercial exploitation, it may be advisable for the institution to create portfolios of related patents in particular technology fields, or even to create intellectual property pools involving intellectual property generated by other public research organizations. This may reduce

the costs for potential commercial partners of negotiating access to all intellectual property necessary for bringing a particular innovation to market.

The intellectual property and knowledge transfer policies should be broad enough to allow for all possible commercialization mechanisms, including licensing of intellectual property and the creation of spin-off companies, and for cooperation with all relevant potential partners, including existing small, medium-sized and large companies, other research organizations, financial investors, or public innovation support agencies.

Guidelines on licensing should be developed which spell out criteria for which kinds of licenses to grant (exclusive versus non-exclusive, global versus territorial, unrestricted versus restricted to certain applications, etc.).

Research organizations should regularly monitor and publish the results of their IPR protection and knowledge transfer activities in order to make their technological expertise, research capabilities and available intellectual property more visible to potential commercial partners and thereby to promote commercialization.

Additional rules should be established for the management of intellectual property in collaborative and contract research agreements, including across borders, i.e. for cases where industry partners provide funding and may participate actively in the research (rather than just licensing the results).

IPR experts should be involved in negotiating such agreements from the beginning in order to make sure that both the existing intellectual property (background) and the intellectual property to be generated during the project (foreground) are managed and used properly.

In collaborative R&D agreements between academic institutions and businesses, a good starting point is the principle that the party that has generated a particular research result should own the associated intellectual property. However, all partners should be granted access and user rights on terms that appropriately reflect the parties' respective contributions to the project and their needs for commercializing their own intellectual property. The IPR protection strategy, including whether or not to patent a particular invention, should be agreed among the partners. The division of responsibilities of the parties for protecting and enforcing resulting intellectual property rights should be established at the outset in the cooperation agreement;

In both licensing deals and collaborative research agreements, it is advisable to ensure that university researchers retain access to research results for further research in the future, and that the interests of university researchers in publishing their findings in academic publications are adequately balanced with the need for keeping results secret until patent applications have been filed.

Good practices and policy recommendations for governments

National innovation and intellectual property strategies need to be based on a solid evaluation of the economic situation and development priorities of the country in question. In order to be effective, innovation and intellectual property strategies also need to be designed and implemented in tandem with strategies to improve the business environment more generally.

Access to existing technologies, including from abroad, is a key pre-condition for innovation, since most innovation comes out of incremental changes to existing technologies, including their adaptation to the specificities of different local, regional and national markets. Success in innovation also depends on the ease with which the economy takes up new technologies and on the development of markets for new technology-based products and markets.

This means that it is important for governments to invest in strengthening national capacities for absorbing foreign technology in order to attract FDI and other forms of knowledge transfer and to benefit from the associated knowledge diffusion, and to put in place policies that foster the uptake of new technologies and the emergence of markets for innovative products and services.

By the same token, participation in cross-border open innovation is facilitated by general policies favouring economic openness and integration, including openness to foreign trade and foreign direct investment, and the international mobility of knowledge workers.

To maximize the benefits of participating in cross-border innovation, governments should aim to create or maintain a balanced intellectual property regime, which provides adequate incentives for research and development, while at the same time assuring that knowledge can diffuse and existing knowledge can be used as the basis for new research and development. The right balance may depend on the level of development and the structural characteristics of the economy in question.

Governments should ensure that appropriate pro-competition regulations and policies are in place to complement the IPR system and to ensure that intellectual property rights will not be used to unduly block legitimate competition.

One way for governments to stimulate cross-border cooperation in R&D and commercialization while also promoting appropriate IPR management policies is through public research funding programmes. Such programmes can be designed so as to require or reward beneficiaries engaging in cross-border cooperation. They can also be designed to require beneficiaries to employ good practice for the use of intellectual property (background) and the exploitation of intellectual property (foreground). And they can be designed to provide financial support for intellectual property management and IPR protection.

Such support can be complemented with programmes which reduce patenting costs, particularly for innovative small and medium-sized enterprises. Special financial support for international IPR protection may also be warranted.¹⁰

¹⁰ The costs of a patent application to the European Patent Office covering 12 member States and Switzerland are over 20 times higher than the costs for a United States patent application, and 13 times higher than the costs for a Japanese patent application. The costs of maintaining a granted patent in the 27 EU-member States are over 60 times

Experience from many countries in the UNECE region suggest that there is a strong need for policies to strengthen the awareness of all actors (researchers, management of public research organizations, small and medium-sized enterprises, and policymakers) of intellectual property management issues and improve their understanding of existing laws and regulations and the special challenges of IPR management in international collaborations.

Voluntary guidelines on how to properly manage IPRs in open innovation can be useful to raise awareness of the issue and to stimulate discussion, to send a clear signal to stakeholders that proper IPR management in open innovation is a policy priority, and to establish minimum standards for this.

It can be useful for governments to establish, possibly in cooperation with other stakeholders, centralized IPR advisory services to which universities and innovative small and medium-sized enterprises, but possibly also larger companies can turn to clarify intellectual property issues in the context of cross-border open innovation.

In view of the fact that cross-border open innovation frequently relies on the sharing of existing intellectual property during research and development or on the deployment of complementary IPRs during the marketing of resulting products, governments should ensure a level playing field for domestic and foreign IPR owners in terms of enforcement.

Scope for international cooperation to solve intellectual property issues in cross-border open innovation

There is a growing body of experience available within the UNECE region, at the level of multinational companies, research organizations, innovative small and medium-sized companies, and government policies. There is therefore significant scope for exchanging experiences, learning from each other and international cooperation in capacity-building.

Another potential area for international cooperation is the harmonization, where appropriate, of IPR laws and particularly the national rules governing intellectual property management at research organizations and in R&D cooperation between research organizations and industry in order to reduce the costs of obtaining protection across national borders and the costs of negotiating cooperation agreements between partners from different jurisdictions.

In recent years, a number of countries in the UNECE region have taken policy measures to improve the framework conditions for knowledge transfer from academia to industry in a national context. Such initiatives include the abolition of the so-called professor's privilege (i.e. the right of professors to claim ownership of intellectual property generated through research under their leadership), the development of commercialization guidelines, model licensing contracts, the creation of networks of technology transfer offices or agencies, the professionalisation of knowledge transfer. In order to make open innovation across borders a reality, these initiatives should be broadened to strengthen their international dimension.

those of maintaining a US patent (European Commission (2008), A more research-intensive and integrated European Research Area – Science, Technology and Competitiveness key figures report 2008/2009).

At the level of the European Union, there are a number of initiatives to provide for trans-national coherence and compatibility, which can serve as useful examples for other countries. Some of these initiatives are also open to participants from non-EU member countries.

These initiatives include pan-European stakeholder associations (such as the European Knowledge Transfer Network ProTon Europe and the Association of Science and Technology Transfer Professionals (ASTP), and the Responsible Partnering initiative), the European Commission's Scientific and Technical Research Committee (CREST), and actions within the promotion of the European Research Area, including the European Institute of Innovation and Technology (EIT) and Marie Curie actions).

Specific initiatives to provide for a more coherent approach to IPR management in pan-European open innovation include the "intellectual property Charter for Europe", the European Commission recommendation on the Management of Intellectual Property in Knowledge Transfer Activities and Code of Practice for Universities and other Public Research Organizations (April 2008), and an associated European Council Resolution (May 2008), the intellectual property management rules for the 7th Research Framework Program, and the CREST toolkit to assist cross-border collaboration between industry and research organizations.

These documents contain key recommendations and good practices on creating a more coherent approach to cross-border intellectual property and knowledge transfer policies.

The EU CREST/ERAC Group on Knowledge Transfer is in the process of developing guidelines for knowledge transfer and intellectual property management in international R&D cooperation between the European Union and third parties.

There is scope for additional international cooperation in adapting and disseminating existing guidelines, recommendations and toolkits.

Given the negative impact which inadequate IPR enforcement can potentially have on cross-border cooperation in innovation, and given the significant and growing international trade in IPR-infringing products, there is also scope for additional international cooperation on strengthening IPR enforcement.

INTELLECTUAL PROPERTY AND COMPETITION POLICY AS DRIVERS OF INNOVATION¹¹

Intellectual property policy aims to encourage innovation by rewarding innovators with temporary market power. Competition policy aims to restrict market power, but encourages innovation by safe-guarding market access for innovative competitors to challenge incumbents. As such, the two areas of law are in principle aligned in their goals. However, striking the right balance between the strength of intellectual property protection and of competition is a constant policy challenge.

The present chapter presents good practices and policy recommendations on intellectual property and competition policy. It is based on the presentations and discussions at the substantive segment of the sixth session of the Team of Specialists on Intellectual Property (TOS-IP) held in Geneva on 21-22 June 2012.¹² It reflects and benefits from the experiences of all relevant stakeholder groups, including national policymakers from intellectual property offices and competition authorities, global IPR owning companies, small and medium-sized enterprises, as well as relevant international organizations.

The chapter is structured as follows. The second section discusses the role of intellectual property and competition policy as key drivers of innovation and knowledge-based development. The third section focuses on unfair competition and intellectual property rights enforcement, i.e. on situations where a competitively weak company misuses a competitor's intellectual property to mislead customers and to thereby gain an unfair competitive advantage. The fourth section discusses good practices on how competition authorities should treat cases involving intellectual property, i.e. situations where a company may be using its own legitimate intellectual property to gain excessive market power. The fifth section focuses on the appropriate balance between competition law and policy on the one hand, and intellectual property law and policy on the other hand, and on policy options to restore this balance if and when it has been upset. The sixth section summarizes the main conclusions and recommendations.

2.1 The Role of Intellectual Property and Competition Policy in Promoting Innovation

Market competition can be thought of as a “stick” which prods companies to innovate. Competition encourages innovation in two ways. First, it pressures companies to introduce new or improved products or services that win them additional customers, or to keep up with the innovations introduced by their competitors. Second, competition creates pressure to reduce the costs or improve the quality of existing products. One way of achieving this is by employing better machinery and equipment or better materials. Thus, competitive pressure in the downstream market can translate into demand for innovations by the upstream

¹¹ This chapter is based on UN document ECE/CECI/2012/4, “Good practices and policy recommendations: IP and the Promotion of Competition as a Driver of Innovation”.

¹² The presentations are available at : <http://www.unece.org/index.php?id=29534>.

manufacturers of the machinery, equipment or materials used to manufacture the downstream product.

It might be tempting to think that competition is a zero-sum game in which one company's gain is another company's loss. However, from a public policy point of view, the benefits of competition do not accrue to companies, but to consumers: everybody gains from the fact that competition induces companies to introduce new, better or cheaper products and services.

If competition is too fierce, if the "stick" is too powerful, companies will be unable to earn a sufficient return on the substantial investments which innovation often requires, because imitators poach customers by selling at lower prices. This may discourage companies from innovating.

Intellectual property rights can address this problem. They grant to inventors or creators a (mostly temporary) exclusive right to the commercial use of their inventions or creations. This exclusive property right protects innovators from imitating competition, and thereby enables them to earn an adequate, risk-adjusted return on their investment. The return on innovation which intellectual property rights promise can be thought of as a "carrot" which rewards innovators.

As such, both competition law and policy, and intellectual property law and policy share the same goal, which is to encourage innovation. Moreover, it can be argued that intellectual property, by virtue of enabling businesses to differentiate their products, promotes competition based on product differentiation and product quality, whereas in the absence of intellectual property, the only viable competition would be cost-based competition in uniform products.

Intellectual property rights may confer a degree of market power, although not necessarily – indeed, usually not – a monopoly. Many intellectual property rights are never practiced and their commercial value is zero. This is the case for roughly 80 per cent of all patents granted. Another 15 per cent have very little commercial value, and only the top 5 per cent have significant value because they confer significant market power.

The degree of market power which intellectual property rights may confer is limited by a number of factors. First, some intellectual property rights, such as trademarks, serve to distinguish the products of one company from those of its competitors. But any company is free to create and register its own trademarks and to compete on that basis. Second, even though one company may have a patent on a certain technology embedded in its product, its competitors may be able to "engineer around" that patent, i.e. they may be able to use alternative technologies to achieve the same or similar properties in their own products. Third, companies usually do not own all the intellectual property rights to the technologies which go into their products. They typically license some of them from other companies. The owners of these technologies often license them to more than one company, enabling the various licensees to compete with each other.

2.2 Unfair Competition Rules and Intellectual Property Rights Enforcement

Unfair competition laws are designed to protect customers from business practices which are intended to gain a competitive advantage by misleading or confusing customers as to the true nature of the product or service they are buying. One example of unfair competition would be if a company uses a name or logo or design which is identical or confusingly similar to those

of a competitor in an effort to pass off its own products as being identical or qualitatively similar to those of that competitor, or of being associated with the brand of a competitor. To the extent that the name, logo or design in question is protected by intellectual property, such as trademarks or registered industrial designs, this would constitute not only unfair competition, but also an infringement of intellectual property rights. As such, intellectual property law and unfair competition law can complement each other in enforcing certain intellectual property rights. The two areas of law are aligned in the goal of promoting innovation in that both unfair competition and intellectual property rights infringements can inflict harm on innovative companies and can reduce their ability or incentives to invest in innovation.

While legal action under the intellectual property laws typically has to be initiated by the legitimate owner of the intellectual property right in question, legal action under unfair competition laws can also be initiated *ex officio* by consumer protection agencies or market inspectorates. However, the remedies available under unfair competition law frequently only extend to injunctive relief against the marketing of the products using confusingly similar trademarks or designs. Intellectual property law by contrast also provides for damages to be paid by the infringer to the lawful owner of the intellectual property rights.

2.3 How to Assess the Competitive Effects of Intellectual Property

From a competition policy point of view, it is today generally accepted that intellectual property rights are not *per se* anti-competitive. Situations where an innovative company has gained a measure of market power by using its intellectual property rights to exclude imitating competitors are not a concern for competition policy, but reflect the intended use of the intellectual property rights granted to the innovator as a reward for his inventiveness, and as an incentive for future innovation.

In particular, a unilateral and unconditional refusal on the part of the owner to make an invention or creation available to a competitor is not considered anti-competitive behaviour because the right to exclude others is the essence and main intended use of any intellectual property right. In fact, if unilateral unconditional refusal to deal was considered anti-competitive, the implication would be that companies have to actively assist their competitors in obtaining access to critical technology. Such active assistance among competitors would fly in the face of vigorous competition and might instead invite collusion.

Still, certain uses of intellectual property rights may create undue or excessive restrictions on competition, and particularly on competition from innovative rather than imitating companies. It is generally accepted that the principles of competition law which apply to the use of other forms of property can be applied to intellectual property cases as well, and that there is no need to establish a separate set of competition law principles just for intellectual property uses.

Nonetheless, leading anti-trust authorities have produced detailed guidelines which explain the principles which they use to assess competition cases involving intellectual property rights. Issuing such guidelines is considered an important good practice because it helps businesses to understand the limits from a competition policy point of view of how they can use their intellectual property rights. This understanding helps them to steer clear of contractual arrangements involving intellectual property which would be likely to run afoul of the competition laws. Thereby a significant source of legal uncertainty and hence business risk is removed.

Potential anti-competitive effects from particular uses of intellectual property arise predominantly when an innovating company uses the intellectual property rights which have been granted to it by the state as a basis for entering into contractual relations with other companies. The terms of such contracts may impose restrictions on the parties, or give rights to the parties, which go beyond the general right to exclude competitors granted by the intellectual property right itself. Licensing contracts are the prime case in point.

Examples of such contractual terms are the following: non-assertion clauses, grantbacks, tying, and bundling.

Non-assertion clauses stipulate that the parties to the agreement will not enforce their respective exclusionary rights against each other. They may be an efficient, pro-competitive solution to eliminate the risk of costly litigation. They may give rise to competitive concerns if used to pre-empt challenges to patents of questionable validity.

Grantbacks are clauses which stipulate that the licensee will give the licensor a license to use any follow-on inventions which the licensee may make based on the licensed technology. They may be an efficient, pro-competitive solution in situations where the success of the licensee's business, and hence his ability to pay royalties to the licensor, depends on successful follow-on innovation. They might have anti-competitive effects if the licensor was able to use them to extend his market power beyond the term of the original patent.

Tying and bundling are contractual arrangements where a license is granted conditional on the licensee either also licensing other intellectual property or buying a product or a service from the licensor. An example would be a computer with pre-installed copyrighted software, where the price of the computer includes a royalty for the software license, so that a consumer can buy the computer only by also licensing the software. Tying and bundling may raise competitive concerns to the extent that the owner of the tying product may be able to extend his market power to the market for the tied product.

The preferred approach to assess the competitive effects of the above (and other) uses of intellectual property is the so-called rule of reason, under which the actual impact of a particular use of a given intellectual property right on the strength of competition in the relevant market is assessed on a case by case basis.

Under the rule of reason approach, the competition authorities or the courts consider both pro- and anti-competitive effects which a particular use of intellectual property may entail, and they consider these effects in a dynamic perspective, i.e. taking into account also effects on innovation and on the intensity of competition in the future.

The main motivation for and advantage of the rule of reason approach is that it reflects the general principle that intellectual property rights, and licensing agreements, are normally considered to be pro-competitive, and that authorities should intervene only when it can be documented that competition is actually being harmed.

There are some exceptions to the application of the rule of reason principle. In most jurisdictions, licensing agreements which directly fix product prices or divide up markets between competitors will be considered anti-competitive per se. Relatedly, arrangements where the owner of a piece of intellectual property agrees to pay another company not to enter the market and not to challenge the intellectual property in court would be likely to be found

anti-competitive. Under a per se rule, the authorities will intervene in these and similar cases without first analysing whether competition in the relevant market has in fact declined.

In some jurisdictions, tying arrangements are also considered anti-competitive per se, if it can be shown that the licensor indeed possesses market power in the market for the tying product.

Another important case where intellectual property uses may be considered anti-competitive is cases of so-called abuse of a dominant position resulting from fraud on the intellectual property office, i.e. cases where an intellectual property right has been obtained illegitimately, and where, therefore, any market power gained on the basis of this intellectual property right is considered abusive.

The general preference for the rule of reason approach notwithstanding, it should be noted that the decisions reached using this approach will only be as good as the analysis of market conditions and competitive effects which underlies it. A rule of reason analysis requires good data on the relevant market, as well as a good understanding of how a given contractual arrangement involving intellectual property affects market outcomes, both immediately and in the longer term. Conducting such analyses requires skill and experience, and can be costly and time-consuming. For countries where competition cases involving intellectual property are still rare or where market and company data may be of relatively low quality, it may be difficult to build up the expertise required for sound rule of reason analyses and to justify the costs. Under such circumstances, per se rules defining certain intellectual property uses as anti-competitive without further analysis may be justifiable as a transitional policy until data and expertise have improved.

2.4 How to Ensure Balance between Competition and Intellectual Property Policy in Favour of Innovation-based Competition

Competition policy and intellectual property policy share the goal of promoting innovation. Yet certain uses of intellectual property rights may negatively affect the intensity of competition in a given market, just as unfettered competition might do. The question of appropriately balancing competition and intellectual property law and policy is therefore a constant policy challenge. As a general principle, intellectual property policy should focus on the appropriate width, depth and length of protection, i.e. on ensuring that the scope of the exclusive rights granted by the state to inventors is conducive to providing incentives for innovation without compromising competition. Competition policy should focus on preventing abuses of intellectual property rights, i.e. on cases where intellectual property rights are used in such a way as to confer market power that goes above what such rights would normally confer.

There has been a trend at leading intellectual property offices of increasing numbers and complexity of patent applications and grants, particularly in information and communication technologies. To some extent this increase in patenting reflects an increase in innovative activity. However, it may also raise concerns from the point of view of competition and innovation policy.

One concern is that the resources available to patent offices to review and assess patent applications may not keep pace with the increase in applications. As a result, the quality of the review process may suffer, and more patents of dubious validity may be granted. The normal mechanism in the patent system to ensure quality is litigation: those patents which turn out to be commercially significant are likely to undergo a second review process in court, when their

validity is challenged by competitors. However, this self-correcting mechanism is not costless. If the average quality of granted patents declines, litigation and its attendant costs increase, and the uncertainty of patent holders about the validity and quality of their patents increases as well.

A proliferation of patents of dubious validity in a given field can open the door for so-called non-practicing entities to extract payments from innovative companies by threatening to sue them for patent infringement. Innovative companies are vulnerable to this threat because litigation might result in preliminary injunctions which would prevent them from marketing their products while the litigation is going on, causing debilitating commercial losses. Non-practicing entities are not deterred by this because they are not marketing any products.

From an intellectual property policy point of view, patent offices should respond to any problems of poor patent quality and uncertain patent validity by investing in improving examinations and opposition procedures and by ensuring that novelty, inventive step and industrial applicability criteria provide adequate thresholds against excessively vague or broad patent grants.

From a competition policy perspective, vigorous market competition can make an important contribution to ensuring patent quality because where competition is strong, patents are more likely to be challenged in court by competitors, and invalid patents are struck down.

There is also concern that the increase in patenting may reflect not so much accelerating innovation, but increasing tendencies to use patents strategically, including possibly to gain illicit competitive advantages by blocking or deterring other innovators.

A proliferation of patents in a given technology field can create so-called patent thickets which greatly restrict the freedom to operate of innovative companies. The cost and time needed to search for possible “blocking” patents relating to a given technology, and of obtaining licenses for such patents before moving forward with one’s own research and development may deter innovation.

A related potential problem arises when, as is frequently the case, the manufacturing of a new product requires access to several or even many patents on complementary technologies owned by many different companies. To the extent that these patents are essential, their owners may all feel that they should be entitled to disproportionate royalties since without their patent, the product could not be made. As a result, the sum of the royalties being asked may drive up costs for the would-be manufacturer to the point where the new product is no longer viable (“royalty stacking”).

Where the number of patent owners involved is not too large, such hold-up problems can often be avoided through cross-licensing agreements, where the parties involved agree to license to each other all the relevant technologies, possibly even free of charge. Where large numbers of patentees are involved, patent pools may provide solutions, where all relevant patents are put together and are made available for licensing as a package.

But cross-licensing agreements and patent pools may give rise to anti-trust problems of their own if the members to the agreement or the pool collectively refuse to license their technologies to non-members, or only offer licenses on terms that are not considered to be fair, reasonable and non-discriminatory (FRAND), thereby preventing non-members from competing on a level playing field in the markets in which the members are active.

This problem is particularly salient when the patent pool forms the basis for an interoperability standard or platform technology, on which future innovations are to be built. From a policy point of view, the challenge is to determine what should be considered fair, reasonable and non-discriminatory terms. The answer will have to be given on a case-by-case basis as a function of the characteristics of the underlying technologies, the market potential of the goods or services to be produced, and the strength of the intellectual property rights involved.

A particular challenge in managing essential intellectual property in standard setting processes is that many standards aspire to global acceptance and validity, whereas intellectual property rights are national, and their validity may vary depending on the jurisdictions for which protection has been sought.

The International Telecommunications Union, one of the major international standard setting bodies, has developed a common patent policy and related guidelines as well as guidelines on software copyright and on trademarks, service and certification marks to foster fair competition among standard users.

The potential damage of hold-up problems to competition can be reduced if courts do not automatically grant injunctive relief, i.e. if they do not block competitors from using the contested intellectual property while the case is being argued.

Competition authorities may also have to take the potential for patent-related hold-up problems into account when assessing mergers and acquisitions between innovative companies.

A relatively new phenomenon related to the increase in patenting in some key technology sectors are so-called “patent wars”, where major technology companies engage in bidding contests for patent portfolios of insolvent companies with the aim of accumulating patents for strategic litigation against competitors. There is a concern that this might change the nature of patents from a “shield” that protects innovators against imitating competition into a “weapon” that strikes at innovation-based competition. There is as yet no established international good practice on addressing this concern.

2.5 Main Conclusions and Policy Recommendations

Competition law and policy on the one hand, and intellectual property law and policy on the other hand, are aligned in their goal of promoting innovation. But certain uses of intellectual property rights may weaken competition, and unfettered competition may weaken innovation. Using the tools of competition law and intellectual property law in a balanced way in the interest of promoting innovation is therefore a constant policy challenge.

The following good practices and recommendations might usefully guide policy in this area:

- The general presumption in competition law should be that intellectual property is not per se anti-competitive. Intellectual property rights do not always confer market power, and when they do, this is in principle desirable as an incentive for innovation and innovation-based competition.
- Intellectual property rights uses may give rise to competition concerns in particular when they are the basis for contractual agreement which create rights or obligations that go beyond those normally conferred by the underlying intellectual property right, or when intellectual property rights are either infringed or obtained illegitimately. This should be the focus of competition policy.
- For the purposes of assessing possible anti-competitive effects of intellectual property, competition law and policy can apply the same principles as are applied to assess the possible anti-competitive effects of other types of property.
- Leading competition authorities assess the competitive effects of intellectual property uses predominantly case by case based on evidence on the actual impact of a particular use of a given intellectual property right on the strength of competition in the relevant market (rule of reason approach).
- They consider as per se anti-competitive only contractual arrangements which amount to direct price fixing or market sharing, and dominant market positions derived from intellectual property rights which were fraudulently obtained.
- Issuing detailed guidelines on the principles underlying competition policy and its enforcement is a good way for competition authorities to assist companies in avoiding contractual arrangements involving intellectual property rights which would likely be considered anti-competitive and thereby preventing competition problems before they arise.
- A proliferation of low-quality intellectual property rights of dubious validity can open the door to anti-competitive scam litigation practices. It is the responsibility of intellectual property offices to ensure the integrity of the patent granting process. Vigorous market competition can also contribute to maintaining patent quality because it encourages court challenges to strike down invalid patents.
- Cross-licensing and patent pools can be an efficient pro-competitive response to the problem that many innovative products require the combinations of large numbers of patented technologies belonging to large numbers of different owners. Competition authorities need to ensure that the members of these arrangements do not unduly block competition from innovative non-member companies, and that the intellectual property included in the arrangement is made available on fair, reasonable and non-discriminating terms. What these terms should be can be determined only on a case-by-case basis.
- Unfair competition laws, which are designed to protect customers from business practices intended to mislead them, can be applied to cases of trademark or industrial design infringements, and can thus complement intellectual property law in the enforcement of intellectual property rights.

RAISING AWARENESS ON THE ROLE OF INTELLECTUAL PROPERTY RIGHTS IN INNOVATION AND THE DANGERS AND ECONOMIC COSTS OF INFRINGEMENTS¹³

The effectiveness of intellectual property in promoting innovation does not only depend on the quality of the legal and policy framework per se, but also on the way in which businesses and consumers use – or fail to use – the intellectual property system. There is a large body of evidence from across the UNECE region showing that both businesses and consumers are often not aware of the potential benefits and limitations of intellectual property, and of the policy instruments available to support them in making the best possible use of it.

The present chapter is based on the presentations and discussions at the substantive segment of the fifth session of the UNECE Team of Specialists on Intellectual Property held in Geneva on 7-8 July 2011.¹⁴ It reflects and benefits from the experiences of all relevant stakeholder groups, including national policy makers, global IPR owning companies, small and medium-sized enterprises, the academic community, as well as relevant international organizations.

The chapter is structured as follows. It begins with some general remarks on the importance of IPR awareness raising and then presents good practices and policy recommendations on awareness raising in the following three areas: the dangers and economic costs of IPR infringements; the role of IPR in technology transfer and innovation; and how small and medium-sized enterprises and entrepreneurs can access the IPR system and can manage IPR for business development.

3.1 The importance of IPR awareness raising and the case for policy support

Intellectual property rights regimes provide a legal framework within which innovators can obtain (sometimes temporary) exclusive rights to the commercial use of their inventions. Formal IPR provide legal titles that can in principle be enforced in court against infringement by third parties. Moreover, in many jurisdictions some forms of infringement are considered as crimes, entailing prosecution by the law enforcement authorities.

However, experience suggests that with any set of laws, rules or rights, applying and enforcing them will be relatively straightforward, cost effective and harmonious if the laws, rules or rights in question are generally perceived as broadly legitimate and beneficial to society at large. By contrast, application and enforcement tend to be difficult, expensive and contentious if the laws, rules or rights in question are perceived by a significant part of the population as lacking

¹³ This chapter is based on UN document ECE/CECI/2011/8, "Good practices and policy recommendations on raising awareness of the role of intellectual property rights in innovation and the dangers and economic costs of intellectual property rights infringements".

¹⁴ The presentations are available at: <http://www.unece.org/ceci/documents/2011/ipr/session5tosip11.html>.

legitimacy or not benefiting them. Where this is a problem, raising awareness about the true nature of the laws, rules and rights in question and about the benefits they bring can be part of the solution.

In the field of intellectual property, significant problems of both application and enforcement exist in many countries. Copyright piracy and trademark counterfeiting are a growing problem, in part because there are plenty of enthusiastic customers of infringing products. In academic settings, researchers frequently are unenthusiastic about IPR protection and commercialization, thereby compromising knowledge transfer. And many small and medium-sized entrepreneurs do not use IPR, thereby foregoing opportunities for growing their businesses. In all these cases, initiatives that raise awareness about the economic and potential health and safety damages of infringements and about the benefits of IPR in terms of stimulating innovation, creating jobs and stimulating economic growth can be part of the solution.

There are two reasons why policy makers at various levels may want to consider supporting IPR awareness raising. The first is that the effectiveness of awareness raising generally depends on the credibility of the messenger. Policy can play a crucial role on the one hand in encouraging awareness raising campaigns to provide a fair and balanced view of the benefits of IPR to society and the damages of infringements, and on the other hand in lending impartiality to such campaigns.

The second reason why policy support at appropriate levels may be required is that the benefits of enhanced IPR awareness are frequently shared broadly, and that, without policy support or coordination, interested private parties may be tempted to free-ride on awareness raising campaigns mounted by others, rather than contributing to the costs of such campaigns, a problem that could lead to awareness raising remaining under-funded and ineffective.

3.2 Raising awareness of the dangers and economic costs of IPR infringements

The international trade in copyright infringing products (piracy) and trademark infringing products (counterfeiting) has been growing in absolute size and in the number and types of products it is affecting. It is no longer confined to luxury products and medicines, but has branched out into virtually the entire product space, including everyday consumer products, foodstuffs, toys, electrical appliances, machinery and equipment and spare parts.¹⁵

Counterfeiting and piracy are highly footloose industries, where producers move with relative ease between host countries in response to variations in enforcement intensity. They are also globalised activities where production of components and assembly are often geographically separated, and where counterfeit and pirated goods often cross many borders before reaching their final destination, all in an effort to avoid detection and prosecution.

Counterfeiters and pirates have also diversified their distribution channels from traditional high-volume shipping to advertising and selling over the internet, electronic distribution of movies, music, and software, and small-sample shipping via mail delivery services in an effort to increase the costs of monitoring and intercepting IPR infringing shipments.

¹⁵ And even counterfeit hotels and consulting companies.

Due to the above developments, legitimate copyright- and trademark-based companies and IPR enforcement authorities, such as customs agencies, police, and internal market surveillance authorities, are being faced with increasing case loads and rising enforcement costs. The response has focused mostly on deploying additional financial and human resources to monitor, intercept, and destroy IPR infringing goods and to prosecute infringers, and on stepping up both the cooperation between business and the various national enforcement agencies, and the international cooperation on this front. This has also been the main focus of TOS-IP's work on IPR enforcement.

However, the international experience to date suggests that the above response is likely to remain inadequate because it focuses solely on the supply side of the problem, i.e. on preventing infringing products from being manufactured, marketed, distributed and sold.

Available evidence suggests that where there is a demand for a product, the market will tend to find ways to supply it. The costs of curbing this supply will be high, and in the case of some countries with economies in transition, as well as for many smaller companies, prohibitive. Any lasting solution to the problem of trademark counterfeiting and copyright piracy will therefore also have to involve curbing the demand for such goods.

Counterfeiting today is not confined to consumer products only. It has also affected product categories typically purchased by enterprises or even government procurement offices. Awareness raising campaigns therefore need to be devised also for these categories of potential customers. By the same token, awareness raising campaigns may have to also target policy makers in order to strengthen the political support for IPR enforcement.

One important avenue through which to raise awareness is by educating potential customers about the threats that counterfeits pose for innovation, creativity, economic development, and consumer health and safety. It is important in this regard to recognize that these threats differ across different types of products, and that they may resonate differently with different types of customers.

The argument that piracy and especially counterfeiting undermines legitimate innovative businesses and thereby jeopardizes one of the main sources of economic development is applicable to virtually all product categories. Where the customers of the counterfeiters are other businesses or governments, rather than individual consumers, as is frequently the case for machinery and equipment and their spare parts, these economic arguments tend to work well. However, the international experience suggests that it can be a challenge to use economic arguments to convince consumers to stop buying counterfeit products because they may prefer to think that their own individual purchase will not have any significant effects, or that any negative effects of their purchasing decision will befall mainly foreign companies or economies.

The argument that IPR infringing products pose threats to consumer health and safety frequently resonates more powerfully with consumers than the above economic arguments. However, awareness raising campaigns cannot be based on such arguments for products where such threats do not exist, such as for pirated music or movies.

More generally, the international experience suggests that in order to be successful, it is important for awareness raising campaigns to present a realistic picture of the economic damage

and health and safety threats of IPR infringing products. In the past, some industry associations have operated with unverifiable claims about these costs and threats, and this may have undermined rather than supported consumer acceptance of IPR.

Mounting effective awareness raising campaigns is further complicated by the fact that potential customers are highly heterogeneous. Experience shows that in order to create effective awareness raising campaigns, it is essential to know as much as possible about the target audience and to tailor campaigns accordingly.

One key aspect in this regard is customer purchase motivation. One obvious distinction here is the one between consumers on the one hand, and companies and governments on the other hand. Among consumers, it has proved critical to distinguish between those seeking a cheaper version of a product, those seeking fast and easy access (for instance through file sharing), and those who simply enjoy "beating the official system" (so-called Robin Hoods). Awareness raising campaigns also should differentiate between "complicit" buyers, who know that they are buying fake products, and "naive" buyers, who buy fake products unknowingly;

In order to identify the most effective message to convince a given target audience to stop purchasing IPR infringing goods, it is often useful or even imperative to commit resources to a preliminary field study to correctly and completely understand the characteristics and motivations of the target audience, and to design the awareness campaign on this basis. Campaigns which fail to tailor the main message to the characteristics and motivations of the audience may not only be ineffective but may even backfire, i.e. strengthen rather than weaken customer motivation to buy IPR infringing products.

Not all consumers who buy IPR infringing goods do so in order to save money or because they do not know they are buying fakes. Some consumers do so because they have never developed a respect for intellectual property and feel entitled to cheap or even free products that infringe IP. Such attitudes are usually formed at a relatively early age and may prove difficult to change later on. There is therefore a growing number of initiatives to incorporate IPR awareness raising in school curricula in order to reach students at an early age.

In addition to educating potential customers about the dangers of counterfeits and pirated products, companies also need to make sure that legitimate products are sufficiently attractive to consumers relative to counterfeit or pirated alternatives. This may involve tailoring the packaging, package sizes, modes of delivery, or pricing to different markets and customer groups, including appropriate international pricing strategies and policies on re-imports.

The international experience shows that there is no general answer to the question which entities should engage in customer awareness raising. There are examples of campaigns run by industry associations, by enforcement authorities, such as the police, by intellectual property offices, by governments and by coalitions of different stakeholders. By the same token, awareness raising campaigns can be local, national or international. The involvement of different stakeholders and the geographical reach of the campaign will have to depend on the degree to which they are affected by the problem of counterfeiting and piracy, the extent of their knowledge of the target audience, and the credibility with which they can transport the message.

Experience suggests that one challenge in this regard has been to engage consumer associations in IPR awareness raising campaigns. Engaging these associations is desirable because they are close to consumers, have significant knowledge about them, and enjoy credibility. At the same time, consumer associations have frequently been reluctant to engage in such campaigns precisely because their mission is to represent consumer interests, often in disputes with companies, and much like the consumers who would be the ultimate targets, consumer associations lack awareness about the economic cost and potential safety and health risks of IPR infringing goods. It may therefore be necessary in a first step to include consumer associations in the target audience of an awareness raising campaign, before they can become partners at a later stage.

Counterfeiters and pirates increasingly use the internet as a channel to advertise, market and sell their products. This activity is difficult for national authorities to curb or regulate because websites that offer counterfeits and pirated products are easy to set up and to move to servers in jurisdictions where enforcement is ineffective. However, the fact that the internet has become an increasingly important conduit for counterfeiting and piracy can also be used for IPR awareness raising. There is a growing number of examples where either rightsholders or enforcement authorities have set up decoy websites, which pose as sites where consumers can purchase counterfeits or pirated products, but which then lead the consumer to a site which educates on the dangers and costs of these products.

A good practice which combines enforcement actions with elements of public awareness raising on the problem of counterfeiting and piracy consists in destroying seized counterfeit and pirated materials in public in a highly visible way and to use the occasion to engage the media to transport the message about the dangers and costs of IPR infringements.

An important caveat to be kept in mind is that IPR awareness raising campaigns targeting consumers are a relatively recent development. Examples targeting companies or government procurement offices as customers are still rare. As a consequence, knowledge on the impact of such campaigns in terms of actually reducing the demand for counterfeit and pirated goods is still quite limited. In part this is also due to the fact that even otherwise well-designed campaigns frequently lack a built-in evaluation mechanism which would track impact and allow to learn from experience for subsequent campaigns. Incorporating systematic evaluation and learning into awareness raising campaigns is therefore considered good practice.

3.3 Raising awareness among academics of the role of IPR in technology transfer and innovation

Leading economies spend significant amounts of resources on research at public and private research institutions. The fruits of this research can have important commercial applications. However, experience suggests that it takes an active policy, again supported by significant resources, to transfer these research results to the business sector for commercial exploitation.

Intellectual property rights have a key role to play in this process because they secure temporary, transferable exclusive rights to the commercial exploitation of a research result. They are therefore essential both for licensing new technologies to existing businesses for

commercialization, and for raising funding for new start-up companies to exploit such technologies.

However, the protection of research results by means of formal IPR often faces significant obstacles at research organizations. Scientists are motivated typically by the quest for new knowledge. They are not primarily interested in monetary rewards, and they are frequently not very entrepreneurial. Some erroneously see the process of obtaining formal IPR protection for their research results at best as an unnecessary nuisance that takes their valuable time away from research, and at worst as something that runs counter to the goals of academic research by preventing scientists from publishing their results and accessing and using the results of their peers.

The challenge for university knowledge transfer managers and for university top management therefore is to make scientists aware of how IPR protection and IPR management can actually advance their research and career interests and to thereby turn passive resistance to IPR protection policies into active support.

The key benefits which researchers can obtain from the protection and commercialization of IPR, and on which university awareness raising campaigns can focus, are more research cooperation with industry, more industry financing for research projects, new research ideas from interactions with industry researchers, the validation of research results through industrial application, and financial rewards by sharing in the proceeds of successful commercialization. For students, such cooperation is attractive because they can generate critical job market opportunities. Cooperation with industrial research partners in awareness raising may therefore be helpful.

Experience suggests that in order for IPR awareness campaigns to be effective, they need to be seen to be supported throughout the research organization from the top down. Knowledge transfer is an activity which requires upfront investment in order to yield benefits - for the research organization and society - in the medium to long term. For this upfront investment to yield an adequate return, all relevant departments must get actively involved in the knowledge transfer process. It is frequently not enough for the knowledge transfer office to campaign in favour of IPR protection as part of this upfront investment. If left to its own devices, its message is in danger of being ignored by academic departments which pride themselves on their independence and may prefer to focus on their purely academic tasks. It is therefore important for top management to consistently send the message to all departments that successful IPR management is viewed as critical for the organization as a whole.

The credibility, and hence success of IPR awareness raising efforts also depends critically on how well the message is aligned with the actual practices of the research organization. This means for instance that the knowledge transfer office must be endowed with sufficient financial and human resources to effectively identify commercially promising research results, to protect them with IPR, and to successfully commercialize them. Where these resources are lacking, it will be very difficult to persuade researchers to cooperate on IPR protection.

Relatedly, the effectiveness of IPR awareness raising in academic settings also depends on the proper alignment of career incentives provided to researchers. If career incentives remain geared exclusively towards purely academic achievements, no amount of awareness raising will succeed

in inducing researchers to devote time and effort to IPR protection and knowledge transfer. It is therefore considered good practice to fully integrate IPR management into the internal value system of the research organization. This means that research organizations should be prepared to recognize achievements in knowledge transfer on an equal or similar footing with scientific publications or work in the institutions self-administration.

Leading examples of IPR awareness raising in academic settings do not focus only on explaining to researchers the potential benefits of IPR protection and diffusing concerns, such as those about publishing delays. Instead, they also raise awareness among researchers about how to go about IPR protection and management. This includes explaining the process from the discovery of a research result to its disclosure to the knowledge transfer office, the first assessment of the commercial potential, the development of a commercialization strategy, including IPR protection, in consultation with the researchers, the IPR protection itself, such as the drafting of a patent application, and the eventual revenue sharing policies. It also includes explaining the support institutions and resources available to researchers.

In a similar vein, leading awareness raising programs also do not only focus on the protection through IPR of research results generated at the institution itself. They also raise awareness of the risk to which the institution and its researchers could be exposed from infringing the IPR of third parties. A key component of IPR awareness raising in research organizations therefore is to explain the need for IPR due diligence in the design of research projects, and in research cooperation, in order to make sure the institutions involved obtain legal rights to the use of any inputs they may need to carry out their own research and which may be protected by third party IPR, such as copyrighted databases or patented research technologies.

Another instance where researchers need to be made aware of the need to respect the rights of other parties is research cooperation with industry, where the industrial partner may acquire certain rights to the results of the research. Among other things, this may affect the perceived conflict between the pressure to publish to advance academically and the need to delay publishing until a patent has been filed. Where cooperation partners acquire certain rights to the use of research results, the alternative to patenting frequently is not that the results can be published freely, but that the industrial partner requests certain results to be kept secret and not be published at all in order to safeguard their commercial interests.

IPR awareness raising programs in research organizations need to be tailored to different academic fields because fields differ in the kinds of knowledge they generate, the appropriate conduits for knowledge transfer to industry and society at large, and the appropriate types of IPR needed to facilitate this process. By the same token, such programs should be tailored to the mission of the research organization in question and to its main areas of strength.

Leading research institutions are increasingly expanding their IPR awareness raising campaigns beyond their own researchers to include students from the time they enter university. Some are even extending such campaigns to high schools.

As in the case of IPR awareness raising for customers, it is advisable to incorporate impact assessments and systematic learning in academic IPR awareness raising programs.

3.4 Raising awareness among small and medium enterprises and entrepreneurs on how to access the IPR system and how to manage IPR for business development

Generally, the vast majority of small and medium-sized enterprises in an economy do not make regular and extensive use of the formal IPR system. This is true throughout the UNECE region. To a considerable extent this state of affairs simply reflects the fact that most small and medium-sized enterprises are not very innovative and therefore do not have a systematic need to protect inventions through formal IPR.

However, in leading economies there is typically a relative small percentage of small and medium-sized enterprises (SMEs) which are very dynamic and highly innovative and which have the potential to grow into large companies and to contribute substantially to net job creation and economic growth. Nurturing such enterprises should be a key objective of economic policy.

Depending on the industry and the country in question, some of these enterprises are systematic users of the formal IPR system. However, the available evidence from a large number of countries suggests that even actually or potentially innovative SMEs frequently face a number of obstacles when trying to make use of intellectual property (IP) for growing their business, and that these obstacles may actually hold back innovation, job creation and growth.

Lack of IPR awareness is one of these obstacles. SMEs and entrepreneurs frequently lack a coherent IP management strategy, they lack adequate knowledge to develop and manage their IP portfolios, they do not fully understand the formal IPR system, and they do not fully understand the resource requirements for adequate IPR protection and enforcement.

These problems are compounded when SMEs are operating on international markets where they need to deal with several different national IPR systems.

Lacking IP awareness not only prevents SMEs and entrepreneurs from fully exploiting their own innovative potential. It can also cause them to inadvertently infringe on the IPR of third parties, leading to potentially very costly legal disputes. Again, this problem is compounded when SMEs are entering international markets.

IPR awareness raising programs for SMEs and entrepreneurs therefore need to start by explaining both the tangible economic benefits which IPR can bring to a company and the potentially serious negative consequences of neglecting IPR issues, and then move on to laying out the resources available to support SMEs in IPR management.

There is a considerable heterogeneity in how SMEs are using and should be using IPR depending on factors such as industrial sector, size, innovative activity and whether they operate nationally or internationally. Well-designed awareness raising programs need to adequately take this heterogeneity into account.

Generalized, public "one-size-fits-all" campaigns can do no more than alert some SMEs to the issue. To induce changes in their approach to IPR management will typically require a more tailored "personalized" approach relying on direct contacts with SMEs and finding out what their more specific needs are.

A key challenge in this regard is how to reach SMEs and entrepreneurs. Many awareness raising programmes struggle to reach their target audiences because they are being offered by intellectual property offices interested in expanding their customer base. Those SMEs that are not currently using IP, and therefore are not in regular contact with IP offices to begin with, often fail to notice these programmes. There is therefore a need for awareness raising programmes to be designed and delivered in partnership with enterprise promotion agencies, SME associations, business angel networks (where they exist) and other entities that are already in regular contact with SMEs, including SMEs that are not currently using formal IPR.

For the same reason, well-designed awareness raising campaigns *inter alia* aim to work with professionals who regularly provide services to SMEs and entrepreneurs, such as lawyers, accountants, engineers, designers so that they can routinely incorporate IPR management into their interactions with SMEs. To achieve this, it may be necessary to also raise the IPR awareness of these professionals.

In part related to the fact that many SME awareness raising programs are offered by IP offices, the vast majority of support programmes currently available focus largely on patenting. This is unfortunate because evidence from many countries suggests that patenting is less important for most SMEs than other forms of formal and particularly also informal IP, such as secrecy, lead time advantages, design complexity etc. Awareness raising and other support programmes should be designed so that they are broad enough to cover the whole range of formal and informal IP protection mechanisms that may be relevant to SMEs.

Another reason why IP offices should consider cooperating with enterprise promotion agencies and other business professionals in designing and delivering SME awareness raising and education programmes is to make sure these programs do not only present the issue from a strictly legal point of view, but incorporate a genuine business focus and are presented in a way that is readily accessible to busy entrepreneurs.

A strong business focus is recommended *inter alia* because of the dynamic nature of the innovation process and the constant changes in innovation models used by innovative SMEs. Changes in the innovation process may require corresponding changes in how intangible assets need to be protected and managed. Well-designed awareness raising campaigns need to be sufficiently flexible and up to date to keep up with these changes.

A critical element for the success of awareness raising programs is also that they are closely integrated with tangible IPR support programs, such as programs that provide professional advice on specific IPR management questions, or subsidies which help to contain the costs of IPR protection. Closely integrating these two kinds of programs has the advantage that it assists SMEs to move rapidly from the realization that IPR can have important benefits for their business to concrete actions that help them realize these benefits. This can significantly enhance the chances that awareness raising programs lead to actual changes in behaviour.

3.5 Concluding remarks

IPR awareness raising is an important challenge in all three areas covered in this chapter, i.e. in the consumer sphere, in academic research settings and for SMEs and entrepreneurs. Beyond the specifics of each of the above areas, there are a number of common threads that emerge from a review of good practices and policy experiences. Among these are the following:

- The general rationale for awareness raising campaigns is to facilitate the application and enforcement of IPR by increasing understanding and acceptance of IPR among key stakeholder groups.
 - Policy support at appropriate levels may be needed to ensure the credibility of campaigns and to overcome free-rider problems.
 - In order to be effective, awareness raising campaigns should be based on a thorough understanding of the characteristics, motivations and needs of the target audiences and need to tailor their messages accordingly.
 - Effective delivery of awareness raising campaigns often requires cooperation between various stakeholders with complementary expertise, including public-sector and private-sector stakeholders.
 - The chance that awareness raising programs do lead to changes in behaviour is enhanced if they go beyond explaining the benefits of IPR and the drawbacks of infringement, and also educate about available support institutions and programs that can assist the target audiences in realizing the benefits and avoiding the drawbacks.
 - Awareness raising programs cannot compensate for misaligned incentives. These programs must be seen as complementary to policies that align the incentives of target audiences in favour of optimal use of IPR, such as policies that make legitimate products attractive relative to fakes, or policies that reward university researchers for active IPR protection.
 - A frequent problem even in well-designed awareness raising programmes is that the impact of these programmes is not being systematically assessed and that opportunities for learning and improving such programmes are not being fully realized. The implication is that systematic evaluation and impact assessment should be incorporated into awareness raising programs wherever possible.
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Innovation and Intellectual Property

Good Practices and Policy Recommendations

This publication is part of an ongoing series highlighting some of the results of the UNECE Subprogramme on Economic Cooperation and Integration. The objective of the Subprogramme is to promote a policy, financial and regulatory environment conducive to economic growth, knowledge-based development and higher competitiveness in the UNECE region.

It covers different thematic areas related to this objective including innovation and competitiveness policies, entrepreneurship and enterprise development, financing innovative development, public-private partnerships for domestic and foreign investment, commercialization and protection of intellectual property rights.