AUTHORS:
Svetlana Avdasheva
Rochelle Dreyfuss
Igor Drozdov
Aleksey Ivanov
Polina Kryuchkova
Ioannis Lianos
Sergey Plaksin
Andrey Shastitko

Intellectual Property and Development: Time for Pragmatism

2013

"[I]ntellectual property is one of the most important aspects of globalization... How we regulate and manage the production of knowledge and the right of access to knowledge is at the center of how well this new economy... works and of who benefits."

Joseph Stiglitz, Nobel laureate in Economics

Sk Skolkovo

Opening Statement

Igor Aleksandrovich Drozdov

Aleksey Yurievich Ivanov

For the past 20 years, aligning the institution of intellectual property (IP) in Russia with the best international standards has been a recurring theme. The adoption of Part 4 of the Civil Code of Russia was a key milestone in that process.

In recent years, Russian legislators have primarily focused on creating a coherent system of laws modeled after foreign systems. This has been considered a natural method of legislating, due to the peculiar difficulties of implementing catch-up development while assessing the needs of the Russian economy and Russian society at a time of rapid social change.

The drawback to this approach is a series of inconsistencies between the provisions of intellectual property law and the actual needs of the Russian economy and society.

One of the most important issues we face is the urgent need to steer the Russian economy onto a path of innovative development. The institution of intellectual property can play a meaningful role in this process. For example, in the United States, one of the key factors to Silicon Valley's innovative breakthroughs and successes is intellectual property protection regulation, which underwent a number of important changes designed to encourage technological innovation.

A catch-up model of development has many negative effects. In most developed countries, which over the course of the twentieth century created a heavy-handed system for regulating intellectual property, the system, as it is currently drafted, is stifling economic development. Fascinated with duplicating foreign standards, Russian legislators often failed to take into account the possibility for harmonious development, which Russia can experience without borrowing from the outdated industrial-era institutions of the Western world.

In today's world, the institution of intellectual property plays a very important role in the redistribution of resources within the global economic system. As Nobel laureate economist Joseph Stiglitz writes, "[g]lobalisation is one of the most important issues of the day, and intellectual property is one of the most important aspects of globalisation, especially as the world moves toward a knowledge economy. How we regulate and manage the production of knowledge and the right of access to knowledge is at the centre of how well this new economy, the knowledge economy, works and of who benefits. At stake are matters of both distribution and efficiency."

Unfortunately, many decisions related to intellectual property in Russia were made without considering all of these issues. This is clearly evidenced by the decision to adopt and use the regime of national (regional) exhaustion of exclusive rights in Russia (2002), the very subject that we write about in our detailed research.

The pragmatic assessment of gains and losses that specific regulations have had on the Russian economy and society must become the focus of the next phase of developing the institution of intellectual property in Russia.

The Skolkovo Foundation, together with the National Research University – "Higher School of Economics", and colleagues from the world's leading universities – University College of London and New York University – has conducted Russia's first comprehensive interdisciplinary study on the impact the institution of intellectual property has had on social development and innovative activities.

We hope that this study will serve as a starting point for further thoughtful development of the Russian national strategic vision in the field of intellectual property – one of the most important sectors of the global world order.

Sincerely,

I.A. Drozdov
A.Y. Ivanov

Authors

Svetlana Borisovna Avdasheva

Higher School of Economics,
Professor.
HSE Institute for Industrial and Market Studies, Deputy Director.
PhD in Economics

Rochelle Dreyfuss

New York University School of Law, Pauline Newman Professor of Law.
Engelberg Centre on Innovation Law and Policy, Co-director

Igor Aleksandrovich Drozdov

Skolkovo Foundation,
Senior Vice President.
PhD in Law

Aleksey Yurievich Ivanov

Skolkovo Foundation,
Director of the Legal Policy and Social Development Department.
Harvard University LL.M.

Polina Viktorovna Kryuchkova

Higher School of Economics, Professor.
HSE Institute for Industrial and Market Studies, Senior Researcher on competition and antitrust policy.
PhD in Economics

Ioannis Lianos

University College of London
Faculty of Laws, Reader.
Centre for Law, Economics & Society, Director.
Doctor of Philosophy

Sergey Mikhaylovich Plaksin

HSE Directorate for Analytical Studies, Deputy Director.
HSE Centre for Analysis of Executive Authorities Activity, Director of Organisational Design Unit.
PhD in Economics

Andrey Yevgenyevich Shastitko

Moscow State University, Professor.
RANEPA Centre for Research on Competition and Economic Regulations, Director.
PhD in Economics

Research Participants:

Tatyana Beznoshchenko	Student, Higher School of Economics
Nadezhda Galiyeva	Junior Research Fellow, Centre for Federal Research Methodology, Russian Presidential Academy of National Economy and Public Administration
Malika Gorlanova	Graduate Student, University College of London
Alexander Ioffreda	Student, Harvard University, B.A. Candidate in Economics. Intern at the Department of Legal Policy and Social Development, Skolkovo Foundation
Anastasia Komkova	Graduate Student, Moscow State University
Lyubov Korotetskaya	Department of Legal Policy and Social Development, Skolkovo Foundation. Postgraduate Student, Moscow State University of International Relations
Aleksandr Kurdin	PhD in Economics. Head of Directorate for Strategic Research in Energy at Analytical Centre under the Government of the Russian Federation. Research Fellow at the Centre for Studies on Competition and Economic Regulation, Russian Presidential Academy of National Economy and Public Administration
Ruslan Levitskiy	Consultant at the Directorate for Competition Policy of the Analytical Centre under the Government of the Russian Federation. Postgraduate student, the Department of Applied Institutional Economics, Faculty of Economics, Moscow State University
Sergey Litvintsev	Deputy Director at the Legal Policy and Social Development Department, Skolkovo Foundation. Duke University LL.M.
Kseniya Manuilskaya	Research Fellow at the Centre of Federal Research Methodology, Russian Presidential Academy of National Economy and Public Administration
Kirill Piksendeyev	Coordinator of the “Business Twenty” (B20) Task Force on innovation and development. Intern at the Department of Legal Policy and Social Development, Skolkovo Foundation
Dmitry Rogozin	PhD in Sociology. Dean of the Social Sciences Faculty, Moscow School of Social and Economic Sciences. Director, Centre of Federal Research Methodology. Russian Presidential Academy of National Economy and Public Administration
Anastasia Shastitko	Graduate Student, Université Paris 1 Panthéon–Sorbon

Authors express their gratitude to all participants of the research project.

Contents

I. The institution of intellectual property and innovative development of Russia 9

1. The institution of intellectual property in Russia 10

1.1. The structure of the Russian economy and demand for RIA 11
1.2. The principal arguments for the analysis of intellectual property rights protection policies in Russia 17
1.3. Narrowing the subject of study: problems of economic and legal interpretation 18
1.4. Comparative analysis of intellectual property rights specification and protection methods; analysis of the market, hybrid and hierarchical transaction management mechanisms for transfer of intellectual property rights 20
1.5. Incentives, costs, and benefits to different stakeholder groups 22
1.6. The balance between RIAMI rights protection policies and other aspects of economic policy 23

2. The balance between RIAMI rights protection and competition promoting policies 26

2.1. Protection of competition versus intellectual property rights: problem statement 28
2.2. Do we need exceptions for RIAMI in Russian antitrust law? 30
2.3. The protection of the rights to RIAMI in an international context 32
2.4. Economic theories on antitrust exemptions 33
2.5. Evaluation of the Russian discussion on RIAMI rights protection issues in the antitrust policy 35
2.6. RIAMI rights protection in the context of Russian competition policy: primary conclusions 36

References 37

II. Parallel import: busting the myth 45

1. Parallel import as a legal phenomenon 47
2. Political and economic aspects of parallel import regulation 51
3. The prohibition of parallel imports and its influence on Russian innovative companies 56

References 67

III. New challenges in the intersection of intellectual property rights and antitrust legislation: a view from Europe and the United States 71

Review: "New challenges in the intersection of intellectual property rights and antitrust legislation – view from Europe and the United States" 73

I. Introduction 79

II. The interaction between horizontal IP rules and sector specific IP regimes 85

A. Validity 86
1. Patentable subject matter 86
2. Novelty 88
3. Nonobviousness (inventive step) 88
4. Utility (industrial application) 89
5. Disclosure (specification) and claiming 89

B. Infringement 90
1. Claim interpretation 90
a. Literal infringement 91
b. Infringement under the Doctrine of Equivalents (DOE) 91
c. The reverse Doctrine of Equivalents 92

2. Parties to infringement 92

C. Defenses to infringement 93
1. Socially significant uses 93
a. Research 93
b. Diagnostics 94
c. Supplying the market 94
d. Working 94
2. Government use 94
3. Prior users 95
4. Bad acts 95

D. Remedies 95
1. Injunctive relief 95
2. Monetary damages 96
3. Border actions 96

E. Government funded inventions 96

III. The interaction between competition law and IP law 99

A. Legal framework and goals of competition law 100

B. The intersection between competition law and intellectual property: principles 103
1. The thesis of a "unified field" and the persistence of conflicts 103
a. Competition law, IP rights and the common objective of economic welfare 103
b. Intellectual property, competition and cumulative innovation 104
c. Exclusionary theories of anticompetitive effects and intellectual property rights 105
(i) The leverage theory 105
(ii) The essential facilities doctrine 105
(iii) Raising rivals' costs 106
(iv) Maintenance to monopoly 107
2. The focus on static allocative efficiency analysis in competition law 107
a. IP rights are not monopolies 107
b. The property rights character of IP rights should not provide competition law immunity 108
3. Standards for the interaction between competition law and IP rights 110
a. Formalistic standards for the IP competition law interface 110
(i) Standards focusing on the scope or value of the IP right 110
(ii) Standards focusing on the intent of the IP holder 113
b. Economic balancing tests 113
c. Competition law and the turn to dynamic analysis 117
(i) "Dynamic competition" as a criterion of competition law analysis 117
(ii) Technology and innovation markets in US and EU competition law 119
(iii) Dynamic analysis in the context of competition law assessment in merger control and antitrust 121
d. The need to apply an overall "decision theory" framework 122

C. Illustrations of the interaction between competition law and IP rights: a comparative EU/US perspective 125
1. The patenting process and unreasonable patent exclusions 125
a. Refusal to license 125
b. Anticompetitive abuses of the IP system 127
2. The "Innovation Commons" 130
a. Patent pools and cross licensing 131
b. Standard setting and other forms of technology sharing 132
c. (F)RAND licensing obligations 134
d. Price fixing and horizontal market restraints 136
e. Joint ventures 137
3. Tying and interoperability 137
a. Patent ties 137
b. Technological tying 138
c. Package licensing 139

4. Pricing IP rights and competition law 140
a. Royalty stacking, excessive royalties and price discrimination 140
b. Post-sale restraints on IP distribution 144
(i) Resale price maintenance of IP protected goods 144
(ii) Vertical territorial limitations 144
(iii) Vertical customer restrictions and field of use restrictions 144
5. IP settlements and competition law 145

IV. Exhaustion (First Sale) 149

V. Governance issues 155

A. Improving the governance of the intellectual property system 156
1. The role of the USPTO 156
2. The role of the courts 157

B. Improving the interaction between competition law and IP law 158

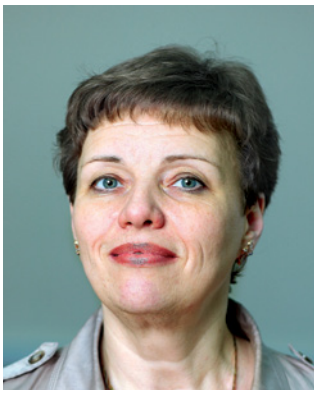
VI. Conclusion 163

References 169

The Institution of Intellectual Property and Innovative Development of Russia

1. The Institution of Intellectual Property in Russia

Translation from Russian



Svetlana Borisovna Avdasheva

Higher School of Economics, Professor.
HSE Institute for Industrial and Market Studies, Deputy Director.
PhD in Economics

Polina Viktorovna Kryuchkova

Higher School of Economics, Professor.
HSE Institute for Industrial and Market Studies, Senior Researcher on competition and antitrust policy.
PhD in Economics

Sergey Mikhaylovich Plaksin

HSE Directorate for Analytical Studies, Deputy Director.
HSE Centre for Analysis of Executive Authorities Activity, Director of Organisational Design Unit.
PhD in Economics

Andrey Yevgenyevich Shastitko

Moscow State University, Professor.
RANEPA Centre for Research on Competition and Economic Regulations, Director.
PhD in Economics

1.1 The Structure of the Russian Economy and Demand for RIA

The specific features of Russia's economic development, individual economic sectors, (e.g. their technological framework), demand for universal legal protection of the results of intellectual activity (RIA), and demand for alternative methods of supporting developer rights are all closely interrelated.

Russia's economic development is underpinned by a few sectors related to the production and upstream processing of primary goods, or at best the production of low value added products. The manufacturing sector's share of GDP is relatively low, as is the service industry's (Fig. 1). At the same time, the export of hydrocarbons and other low value added products make up a large share of GDP (Fig. 2).

In a majority of these sectors, production is driven by a handful of large companies that use traditional technologies. In such markets, outsiders are rare and their hold is considerably restricted. This sectoral structure significantly affects demand for legal protection of RIA primarily because innovation costs themselves are relatively low (Fig. 3), with a large part compensated by public funds (Fig. 6)

There is little demand for RIA from large, influential companies in Russia, as they are not among RIA suppliers for the domestic market. Their demand for products that require RIA in order to be manufactured domestically is likewise low. Certainly they have a demand for cutting-edge technologies but primarily for those embedded in hardware. As regards hardware, Russian production companies prevailingly use equipment manufactured in other countries (Fig. 4).

Research necessary for the successful operation of these companies is conducted in-house. It is noteworthy that a market-based organisation model is unlikely for most research, as working for one or two customers requires specific investments for which incentives are very few in the existing model of market organisation. In turn, rights for developments produced in-house or commissioned by the companies themselves are efficiently protected by means of corporate policy. This is why the largest companies in Russia for the most part remain, at minimum, neutral to issues of RIA rights protection.

This is confirmed by Rosstat surveys that identify financial and economic risks as the principal barriers to innovation, with far fewer companies concerned by protection of intellectual property rights and innovation infrastructure (30%) (Fig. 5).

The qualification that companies are neutral at minimum is not accidental. In fact, with respect to research that could be produced by both in-house and independent developers, large vertically integrated companies are strategically interested in relaxing the property rights protection regime. In this case, Russia is no exception: it is well-known that, for example, in the global information and computer technologies sector, companies that came to dominate the market at a given time were generally in favour of slackening legal protection of RIA [Barnett, 2012]. The desired extent of patent protection depends on the size of the company and its vertical organisation model. For example, in the information technology sector, companies such as Microsoft and IBM have a wealth of opportunities for non-patent protection of their developments. While strong patent protection guarantees revenues from developments for smaller firms, it also forces larger companies to incur sizeable license purchase costs for the technologies they need or to give up production altogether. To protect themselves from such a predicament, large companies create lobbying groups for promoting their interests through legislation. Examples include the Information Technology Industry Council, which brings together companies such as Accenture, Apple, Canon, Cisco, eBay, Dell, and Intel, and the Business Software Alliance Group established by Adobe, Intelligent Security Systems, McAfee, Cisco, Dell, Hewlett Packard, IBM, Intel, Microsoft, and SAP. In addition to membership of large associations, individual companies have their own lobbies. One example is BlackBerry, which, having paid USD 612 million in patent costs, doubled its lobbying team to exercise greater influence on the promotion of a law that introduced restrictions of patent issuance.[1]

Meanwhile, outsiders and new market players are, as a rule, interested in stronger legal protections. This is unsurprising: the availability of legal methods to protect RIA is absolutely essential for independent non-integrated companies to position themselves in the market. Unlike vertically integrated companies, independent RIA developers can only achieve returns on their investments when rights to the exclusive use of their developments are protected. However, at the moment, companies that can be considered independent developers make up a negligibly small share of the Russian economy. This is the reason for the low declared demand for protection of RIA in Russia.

The majority of RIA developers, beyond vertically integrated companies, are research institutions financed by the government.

Since the government finances the vast majority of these institutions, they cannot, strictly speaking, be regarded as independent players in the development market. Their sources of funding are not incentive-neutral. Government-sponsored research institutions will inevitably have more interest in further funding than RIA rights protection. One reason for this is

1 Blackberry lobbying on patents. Available at: http://www.clgcdc.com/blackberry-lobbying-on-patents

obvious – for such institutions, RIA rights are owned by the government. Affording institutions the right to dispose of part of their financial gains from RIA changes developers' incentives, but only to a small degree, (though in some cases this small degree might be enough), as these rights account for only a minor share of those potentially available to developers in the first place. Rather than being particular to Russia, such a development incentives structure is characteristic of any research sector where participants do not assume market risks (risks of demand for research results [Winkofsky et al., 1981; Baker et al., 1976]).

Moreover, in the current environment, strengthening the property rights of RIA developers may be fraught with undesirable consequences for public well-being. In this hypothetical case, RIA developers would have the right to part of the profit resulting from RIA use without assuming risk on the underlying developments. Meanwhile, the optimal amount of RIA production from the perspective of developers, as decision-makers, would be largely in excess of the optimal amount from the public perspective, resulting in over-production of RIA. Moreover, as the system has no negative incentives ("penalties") for developers related to development of unwanted RIA, this would simultaneously result in lower quality ("performance") of developments. Although this model may appear hypothetical, it describes the differences between the Russian R&D system and a "market-based" one. It is therefore not surprising that in taking a decision to initiate and finance developments under such a system, agents will be much more interested in an environment that enables them to obtain and increase funding of current operations than in an environment that allows them to protect rights to RIA for which market demand is low. The problem of protecting rights to RIA in a system where guaranteed centralised financing of innovation activities is prevalent appears to be itself quite different from its traditional formulation, which is based on risks assumed by the entrepreneur. The centralised system, a legacy of the planned economy that has remained intact to this day as the principal means of maintaining the human capital capable of producing developments, generally performs worse in an environment where RIA rights are protected. This does not mean that the system – including a centralised economy – does not produce players that are interested in protection of rights. All research institutions (almost without exception) have numerous stories where certain groups of developers (or individual researchers) that produced results with promising applications aimed to split off and use them elsewhere. In fact, this is the story behind almost all independent companies that offer their developments to the domestic market. Rather than questioning to what extent the commercial success of developments is underpinned by the R&D history of their parent institutions, a few examples should be reviewed. The first is a team of six young researchers from Perm who created a high-technology company, manufacturing oil field equipment with pump parts produced using the metal powder method. Now this company (Novomet) has a turnover in excess of USD 200 million and ranks among Russia's three largest producers of oil field equipment[2]. A similar approach was adopted by researchers who established Semiconductor Devices, a private company, at the early stage of the reforms. Leaving academia, they initially financed their research with loans, entering into large-scale contracts some time later.[3] Another high-technology business was created within the Saint-Petersburg State University, where a group of genetics scientists established a laboratory of their own that has since grown into a cutting-edge production facility for the synthesis of rare proteins in high demand by both domestic and international markets.[4]

In all of these cases, groups of developers split from their parent institutions, as this was the only way to protect their right to revenues from the use of their developments. It is easy to see how in this situation the protection of RIA rights is essentially analogous to the right of profit-making divisions of a company to break away from loss-making divisions. Moreover, this perception is well founded: the isolation of successful developments from the system as a whole will undermine the performance of the entire system. In this context, the problem of protecting RIA rights from unauthorised use appears to be a problem of protecting them from individual developers. In turn, individual developers have traditionally protected their rights using a wide range of auxiliary instruments, vertical integration being the main one. In other words, the vast majority of developers offer RIA-related services rather than RIA itself on the market.

The assertion of low declared demand for the protection of RIA rights requires specification. Rather than any protections applicable to RIA, the present discussion deals only with those universally applicable by different market participants. As a matter of fact, in-house developments also have legal protection including, for example, trade secrets. However, while undoubtedly part of legal protection of RIA, trade secrets are not universally applicable since they are not available to companies that do not use RIA at downstream production stages.

On the other hand, it is a lack of demand for the types of RIA that would be produced by independent developers that creates a lack of demand for universal protections on the part of such potential developers, since this group does not have a sufficient weight in the Russian economy.

The current lack of demand for universally applicable protections does not mean that demand will not emerge in the near future. The logic of economic development and public policies, including innovation-encouraging policies, is aimed at creating a sector of independent RIA development. Even with a modest degree of success, innovation policies result in the emergence of new firms that can be regarded as independent developers. It should not come as a surprise, however, that in identifying focus sectors for developments, these firms also prefer those secors which guarantee a return, thus relying on traditional protection methods, primarily those bundling RIA transfer with

2 Oil Sector Turns to Powder, The Expert, 2006 http://expert.ru/expert/2009/08/neftyanka_saditsya_na_poroshok/

3 Ugly Ducklings, The Expert, 2002. http://m.expert.ru/expert/2002/07/07ex-nauka_41504/

4 Green Fingers for Bringing a Business, The Expert 2006, http://expert.ru/northwest/2006/31/vysokotehnologichniy_biznes/

rendering RIA-specific services. This is a normal manifestation of the "pre-development dependence effect."

One outcome of the Russian economy's sectoral structure and historical development is relatively low demand for stronger, universally applicable RIA protections. Moreover, retention of current peculiarities in the organisation of production, research and application of the research – including preservation of vertically integrated companies as principal market players, institutions and organisations financed by the government as key drivers behind the organisation of the R&D process – will create demand for weaker legal protection of property rights.

Developers in specific sectors and industries are likely to require better protection of RIA rights. Moreover, there is no guarantee that satisfying the demand for better protection of RIA rights will improve public well-being (as demonstrated in section 3 below; de-facto, better protection of producers of original drugs in Russian markets is unlikely to benefit either producers as a group or consumers in Russia). On this basis, one can conclude that policies for changing the legal protection regime in respect to RIA will only be effective and successful if:

- RIA protections are considered comprehensively, and
- Focus is concentrated on the actual structure of sectors to be affected.

Figure 1

Russian manufacturing sector as a percentage of GDP: international comparisons.
Source: http://www.theglobaleconomy.com/compare-countries/

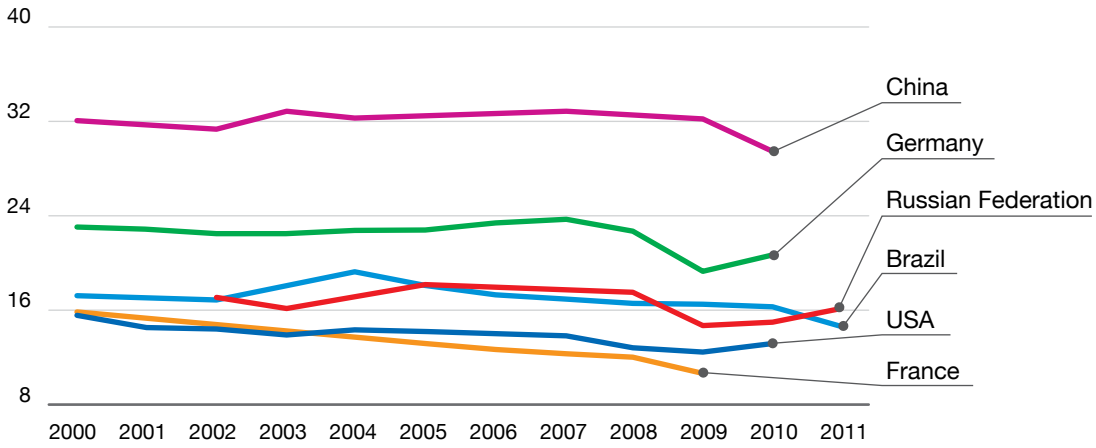
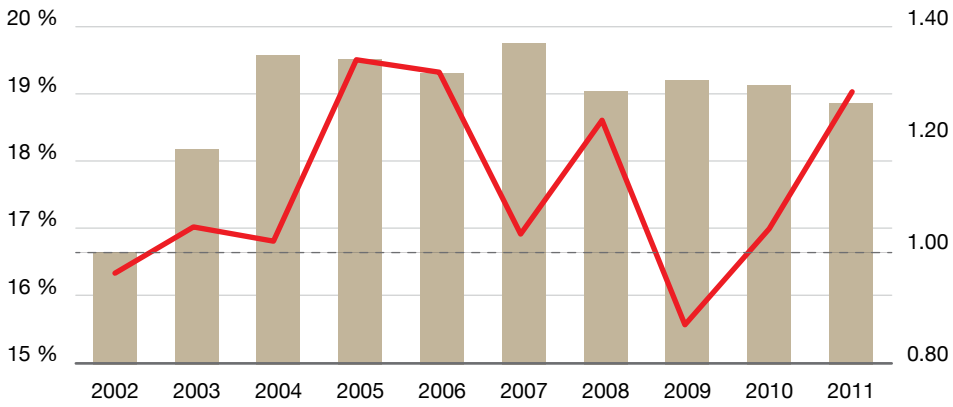


Figure 2

Oil, gas and oil derivatives as a percentage of GDP in Russia
Source: Drobyshevsky S. Russia Is Overcoming Its Dependence on Oil, Slon. Ru, 14/06/2012



Sources: Ministry of Economic Development, Rosstat, Development of RU HSE

Figure 3

R&D costs as a percentage of GDP
Source: Global Innovation Index 2012, WIPO, INSEAD

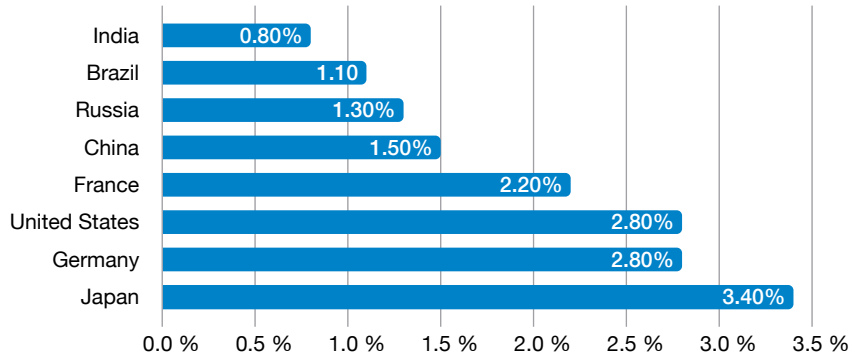


Figure 4

Expenditure on imported and domestic hardware as percentage of total investment in machines and equipment by manufacturing sector

Source: Golikova V.V. et al. (2007). The Russian Industry at the Crossroads. What Prevents Russian Firms from Becoming Competitive. M. SU-HSE

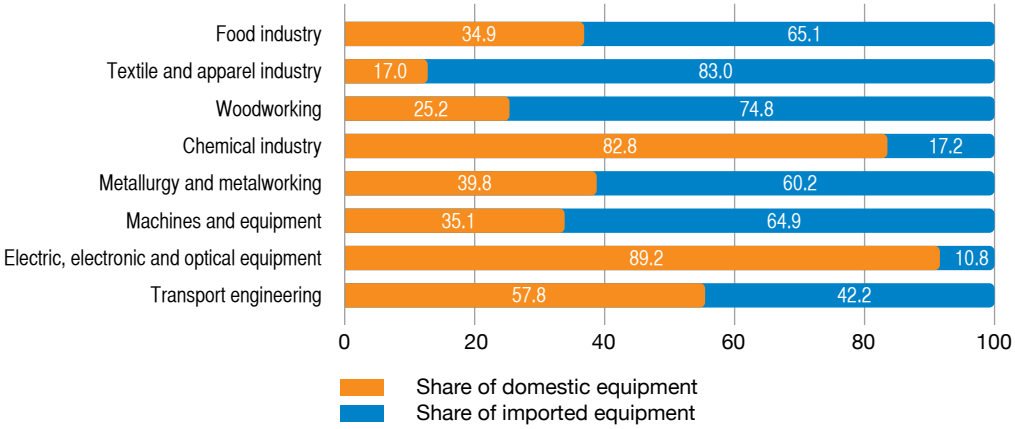
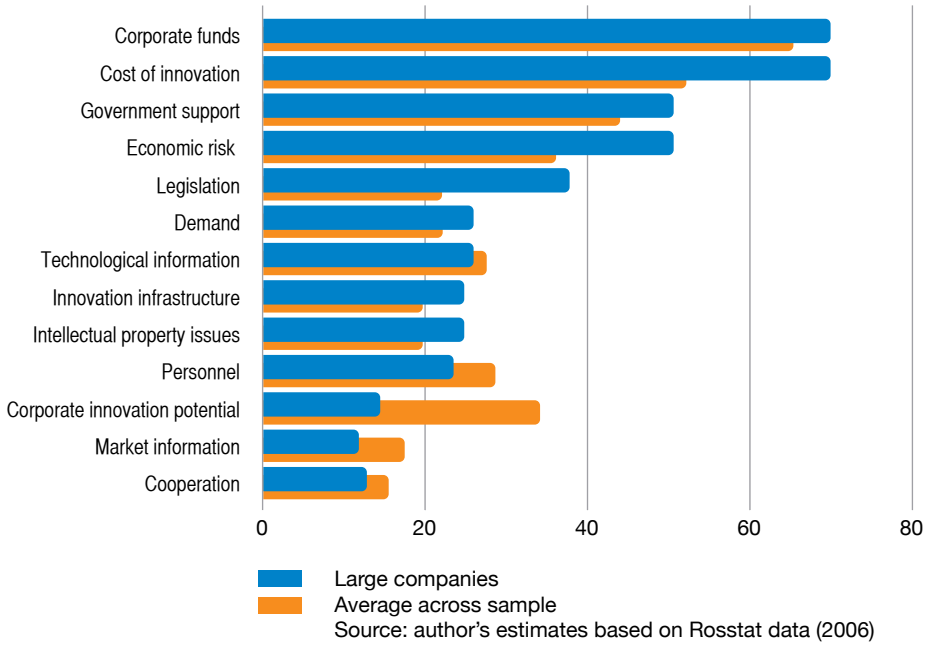


Figure 5

Perception of factors preventing innovation (percent of respondents answering “important” or “decisive” from large companies – those employing more than 10,000 workers – compared to the sample average).

Source: Gonchar K. R. Innovation Behavior of Super Large Companies: Lazy Monopolies or Modernization Agents? – 2009. SU HSE, pre-print WP1/2009/02, series “Institutional Problems of the Russian Economy.”

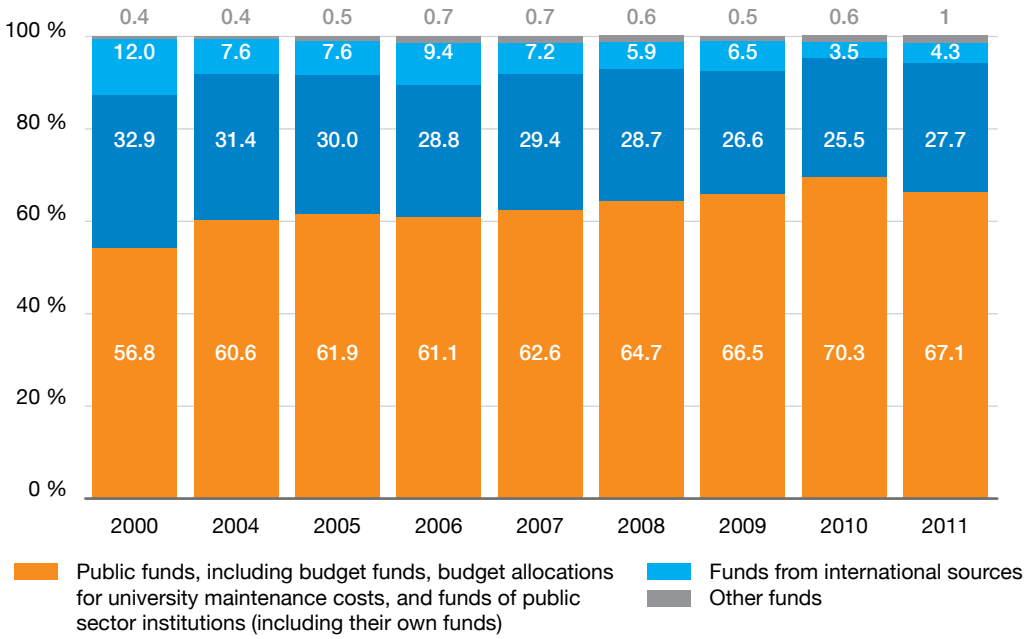


Source: author’s estimates based on Rosstat data (2006)

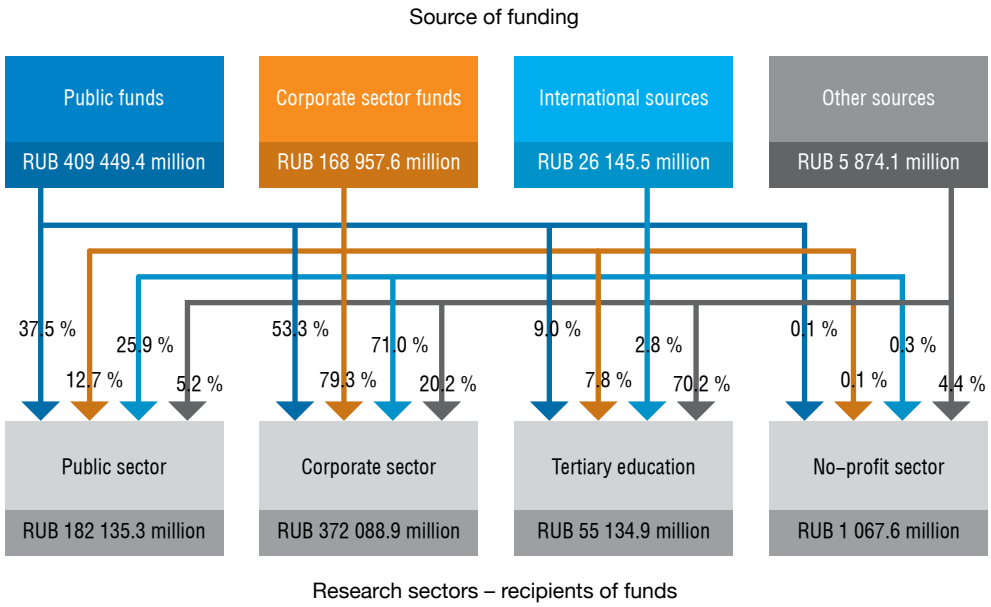
Figure 6

R&D funding structure and organization in Russia.
Source: Indicators of Science 2013. Edited by Gokhberg L.M., Kuzminov Y.I., Laikama K.E., Fedyukin I.I., M., RU HSE, 2013 http://www.hse.ru/primarydata/in2013

Breakdown of internal R&D costs by source of funding



Breakdown of R&D funding by research sectors (2011)



1.2 The Principal Arguments for the Analysis of Intellectual Property Rights Protection Policies in Russia

1. There is no hard and fast empirical or theoretical evidence of a positive effect of a strict intellectual property (IP) rights protection regime on the economic and social development of countries. As was demonstrated in the previous section, the effects of RIA rights protection are largely sector and country specific.

2. In international literature, studies of the range of problems associated with intellectual property are normally related to a separation between "developed" and "developing" economies. While for the former the intellectual property protection regime is viewed primarily from the perspective of incentivising intellectual activities and putting their results to commercial use, for the latter the importance of intellectual property rights is seen from the perspective of attracting foreign direct investments and gaining access to foreign technologies. Moreover, while there is some evidence (albeit not straightforward, see the previous section) of a positive effect of RIA rights protection on foreign direct investments, a positive effect on access to technologies and imports of high-technology products is not proved in principle.

Therefore, identifying options for the protection of intellectual property rights that would be optimal for Russia is largely related to whether the country is associated with a particular type of economy. As will be demonstrated below, for the purpose of analysing intellectual property protection regimes, Russia is a "mixed" economy with relatively high potential in specific sectors. Therefore, the need for protection of intellectual property rights of domestic producers is paralleled by a considerable number of sectors, that are recipients of intellectual property assets produced elsewhere. Therefore, we cannot make a straightforward assertion that Russia will be better off with a RIA rights protection regime applicable in developed economies or that Russia should opt for weaker protection of RIA rights, which might be more effective in developing countries.

A confirmation of the "mixed" nature of the Russian economy can be obtained from official statistics. On the one hand, Russia ranks third (behind only the United States and Japan) in terms of the number of people engaged in scientific research: 846 thousand (1.4 million in the United States and 878 thousand in Japan).[5] However, Russia accounts for just 0.5% of the world market for knowledge-intensive products, while exports of knowledge-intensive products account for only 2.3% of the GDP (compared to 32.9% in the United States and 32.8% in China), with legally protected developments accounting for less than 10%, of which only 2.2% were put to commercial use.[6] In 2011, a total of 31,433 patent applications were submitted in Russia as compared, for example, to 435,608 in China, 432,289 in the United States. It is noteworthy that the number of patent applications submitted in Russia was in excess of those submitted in Brazil (4,212) and India (15,717)[7], countries traditionally regarded as developing economies where stronger protection of intellectual property rights does not appear to be critically important but which demonstrate strong rates of economic growth, including in high-technology sectors of the economy.

3. As demonstrated by international studies, although institutions for the protection of intellectual property rights are important, their role in the country's overall economic development should not be overestimated. Judged on their own merits, institutions for the protection of intellectual property rights are not "drivers" of economic development: as was demonstrated in the previous section, there are examples of both successful countries with "poor" institutions for protection of RIA rights and countries with "sound" institutions which do not contribute sizeably to economic development. That is, generally speaking, institutions for the protection of intellectual property rights are useful, but neither necessary nor sufficient for encouraging development in general and innovation-based development in particular.

4. Protection of intellectual property rights does not boil down exclusively to universally applicable legal methods. In reviewing sector-specific protection mechanisms and problems to be addressed (see the next section), at minimum the following types of protection can be discerned:

I. Methods that are not based on legal mechanisms in protecting the rights to results of intellectual activity and means of individualisation (RIAMI):

- Measures of a technical nature (such as the use of unique non-reproducible technologies or technical solutions in mechanical engineering);
- Measures of an organisational nature (such as restricting the number of official distributors of products, including through the exclusive use of subsidiaries);
- Policies to bundle RIA to related services or products (that is, rather than selling RIA as such, offering services to de-

5 Global Competitiveness Report 2012. World Economic Forum, 2012.

6 The first meeting of the Intellectual Property Board under the Chairman of the Federation Council // Intellectual property. Industrial Property, No. 6, 2012

7 http://www.wipo.int/ipstats/en/statistics/country_profile/

velop and introduce the technologies created on their basis);

II. Specific methods of protection based on legal mechanisms not related to intellectual property law:

- Special forms of contractual relationships between companies (for example, inclusion of various restrictions into provisions of RIAMI supply agreements);

- Public regulation policies not directly related to regulation of intellectual property rights (for example, regulating access to the medicines market based on registration procedure, sectoral technical regulation). Specific legal mechanisms of public regulation can be formally provided both within the sectoral law and sectoral branch of the general economic law, for example, customs and tariff regulation, tax regulation, anti-trust regulation.

III. Methods using mechanisms for the protection of RIAMI rights specifically created for this purpose (for example, patent law).

In order to understand the current state of affairs regarding RIAMI rights protection in specific sectors and to develop proposals for improvement, it is necessary to review all of the above mechanisms and not only specific legal regulation as such.

Based on the above, in this chapter only the overall context and general analytical structure of studies conducted on the problem of efficiency of RIA rights protection mechanisms will be reviewed, with the assumption that it is impossible and incorrect to conduct an analysis of this institution in general. From a perspective of both analysis and recommendations to be developed, the only reasonable way to proceed is to analyse specific sectors and activity areas.

1.3 Narrowing the Subject of Study: Problems of Economic and Legal Interpretation

In accordance with the Civil Code of the Russian Federation (Civil Code of Russia), the results of intellectual activities and equivalent means of individualisation (RIAMI) are covered by specific intellectual rights (Article 1226) that are specifically made separate from property rights. Under Russian law, property rights are treated as corporeal rights governing tangible assets. Therefore, the concept of property rights applies to physical media (Article 1227) rather than RIAMI themselves. This understanding of proprietary rights to development results could itself be regarded as a factor complicating fruitful discussion of the economic nature of RIA rights associated with the production and use of RIA incentives and effects. In particular, this legal definition is considerably in conflict with the economic understanding of property rights, which simultaneously provides (whatever classification of the property rights set is used) both the possibility to control the use of developments themselves and the possibility to generate a return from their use.

One of the problems associated with discussions of results of intellectual activities (or results of developments) and means of individualisation (including trademarks and logos) is that economic theory brings us to a totally different conclusion with regard to the socially optimal length of protection of RIAMI.

With regard to the results of developments, the socially optimal option ensuring that consumers are better off is temporary monopoly power for the inventor, designed to strike a compromise between incentives for developments and the possibility of their use by an unlimited number of companies. In formal terms, this compromise is reflected in the logic of the Nordhaus model [Nordhaus, 1969]. It is this logic that justifies the time-bound effect of a patent. However, it is worth noting that only the patent ensures the inventor time-bound monopoly power to results of a development. Developments created within the hierarchical structure of an organisation can be protected for an unlimited time by virtue of the regime of their use itself. Actually, in this case the rights of inventors to returns from a development are time-bound only by competition in the market for end products created on the basis of the development.

As regards trademarks, economic theory provides for an indefinite protection period. Time-bound protection would assume that a trademark developed by one company would be put at the disposal of another company free of charge at a given moment. The difference of this event from the start of free use of development results is quite obvious. The expiry of the effective term of a patent assumes that any company may manufacture its own product based on a specific development and offer it to buyers. For example, a competing pharmaceutical company can market its own drug based on development results produced by a major global company (a generic drug in contrast to the original). Meanwhile, a scenario of “expiry of the rights to a trademark” would assume that a competitor could simply sell its products under the brand name of a global

pharmaceutical company. Obviously, the first scenario brings gains to consumers while the second scenario assumes no gains at all. Development results differ from a brand name in that, from the copyright holder's perspective, the former is the result of activities while the latter is the result of assessment of the specific company's product by consumers. From an economic perspective, the rights to use a brand name can be (partially) "transferred" without damage to consumers only when the brand name is used under the owner's control. For example, an authorised car dealer will obtain the rights to use the respective brand name provided that he operates according to business standards that meet the requirements of the brand owner. The control of service provisions and business operation standards by the brand owner will guarantee that operations of the dealer live up to expectations of buyers who favour the relevant brand name. A blind transfer (free use) of the brand name would make no economic sense and would practically result in a total depreciation of the brand name, since the relevant brand name would no longer be associated in the buyer's mind with the characteristics of the goods to be supplied.

The above remarks do not mean that the rights to development results and the rights to a trademark have nothing in common from the economic perspective. In theoretical terms, both of these cases are about property rights that are in a position to be protected. In neither of these cases will economic theory assume "unlimited" rights to be the socially optimal option. However, it is worth noting that the limits ascribed to these rights by economic theory will differ by virtue of differences embedded in objects. With regard to property rights to development results, economics suggests that it is desirable to limit the inventor's rights in time (for example, by limiting the effective term of a patent). Regarding property rights and means of identification, one could suggest that it is desirable to limit the rights to commercial use of a product after its first sale (for example, that it is undesirable for the seller to regulate the minimum resale price or prohibit parallel import). Straightforward conclusions and recommendations might be difficult to make because in some cases the development is part of the product, and specific legal provisions (or waivers thereof) can protect the rights of both inventors and brand owners. In spite of this, in discussing the implications of strengthening or slackening the rights protection regime, one should clearly bear in mind which rights – those of the inventor or those of the brand owner – are being dealt with. Bringing these rights into one category could make it considerably more difficult to offer conclusions and advice on specific problems of protecting the rights of RIAMI owners, since the conclusions and recommendations will inevitably split into two groups – the developments and means of identification.

Meanwhile, it is not without a good reason that the concept of "intellectual property" reflecting the proximity of meaning between physical property rights and RIAMI rights from an economic perspective has made its way into international and Russian economic literature, and into everyday use. As understood from a perspective of new institutional economic theory – one of the most influential schools of economic thought currently – property rights assume a set of institutions defining the holder of the right, object of the right, and set of powers at the holder's disposal with regard to the object [Shastitko, 2010, p.p. 158–165]. The types of powers are variously described in different legal and economic sources. For example, in accordance with the Civil Code of Russia, property rights include the rights of ownership, use, and disposal (Article 209, Civil Code of Russia). Alternative lists of powers associated with property rights include, in particular, those of Honore, Peyovich and Ostrom (see in details [Shastitko, 2010, p.p. 160–177]).

Intellectual rights will also assume a set of rights available to the owner (right holder) in respect to the subject matter of intellectual rights. Moreover, one could draw direct parallels between a number of powers attached to physical property rights and powers associated with intellectual rights. For example, as intellectual rights, the powers of use and disposal are equally applicable to RIAMI.

Therefore, the terms "intellectual rights" and "intellectual property rights" (IPR) will be used interchangeably. It is also worth noting that the term "results of intellectual activities and equivalent means of individualisation" (RIAMI) adopted in the Russian law is, firstly, quite rare from a perspective of international legal and economic literature, and, secondly, in accordance with the law will assume an exhaustive list of possible objects. In order to release further analysis from these constraints, we will deal with intellectual property objects (IP objects) rather than RIAMI while assuming that these two sets of objects are largely interrelated. In any case, possible differences between the sets of RIAMI and IP objects are not principally important in the context of this study.

Various types of IP rights also require different approaches to analysis and regulation. Classifications of IP rights are generally similar across different sources. Russian law actually identifies the copyright (and associated rights), patent rights (including specific categories of benefits), rights to trade secrets, and rights to the means of individualisation (brand names). In accordance with the classification adopted by the World Intellectual Property Organisation, IP rights could be decomposed into the industrial property rights and copyrights. Industrial property rights include rights to inventions (patent rights), trademarks, pre-production prototypes, and geographical names. Copyright implies the rights of creators of scientific developments and works of art – in a broad sense of this word – and associated rights. P. David includes patents, copyrights, and trade secrets into his analysis [David, 1993]; N. Kinsella includes patents, copyrights, trade secrets, and trademarks [Kinsella, 2008]. These classifications give a general idea of the range of rights to be considered as part of IP rights; in this section, we will focus more on patents and copyrights since they are directly related to innovation activity products.

The established system of intellectual property is actually only one of the discretionary alternatives regarding the organisation of commercial use of IP objects and support of innovation activities. For example, M. Carroll [Carroll, 2009] evaluates alternatives according to three criteria: (1) the possibility for works of art or inventions to be assessed by individuals and/or government; (2) comparative costs of administrative alternatives;

(3) political economy factors – assessing different alternatives from a political perspective. In analysing the system of IP rights as compared to other alternatives in light of these criteria, M. Carroll concludes that IP rights protection is more desirable, something which ensured its adoption and its "zero" option status. Meanwhile, a one-size-fits-all approach applying the same IP rights to all IP objects , thereby inflicting "conformity costs," is unjustified. Therefore, M. Carroll proposes fine-tuning the IP system depending on the specific situation and taking into account the criteria that he identified.

In the course of this study, we will focus on problems of intellectual property rights used in the process of generating innovations, that is, new value creation. In other words, less attention will be paid to issues related to the analysis of results of creative intellectual activities and works of art, and problems of trademarks that are not related to new value creation.

Based on the above, the subject matter of the study will include:

- Influence of legal provisions on incentives to invest in RIA to be used in the process of new value creation;
- Transaction management mechanisms related to results of research & development to be used in the process of new value creation, in particular, their dependence on the effective legal provisions.

1.4 Comparative Analysis of IP Rights Specification and Protection Methods; Analysis of the Market, Hybrid and Hierarchical Transaction Management Mechanisms for Transfer of IP Rights

It is necessary to identify a number of problems traditionally discussed when addressing the issue of preferable regimes for the protection of intellectual property rights.

1. RIA investment incentives depend on whether it is possible to receive royalties from the use of RIA. This is a standard problem of low RIA copying costs compared to considerable costs involved in their creation. This context gives rise to a typically institutional problem – what property rights (powers) should be protected in order to make it possible to maintain the market price and the length of time from RIA development to free copying, and what legal provisions support specific property rights. This problem is important because two options may be selected:

(a) Alternative instruments for protection of innovation income which depends on effective legal provisions, and

(b) Alternative transaction management instruments for RIA transfer. This gives rise to a typical situation: two alternative instruments equally satisfactory to RIA inventors will have a different effect on buyers, actual and potential competitors, and public well-being. Let us assume, for example, the following hypothetical situation. The rights of developers of a drug – in absence of potential suppliers willing to pay a price acceptable for the author of the development – are equally well protected by the trade secret regime and the patent. Neglecting for a moment that registration rules applicable to drugs require the disclosure of information on the development and testing of the drug, while the options of a patent and a trade secret have an equal *ex ante* value to the development's owner, they do not have an equal value to the society [Friedman, Landes, Posner, 1991]. The patent regime assumes that information on the development does exist, and, therefore, there is a possibility that a potential competitor capable of producing a new drug at a lower cost may emerge in the market and, therefore, propose to the developer an amount for the patent that will exceed the profit of the developer himself. The patent allows a Pareto improvement: thanks to information on the opportunity to use the development, either the developer, or the new seller, or buyers may have higher gains – possibly, all of them at once. This is the idea behind registration rules for drugs – while information on development becomes available to a wide range of interested parties, the developer's rights to revenues are protected for a long period of time. This system guarantees that buyers will start gaining from lower prices soon after the expiry of patent protection, as producers of substitute goods will prepare in advance to launch cheaper alternatives on the market. How-

ever, this logic works well for many patented developments. For society, patent protection requiring disclosure of information on the development's content is preferable to the trade secret regime.

The basis of developments intended for commercial use is the choice of an adequate transaction management mechanism for transfer of rights to their results. Worst-case scenario, the impossibility of choosing an adequate rights transfer mechanism will result in a decision to give up RIA development in principle. Choosing a deficient rights transfer mechanism will undermine the incentives for RIA development. However, choosing a transaction management mechanism in relation to RIA will also impact the process of RIA development. This is the traditional problem of choosing a transaction management mechanism: the hierarchy provides the best protection from potential opportunism characteristic of market transactions (the hierarchy will eliminate the hold-up problem), but the same hierarchy creates the basis for opportunism in the intra-corporate relationships system (primarily, in the form of shirking one's duties). This is taken to an extreme in the area of RIA development. A peculiarity of RIA is that, on the one hand, investments into RIA are highly specific, while, on the other hand, RIA is associated with strong development incentives for inventors (including intangible ones). The dilemma is that it makes no sense to invest in developments that may be subject to hold up. Under the hierarchical mechanism, the rights of developers are protected but another problem appears: since it is not possible to create in-house incentives as strong as those created under market transactions, and since almost any management mechanisms within a hierarchy will create negative incentives for risk-taking, and since under a hierarchy specific RIA developers will never have a reward which is adequate to the outcome (due to diversification of RIA investment within the hierarchy), the hierarchy will create sub-optimal incentives for RIA development at the personal level. This dilemma gives rise to alternative solutions where an attempt is made to maintain strong incentives while at the same time mitigating the problem of extortion. One option is purchasing a business (the controlling interest) with RIA rights provided, however, that the original owners of the business who managed the company will continue to perform the management function and hold a sizeable participation stake.

Is it possible to address this problem? For all RIA – no, for some RIA – yes. There is no way of solving the problem of excluding from the hierarchical mechanism those RIA, which are idiosyncratic – that is, when there is only one customer (the only possible value creation partner). However, it is possible to solve the problem if we deal with marketable RIA, which are not 100 percent specific. In this case, the choice to be made between alternative transaction management mechanisms will depend, among other things, on effective legal provisions. Let us take the sale of licensed IT products as an example. If the minimum price of "out-of-the-box" software is maintained, it will be marketed by independent dealers (using hybrid transaction management mechanisms – one example could be franchising terms established by 1C and other companies). Alternatively, the company's IT business will be organised to avoid using dealers. Once again, alternative decisions, to which the developer may be indifferent, will have a different impact on incentives.

In the next section, these issues will be discussed in relation to specific sectors. However, it is worth noting that the problem of choosing between transaction management mechanisms is important for both RIA development prospects and the prospects of changing the competitive environment. Moreover, it should be borne in mind that ousting hybrid transaction management mechanisms from business practices would result in the predominance of hierarchical mechanisms rather than development of market transactions. A desire to prohibit those contractual terms that appear to contradict the perfect market model may result in an opposite effect, with hybrid agreements between independent market participants being displaced by hierarchical coordination instruments. A prohibition or restricted use of universal legal instruments for protection of RIA rights will not affect those sectors where RIA are created and used within vertically integrated companies. But in the sectors where RIA could be transferred in the form of a limited user license or under bundled sales – RIA plus supporting services – actions that may appear pro-competitive at the first sight can bring about the opposite outcome.

In RIA markets, addressing immediate tasks of promoting competition means a focus on maintaining opportunities to use hybrid transaction management mechanisms, as the alternative is hierarchical mechanisms that will undermine the prospects of new participants entering the market.

1.5 Incentives, Costs and Benefits to Different Stakeholder Groups

The IP rights specification and protection regime will determine costs and benefits of the following stakeholder groups:

- RIA producers already in operation in the country's territory;
- Potential RIA resident producers in the country's territory;
- Potential RIA non-resident producers in the country's territory;
- Potential RIA resident producers in the territory of other countries;
- International RIA producers;
- RIA consumers in the country's territory;
- The government as a market player, presumably striving to achieve the maximum public well-being and to this end redistributing the well-being via the public budget.

Moreover, the above groups are also intrinsically heterogeneous: thus, RIA producers may include large businesses and small firms. In addition, the RIA production process, just as any other production process, can be regarded as a "value chain" where process participants may pursue different interests at different RIA creation stages.

Choosing a regulatory regime for each sector is a political choice that determines the balance of costs and benefits of all the above stakeholder groups.

On one hand, IP rights specification and the protection regime creates strong incentives for producers only of those RIA (RIA in those sectors) that are covered by an effective protection regime.

On the other hand, the impossibility of protecting specific RIA (RIA in specific sectors) results in a lack of RIA producers, and, therefore, a lack of demand for relevant regulatory institutions.

At the micro level, decision-making with regard to the availability and methods of IP rights transfer (RIA production method) is determined by the following factors:

- Extent of RIA specifics,
- Frequency of transactions to obtain the necessary amount of rights required for RIA use,
- Overall extent of uncertainty of the business environment in (general),
- RIA characteristics determining possible IP rights protection mechanisms, including specific sectoral legislative arrangements and their enforcement practices,
- Legislative regulation of specific legal mechanisms for protection of IP rights and their enforcement practices,
- Dependence of results of RIA use from subsequent efforts to be made by the transferor and transferee.

Some examples demonstrate how a change of rights protection mechanisms available to developers and of their effectiveness caused a change in the transaction management model down the production process chain stages. For instance, broadening patent rights applicable to RIA in the area of biotechnologies in 1982 and 1991 provided protection to research start-ups as they came in contact with major pharmaceutical companies that had a considerable advantage in the area of testing and promotion of relevant technologies, thus resulting in the separation of research and business functions and the growth of small research laboratories [Barnett, 2012].

It is worth stressing once again that a general review of costs and benefits of different groups in using different IP rights protection instruments (both legal and non-legal) appears to be a useless exercise if performed outside the specific sectoral context. The relevant analysis will be given in the respective sectoral sections. Meanwhile, the heterogeneity of groups that might be interested in stronger or weaker RIA protection poses the important problem of which stance will be better manifested in the process of public discussions. A universal law governs this: a more consolidated group consisting of more homogeneous participants will be more efficient in protecting its interests. This is a manifestation of a well-known problem of concerted action. In particular, it means that, where a large share of the market is occupied by major companies willing to adopt a standard which will increase their market power and prices, their chances of achieving the necessary legal changes will be much higher than those of buyers acting to prevent this adverse change. This regularity can be observed despite the fact that the change in the well-being of buyers will overweigh the change in the well-being of sellers in absolute terms: by virtue of the law of demand, the buyer will lose more from a price increase than the seller will gain. A consolidated group will normally win over a non-consolidated group in a political competition even if the latter exercises a larger amount of economic activity. One example of such change of well-being is the complicated registration system of drugs, reviewed in section 3 below. The Russian registration system redistributes

well-being from generic drug producers to original drug producers by delaying the entry of the former to the Russian market. This results in obvious losses for drug consumers. When the relevant provisions were being discussed and adopted, the party representing generic drugs was aware that the registration system would reduce its gains. However, since generic drug producers were less consolidated as a stakeholder group than original drug producers, while buyers (as a stakeholder group) were underrepresented in the decision-making process, the resulting decision was passed according to the law of concerted action.

Manifested and supported proposals to change the effective provisions reflecting the position of consolidated stakeholder groups are more likely to represent the position of a handful of large market players. As applied to the rights of RIA developers, this means that either proposals for excessive protection of RIA rights (production of medication drugs) or those for excessive slackening of protection of RIA rights will enjoy maximum support.

In assessing the implications of adopting a specific set of recommendations, it is necessary to take into account whose interests these recommendations will represent and how the interests of this group will fit into those of other groups that are the focus of economic policies – including the interests of end buyers and sellers, which are meant to be supported by state economic policy.

1.6 The Balance between RIAMI Rights Protection Policies and Other Aspects of Economic Policy

Intellectual property protection policy can be regarded, along with other policy areas, including industrial and competition policies, as one of the types of public policies to encourage innovation. As was already mentioned above, these areas may be mutually supportive (for example, when a strong protection of IP rights in combination with successful competition policies provides for high extra profits to be gained from innovations [Aghion, Howitt, Prantl, 2012]), mutually substituting (when, for example, active competition can provide incentives to innovate even in absence of IP rights protection [Jansen, 2009]), or even conflicting (if it is assumed that intellectual property is a monopolisation factor [Boldrin, Levine, 2008]). One reservation must be made, however – competition promotion policies and industrial policies have different goals, and, strictly speaking, they cannot be equated with innovation policies focused on creating and implementing innovations.

Developing the optimal combination of public policies will require consideration not only of theoretical and empirical models as part of a study of sectoral markets but also summarisation of public regulatory experience both by studying individual countries and performing empirical analysis of a sample of countries. A number of important papers were published in this area over the past few years.

The 2011 WIPO intellectual property report summary table of different areas of innovation policy is reproduced further in the text (Table 1) in an abbreviated form [WIPO, 2011, p.p. 82–85]. It is focused on policies designed to directly encourage innovations.

The WIPO identifies three principal types of instruments to encourage innovations: (1) policies that assume direct government funding and implementation; (2) policies that assume government funding and private business implementation; (3) policies designed to support developments to be financed and implemented by private businesses.

In their analysis of the above forms of innovation policies, WIPO experts point out different types of IP objects with which different policy options are associated. Undoubtedly, fundamental studies require direct involvement of the government since they are unlikely to find market sources of funds, whereas the support of IP rights and different forms of public-private partnership will be more focused on market signals.

WIPO experts also draw a distinction on the basis of the “pull” or “push” principles [WIPO, 2011, p.p. 82-85]. The “pull” principle is based on a market consideration, with the inventor to be rewarded only in case of successful implementation of his projects and marketing of results. As regards the “push” principle, the inventor will receive financial incentives in any event. Thus, the “pull” principle is more justified from a perspective of implementation of user demanded and marketable innovations. This principle provides the basis for the system of IP rights protection, public remuneration system, and (partially) the system of government contracts. The “push” principle is associated with a system in which innovations are directly produced by the government, with a system of subsidies, and (partially) a system of concessional loans and tax benefits. A lack of market-driven incentives appears to be less encouraging for entrepreneurs to innovate, but the “push” principle could be useful where successful marketing is doubtful, even with a positive result and where the area of innovation is as socially important as, for example, the pharmaceuticals industry.

Funding periods play an important role. As is justly noted by WIPO experts, instruments with ex ante funding may be useful in implementing large-scale, high-risk projects and where the financial system is underdeveloped and characterised by a deficit of "long money," as in Russia: this may require direct public funding, public budget subsidies, and concessional loans.

It is also important to make distinctions regarding the subject matter of decision-making. In the case of IP rights protection policies or tax benefit policies, the decision to innovate is made by firms on a decentralised basis, which theoretically increases the effectiveness of innovations because firms can be better informed of a specific market than government agencies. But decentralised decisions are not the best option for innovation across the board. Where a development provides for low private benefit but high social gains, a centralised decision may be well-founded. This works well for practically all developments designed to improve public well-being.

Undoubtedly, there are other factors in choosing innovation policy, in particular, the costs of policies to the state and the threat of subsequent monopolization, which was considered in greater detail above.

Following the lead of WIPO experts, it is important to indicate that different forms of innovation policy could turn out to be mutually substituting (in part), but their effectiveness will depend on the characteristics of the benefit and its legal parameters, and on peculiarities of the market.

For example, provision of tax benefits (including within free economic zones) could be regarded as a policy instrument substituting for stronger protection of RIA rights. In both of these cases, the support assumes decentralised decision-making at the company level regarding the choice of innovation objects and means of their implementation. In turn, the latter creates the threat of restricting competition and holding back the cumulative process of innovation. Also, in both cases companies will need to raise ex ante private funding for their projects while the reward can be expected only ex post, something that implies a risk for developers.

Meanwhile, in the case of tax benefits, a part of risks and costs will be assumed by the government (depending on the specific design of support policies) because fiscal concessions will apply to companies irrespective of whether innovations are successful or not – that is, a type of "push" support mechanism is partially implemented here.

Although the policy of establishing zones with special tax regimes might look like a rights protection policy according to a number of parameters, these two areas are generally mutually supportive, since tax benefits alone will not solve the problem of receiving income from innovations: income is only possible when IP rights are protected. One can argue that the IP rights protection policy is to some extent a substitution for a tax benefit policy in the sense that the latter will relieve the inventor of some risks and, therefore, will allow for higher risks regarding IP rights protection. In other words, where considerable market risks can undermine the success of innovations to be created, it is useful to apply a tax benefit regime to complement well-protected IP rights. Where innovations are likely to enjoy high demand, tax benefits will allow the implementation of innovations at a lower level of protection of RIA rights.

A combination of IP rights protection policies and special economic regimes regarding a possible preferential access to loans including government guarantees will produce a somewhat different effect. In this case, inventors will be relieved of risks even further since they will have access to *ex ante* funding, that is, incentives of the "push" type will become more manifest. Apart from a considerable reduction of risks, this will also reduce market-driven incentives, with a decentralised decision to innovate being largely replaced by an administrative decision, assuming that market signals are taken into account considerably less. But, again, concessional loans will not remove the problem of receiving income from innovations, and, thus, inventors will still require an adequate level of IP rights protection in order to ensure repayment of the loan and generate a return.

Therefore, the policy of providing special economic terms in the form of access to loans at lower rates is also mutually supportive of IP rights protection policies, though the reduction of risks by transferring them to the government allows for somewhat higher risks on IP rights protection to be assumed by inventors.

The issues of relationships between various government policies and IP rights protection will be discussed in more detail below when dealing with sectoral analysis.

To summarise, stronger/weaker RIA rights protection could be both substituted for and compensated by the use of other instruments of public economic policies. Just as issues of determining the level of protection, issues of substitution and support of RIA protection and other economic policy instruments are to be addressed in the context of specific sectors.

Table 1 Innovation policy instruments: WIPO classification

	Principal features	Funding	Innovations selected by	Innovation selection criteria	Principal advantages	Principal shortcomings
Funded and implemented by government						
Public research institutions	Public goods (defence, health care); no marketing required	Ex ante funding of project costs	Government	Public interest, opinion of community	Promoting fundamental science	Specific outcome is unclear
Academic studies	Fundamental science; no marketing required	Ex ante funding of project costs	Government, universities, benefactors	Public interest, opinion of community	Promoting fundamental science	Specific outcome is unclear
Funded by government, implemented by private firms						
Government contracts	Government purchases of specific innovation goods	Contract-dependent funding schedule	Government	Ex ante competition	Use of competition mechanisms for provision of public goods	Complications related to full contract drafting
Government subsidies	Government support of research for specific purpose	Ex ante funding based on expected costs	Government, companies	Competition, administrative decision	Use of competition mechanisms for provision of public goods	Poor awareness of project potential by government
Rewards (prizes)	Rewards for solution of specific problems	Ex post funding on the basis of cost information collected ex ante	Government	Competition	Use of competition mechanisms for provision of public goods, followed by simplified dissemination of innovations	Complications related to full contract drafting; private ex ante funding required
Concessional loans	Loans provided at lower rates plus government guarantees and flexible repayment schedule	Ex ante project funding	Government, companies	Administrative decision	Reducing risks of large-scale R&D projects	Asymmetric information on project outcomes; problem of profit for private firms not addressed
Tax benefits and other fiscal concessions	Lower profit (income) tax on R&D investment	Ex post funding based on actual costs	Companies	Evidence of R&D investment	Decentralized R&D solutions	Private ex ante funding required; problem of profit for private firms not addressed
Funded and implemented on a private basis						
IP rights	Exclusive access to the market	Ex post funding based on market evaluation of innovations	Companies	In accordance with the law on IP rights (patented innovations)	Decentralized R&D solutions	Private ex ante funding required; possible inefficient allocation of resources

Source: [WIPO, 2011, p. 85]

2. The Balance between RIAMI Protection and Competition Promoting Policies

The issue of correlation between RIAMI protection and competition promotion policies warrants special consideration in the Russian context.

As a result of provisions introduced to the Russian law to establish turnover-based fines for failure to comply with requirements of the anti-trust legislation (primarily articles 14.31 and 14.32, Code of Administrative Offenses of Russia), and after the first cases of multi-billion fines were reported (following the outcome of prosecution against the "big four"[8]), it became obvious that changes in the area of anti-trust law were of systemic importance for the Russian business community. The problem of striking a balance between anti-trust prohibitions and protection of rights to results of intellectual activities is a priority for the near future. A number of particular questions have emerged from the search for a solution to this problem, including the following:

- Balance of competition, innovations, and rights to results of intellectual activities;
- Possibility for abuse of the right to protection of competition and possibility for abuse of rights to results of intellectual activities;
- International context of striking a balance between protection of rights to results of intellectual activities and anti-trust provisions;
- Possibility of choice between different protection regimes applicable to rights to results of intellectual activities.

The problem of correlation between anti-trust provisions and protection of rights to results of intellectual activities has become especially urgent due to the start of procedures for developing proposals to make amendments to the Law on Protection of Competition and the Civil Code of Russia designed to change the established balance of anti-trust prohibitions and protection of rights to results of intellectual activities.[9]

8 In this case, we are dealing with large Russian oil companies that were repeatedly scrutinised by anti-trust agencies and subject to prosecution in the period of 2008 to 2011.

9 http://izvestia.ru/news/543396#ixzz2IsQYyPpW

2.1 Protection of Competition versus Intellectual Property Rights: Problem Statement

Antitrust law is a set of restraints aimed at protecting competition by applying exceptions to the freedom of contract principle secured by article 421 of the Civil Code of the Russian Federation and defined in general terms in article 10 of the Civil Code. Explaining the impact of such restraints in terms of property right theory, one can say that antitrust restraints primarily combined under the Law "On Protection of Competition" presuppose partial dilution (weakening) of proprietary rights.[10] However, this does not imply that antitrust law inherently contradicts the idea of protecting the rights to RIAMI.

Many perceived contradictions featured in discussions on the correlation between competition and protection of rights to RIA and RIAMI result from confusion. First of all, the confusion starts from contraposing market power and competition with respect to RIA and the markets where RIA are used. The question whether a RIA developer should be granted *temporary* monopoly power (none of the universal legal mechanisms ensures a permanent monopoly of the developer) is confused with the question of what market structure using RIA ensures better incentives for innovation.

The consequences of this confusion are serious, all the more so because there is a fundamental difference between the answers to these two questions. As far as the rights to RIA are concerned, the optimal solution from a public perspective is granting temporary monopoly power to developers.

Economic theory gives a different answer to the question of which market structure better ensures incentives for innovation. All other factors equal, competition on the commodity market creates conditions that ensure stronger incentives for innovation reducing costs or creating a new product. The conclusion is based on simple logic. Assume that a company receives after implementing an innovation. The incentives for innovation in this case can be measured by extra gains of the innovator, i.e. the difference between the profit levels before and after implementation of the innovation. The profit level after implementation does not depend on whether the company operated in this market prior to innovation in a competitive environment or as a monopolist. However, gains prior to innovation do depend on the market structure. Other things equal, a monopolist has higher profits and hence receives fewer extra gains as a result of innovation. Accordingly, other factors equal, he is prepared to spend less on innovation.

This phenomenon, known as substitution effect, was described by Kenneth Arrow over 50 years ago [Arrow, 1962] and until present is regarded as one of the most fundamental and essential elements within the framework of discussions on the effects of various protection regimes as well as the conditions and results of producing RIAMI.

A different situation arises in the field of protecting rights to the results of inventive developments. Protection of rights to RIA is an essential prerequisite of reproducing incentives for their creation.[11] Indeed, assuming there is free access for competitors to RIA of the above-mentioned company operating in a competitive market environment, economic profit will fall to zero practically immediately. It seems that in the given case public welfare may increase. However, assuming limited rationality and strategic planning capabilities on the part of the monopolist, the expectation of such a scenario on the part of a potential right holder can not only weaken the incentives for investing in innovation and, consequently, producing RIAMI, but also focus the incentives and attention (individually and organisationally) on those aspects of organising activities that are not related to using RIAMI and, consequently, unrelated to economic development. Actually, the costs associated with creating RIAMI could be regarded as constant values (relative to the output of goods produced using a given RIAMI). However, free access to RIAMI not involving even reimbursement of associated costs actually implies that innovation activities are punishable. In that case, one can achieve one-off gains based on a surprise effect. Predictably, this would reduce incentives for a given company to invest in RIAMI, but also, possibly, weaken incentives for companies operating both in a given industry and other industries. A recent paper by Acemoglu and Akcigit [Acemoglu, Akcigit, 2012] revealed signs of such effects in the field of software development. Following multi-year trials involving Microsoft, one could see a changing trend in the investment activity of both Microsoft and other software companies, though the latter must have received certain benefits ensuing from the judgments related to Microsoft.

Antitrust and RIA protection laws are aimed at achieving the same goals, though in itself RIA protection is antipodal both to restraining (diluting) IP rights and to antitrust arrangements serving as a means of limiting the right of market players to make decisions. Thus, maintaining competition in markets offers right holders more benefits from innovation than a mo-

10 See Shastitko, "On the economic theory of property rights", 2010.

11 It is quite possible that the incentives for creating RIAMI may not play a role of the decisive factor in those cases when (1) RIAMI themselves are an *incidental*, ex ante unpredictable result of actions aimed at achieving other goals, (2) the *process* has a separate value along with RIAMI.

nopoly environment, but the ability of a right holder to obtain these advantages primarily depends on the efficiency of RIA rights protection.

The considerations that, at first glance, disprove Arrow's conclusion are known as the efficiency effect [Tirole, 1999, v. II, pp.318-320]. If there is a threat that a competitor may enter a market where an established monopolist is already operating, the maximum amount of expenditure on innovation for the established monopolist will be higher than that of a novice player entering the market. The model assumes that in cases when the established seller carries out innovation he retains his monopoly (the novice decides not to enter the market). In cases when the novice player carries out exactly the same innovation, ensuring the same cost reduction or product improvements, he enters the market, but coexists with the established seller. Other things equal, the monopolist's level of profits is higher than or equal to the profits of two sellers in the same market no matter what type of strategic cooperation model they use. Assuming an innovative process, i.e. an innovation reducing manufacturer's costs, as costs are reduced, seller's profits increase. Accordingly, compared to a novice player, an established seller carrying out innovation receives a sort of "double" gain resulting from cost reduction and the advantages associated with retaining his monopoly status.

To what extent can the "efficiency effect" be regarded as an argument in favour of the assumption that the market structure characterised by the domination of an established seller is better for innovation? The answer to this question is it cannot, for at least two reasons. The first is associated with specific features of this theoretical model. Its key prerequisite is that a novice player has an opportunity for entering the market and the established seller undertakes innovation to prevent him from doing so. The possibility of a novice entering the market serves as the main incentive for innovation. If the novice intending to enter the market is absent or the costs of the market entry are prohibitively high, the incentives of an established seller in this model are equivalent to those of a monopolist in Arrow's model. Accordingly, measures restraining competition, such as limiting market entry opportunities for new players, by no means increases the incentives for innovation.

The second objection is based on the adequacy of the "efficiency effect" model in terms of its ability to define the observable market structure. If this model is regarded as the basis of a hypothesis for empirical analysis, the hypothesis could be roughly defined as follows: *"In a market where potential rivals exist alongside an established seller, innovation is always carried out by the established seller while the novice always abandons market entry"*. Needless to say that such a hypothesis is refutable.

As is known, there are at least several hundred research papers dedicated to the relationship between the competition intensity and incentives for innovation. Until now empirical studies have yielded mixed results [Dasgupta, Stiglitz, 1980; Kamien, Schwartz, 1982; Geroski, 1995; Teece, 1996; Ahn, 2002; Vives, 2008]. Some researchers revealed a positive dependence while others maintain that it is actually negative. Presently, the result obtained by Aghion et al. is considered classic – they arrived at the conclusion that the "dependence of innovation incentives on the competition intensity is described by an inverted U-shaped curve" [Aghion et al., 2005; Aghion et al., 2001; Blundell, Griffith, van Reenen, 1999]. Ignoring the fundamental problem of how one can measure innovation incentives and competition intensity, the fact that the results of empirical studies do not show a unique dependence is easily explainable. So far researchers have not found a reliable method to demarcate incentives from opportunities in empirical studies. Under the circumstances, even if sellers with a monopoly power in their markets have lower incentives for innovation, they simultaneously possess larger resources for innovation in imperfect financial markets.

Thus, according to economic theory, the following correlation between competition and monopoly power is considered optimal: in the field of RIA development, the balance between innovator's incentives and public welfare is ensured by granting temporary market power to the innovator. In the field of activities using RIA there are no serious arguments in favour of applying measures restraining competition as a means of increasing incentives for innovation. In other words, protection of innovators' temporary market power should be the priority of state policy towards economic entities developing innovations. With respect to economic agents who use innovation, priority should be given to the competition policy.

2.2 Do We Need Exceptions for RIAMI in Russian Antitrust Law?

One of the widely discussed issues within the framework of the third Antitrust Package (adopted at the end of 2011) and the fourth Antitrust Package[12] (the respective discussion actually started in February 2012 and continues until the present day) is whether to preserve or remove exceptions concerning RIAMI in the provisions of articles 10 (Part 4) and 11 (part 9) of the Law "On Protection of Competition." Should antitrust prohibitions apply to activities in the field of using the rights to the results of intellectual activity? Taking the above considerations into account, there is reason to believe that there is no simple answer to this question that can be used as a guideline, without clarification or adjustment, and not lead to serious problems.

With a *long-term perspective* a one-word yes/no answer is erroneous since it increases the risk of type I and type II errors. In the case of an affirmative answer, a lack of understanding of ways to apply such restraints will lead to an increased risk of type I errors: erroneous prohibition of those activities and agreements that have no relation whatsoever to restraining competition or whose existence is well justified.

A one-word negative answer to this question means either supporting the thesis claiming that the above-mentioned exceptions have no significance at all and actually fail to restrain anything (either the subject itself is absent or there are other norms allowing the resolution of hypothetical problems) or disregarding possible abuse of rights, including the rights to RIAMI as a means of restraining competition not associated with efficiency gains and hence not compensated by advantages for consumers.

Thus, if certain conditions associated with resolving topical issues in the field of property rights protection and antitrust law content/application are met, from a long-term perspective, one has good grounds to give an affirmative answer to the question above.

From a short-term perspective, one has more grounds to answer "no," which is primarily explained by:

1. The situation in the field of developing and implementing RIAMI protection laws;

2. General state of antitrust legislation in Russia;

3. Russia's place in the international system of economic exchanges related to the development and use of RIAMI, as well as transfer of associated rights (this is not limited to the issues of positioning Russia within the framework of the international system of labour division in the field of producing goods using RIAMI, but also such issues as patent registration, parallel imports and exhaustion of exclusive rights).

In this case, the question arises: how satisfactory is the approach to finding equilibrium between antitrust restraints and protection of RIAMI rights?

In a nutshell, the answer can be formulated as follows: the implemented approach is not ideal, in the sense that it does not require urgent (time-sensitive[13]) measures to remedy the situation. As a result, attention should be drawn to four interrelated aspects in the discussion on this problem:

Firstly, Russia fares poorly in international rankings of national IP rights protection. Specifically, according to the annual Report on Global Competitiveness prepared by the World Economic Forum, Russia ranked 125th out of 144 economies for intellectual property protection (this is just slightly better than its ranking for property protection on the whole – 133rd place) [World Economic Forum, 2012, pp. 388 – 389].

Secondly, the content of Russian antitrust legislation (including the provisions in articles 10 and 11 of the Law "On Protection of Competition") cannot be discussed in isolation from law enforcement practices. Otherwise, it is probable that policy mistakes stemming from the naïve institution importation theory will be repeated. Essentially, this theory can be reduced to the following: developed countries have well-reputed institutions; hence it is necessary to reveal and adopt the best foreign practices via making appropriate changes in the national legislation. At best such an idea leads to discussions on how these changes should be integrated into the existing legal system. By way of illustration, it seems relevant to recollect the logic characteristic of the supporters of the privatisation scheme chosen in Russia in the 1990s: even if initially the property rights to privatised assets turn out to belong to inefficient owners, eventually these assets will end up in the hands of efficient owners due to redistribution (exchange) of property rights.

However, as a rule little attention is given to creating the appropriate law enforcement infrastructure (or, speaking in more general terms, the transaction costs structure), one of the most essential characteristics of best practices, which, unlike legal rules, does not lend itself to simple copying. The complexities of copying are explained by the fact that it is much more dif-

12 The term used here originated as a result of certain inertia in the mechanism of public debates on changes in antitrust legislation.

13 By analogy with sensitive assets, time-sensitive actions ensure a larger net gain if they are carried out at a certain moment in time according to the principle "today is too early, and tomorrow is too late."

ficult to ascertain the state of affairs in law enforcement than to clarify the content of legal rules. One also has to reproduce the appropriate structure of incentives for the relevant interest groups, let alone such an essential element as a feedback mechanism between practice and rule making (in particular, the latter is important because rules are rarely perfect). By way of illustration one can refer to the assessment of conformance by economic analysis practices used for the purpose of the Russian Antitrust Law application to the established standards which, in their turn, have been largely borrowed from the US and European practices *[Avdasheva, Shastitko, 2011; Avdasheva, Shastitko, Dubinicheva, 2011].*

Thirdly, due to the increasing significance of antitrust legal instruments in recent years, risks and, in some cases, dangerous tendencies in the evolution of the Russian antitrust legislation have become more evident. First of all, this refers to creeping regulationism, dysfunctional norms, and serious underestimation of or disregard for economic aspects in antitrust cases. Creeping regulationism manifests itself in an overly restricted application of the concept of "comparable markets" as well as in the focus on accounting expenses rather than economic costs when applying the rules contained in Article 6 of the Law "On Protection of Competition". Dysfunctionality shows itself in applying the collective dominance provisions to cases of abuse by individual economic agents within collectively dominating entities *[Shastitko, 2011, 2012].*

Fourthly, here one should mention the methods for studying the direction of changes concerning (1) the development of and compliance with the standards of proof in antitrust cases and within the framework of control over economic concentration; (2) assessment of the impact of ex post facto application of laws using the available instruments of economic analysis; (3) development of norms with due account for anticipated effects (both in terms of efficiency and distribution) *[Kokorev, Shastitko (Eds.), 2006].*

Among other things, this issue concerns the argument in favour of abolishing exceptions stipulated in Articles 10 and 11: big foreign companies make use of the existing exceptions and take advantage of their status to the prejudice of Russian consumers. It may well be so, but:

1. There are other rules which, possibly, allow this problem to be resolved;

2. Probably, other explanations of the use of the above-mentioned practices are not taken into account, and their absence would only be harmful to consumers (according to O. Williamson, this constitutes an "inhospitable tradition" in antitrust legislation);

3. The aforementioned exceptions also concern Russian originators of RIAMI, and their abolishment would create additional antitrust risks for them along with prerequisites for increasing the cost of risk management.

The outlined considerations allow an answer to the following question to be approached: would an extension of antitrust restraints to the activities related to the use of RIAMI rights contradict the provisions contained in Part IV of the Civil Code of the Russian Federation, and does this approach conform to the obligations assumed by Russia at WTO accession?

Firstly, such risks exist to the extent commensurate with the probability of the abuse of rights to protection of competition both on the part of market players and on the part of government bodies (primarily those having the authority to apply antitrust laws). *Secondly*, there exists such a problem as substitution of protection of the interests of certain economic agents for protection of competition. In part, the presence of this problem was acknowledged in the third Antitrust Package by classifying the violations of Articles 10 and 11 into two groups, the second whereof contains the norms defining primarily exploitative but not exclusionary practices. *Thirdly*, expansion of economic regulation under the guise of applying classical antitrust instruments also poses a risk, which can be exemplified by The Law on Trade *[Avdasheva, Shastitko, 2012].* Fourthly, however, no systemic (or even fragmentary) assessment of such risks has been carried out which, in our view, deserves particular attention. Hence, at the moment all the decisions are taken blindfolded leading to one fairly predictable consequence – confirmation of the fact that unstable rules of the game are one of the criteria for the lack of rule of law (according to the structure of the aforementioned index) *[Agrast, Botero, Ponce, 2010*]. This is why it is essential to accumulate positive knowledge about the forms and scale of RIAMI rights abuse, on the one hand, and, on the other hand, to use antitrust laws to resolve economic disputes rather than protect competition, with the goal of preventing type I errors, when state intervention sometimes becomes an impediment to cooperation between market participants beneficial for social welfare.

2.3 The Protection of the Rights to RIAMI in an International Context

As far as Russia's WTO obligations are concerned, while answering the question of the balance between antitrust restraints and protection of RIAMI rights one should take into account that:

- Due to the diversity of RIAMI, there exist various means of protection specific to every type of RIAMI (e.g. parallel imports limitations protect the right of brand owners to derive income, but have practically no effect on the opportunities of patent owners and design holders for obtaining revenues);

- As far as is known, the WTO does not have uniform rules for protecting competition (similarly, there is no global antitrust policy), though such a possibility was discussed at earlier stages. One possible explanation for why the development of global competition rules has not been realised is set out in a paper by Avdasheva and Shastitko [2012].

Legal practices related to existing provisions in national legislation will have great significance. And this means that the established standards of revealing breaches of the current rules, structure of sanctions against pirates and scope of type I and II errors occurrence in law enforcement come to the foreground rather than definitions of norms containing restraints and reflecting the mechanisms of specifying and protection of RIAMI rights. In connection, the most important task is to guarantee RIAMI rights protection (primarily for RIAMI for the technical aspects of copying involve costs near zero) *[Shastitko, Kurdin, 2012; Shastitko, Kurdin, 2011].* This is explained by the fact that the insecurity of lawful right holders results in the dilution of rights, which, in turn, can be multiplied by extending antitrust restraints on RIA and, moreover, that can happen twice: (1) first by the mere fact of introducing restraints (type I error in law making); (2) erroneous finding of facts pointing to limitation on competition in a situation where the standards of proof are low and presumption of innocence does not actually work.

However, is it not true that jurisdictions with developed infrastructure for antitrust law enforcement and the protection of RIAMI rights apply antitrust restraints to actions and agreements related to the use of rights to these items? Yes, this is true. However, there is no question of unification in this sphere if, for example, we compare the US and EU. In the US priority is given to protecting the rights of right holders whereas EU approaches are characterised by giving priority to the protection of rights of access to RIAMI (including introduction of RIAMI not only indirectly, i.e. via producing goods/services, but also directly). At the same time, the relationships surrounding RIAMI are exactly the sphere in which problems concerning the correlation between the restraints imposed according to law and application of the balanced approach rule are most topical *[Kurdin, Komkova, 2012]*. In turn, the balanced approach rule places much higher demands on the mechanisms of legal norms application, specifically in terms of the level and scale of using the instruments of economic theory.

Attempting to streamline the types of situations where limitation of competition may occur in connection with using the rights to RIAMI and requiring the application of antitrust regulation instruments, one can summarise these as follows:

1. Patent agreements involving collusion (cross-licensing and patent pools, price-fixing);

2. Exclusive terms of transaction (exclusive licensing and exclusive dealing arrangements; provision on granting the licenser the exclusive rights to the invention of the licence holder in the field of use covered by the licence (*grant-back*); the impossibility of challenging the lawfulness of IP rights);

3. Transaction cancellation or creating obstacles to market entry (unilateral transaction cancellation, chargeback);

4. Standard-setting (patent ambush, extortion).

The above list shows the types of situations in which the signs of competition limitation may emerge, giving reasons for an intervention by the antitrust body based on established (country-specific) practices of antitrust law application in a certain country (US) or, possibly, a group of countries with a generally comparable business climate. To discuss the scope of the subject area and balance between antitrust laws and protection of RIAMI rights, a broader perspective may be required. We attempt to present such a perspective in the following section. Without creating an analogue to the Mendeleev periodic system in form of a serially ordered set of situations related to creation and use of RIAMI, this perspective allows to outline multiple aspects of both the RIAMI-common goods and RIAMI-RIAMI relationships.

2.4 Economic Theories on Antitrust Exemptions

If in using rights to RIAMI there are grounds for a wider application of the instruments of economic analysis, *inter alia* the necessities of a more intensive use of the balanced approach rule, can something definite be said about the views of economists on reaching a balance between antitrust restraints and protection of RIAMI rights?

There is an understanding among economic theorists that it is impossible for specific features of RIAMI not to have an impact on the characteristics of the antitrust exemption regime. As was noted before, this partly explains a broader application of the balanced approach rule to relationships involving the use of RIAMI. However, it is inappropriate to raise the question of what in economic theory constitutes a nuanced consensus on each of the various RIAMI and for all types of institutional environments. In part, this is explained by the fact that economic theory itself is a multitude of research programmes, which can find different, if not opposing, solutions to the same problems. Besides, testing of hypotheses requires data, and the latter sometimes prove to be fragmentary and biased, leading to contradictory research results and conclusions.

It should be recalled that the so-called substandard commercial practices in some cases have been interpreted by economists as a means of achieving the goals of monopolisation, while in other cases they spoke about the methods of saving on transactional costs and, respectively, increasing the efficiency of using limited resources [*Williamson, 1994, 1996, pp.61-70; Shastitko, 2007, pp.118-122*]. The latter constitutes an important prerequisite for improving welfare, including advantages for consumers. Is this not a criterion of achieving goal of antitrust policy?

When people refer to limitation of competition due to actions and agreements involving RIA rights, they often mean such use of RIA, which may lead to limitation of competition in markets for goods realised and produced in a way related to using the rights to RIA. Are there separate commodity markets associated with the realisation of rights to the results of intellectual activities? If RIA is regarded as an ordinary commodity (as is done in the US), one can raise the question of defining markets in antitrust terms. But as a result many other questions arise which have not been properly discussed and, moreover, have not even been defined as a prerequisite for positive research. For example, how are the product and geographical boundaries of the RIA market to be determined? What indicators should be used to assess the market size (if information accounts for a large part of RIA)? What significance does market share have in these markets, and does it have any relation to market power? What are specific features of market entry barriers, and what are adequate concepts describing, for example, the characteristics of network effects in such markets?

The questions raised suggest various relationships between RIA and ordinary commodities and, consequently, various opportunities for limiting competition in commodity markets, including those where RIA play the role of a commodity, as well as different links between markets. The study will now look at some of the most important elements of the area in question and respective research issues.

(1) RIA is an "ordinary" commodity

In this case the subject of analysis and decision-making is represented by situations where the right holder assigns either a part or all rights from the available set of rights (which can be presented in different variants proposed by Arthur Honore, Svetozar Pejovich, Elinor Ostrom and others) to another person, losing (retaining) the rights (part of the rights) to this set. Strictly speaking, different variants of economic organisation can be accommodated within the framework of this category of relationships, starting from an exclusive licence sale to licensing with a reservation, which provides for granting the licenser the exclusive rights to the invention of the licence holder in the field of use covered by the licence. In this case, there arises a standard set of questions about the status and behaviour of the economic agent in the market and accompanying effects, but with due regard to specific nature of RIA. In the first place, it concerns a market within product boundaries, since the applicability of the hypothetical monopolist test – both on the basis of statistical data analysis and sample surveys – apparently has considerably fewer perspectives here in comparison with markets for commodities produced using these RIA. Secondly, it concerns the composition of market participants and, in this connection, the question of not only product, but also geographic boundaries arise. Taking into account significant differences between separate types of RIA, one of the most important questions is whether there exist barriers to market entry and whether they are surmountable or not (both for legal producers and counterfeit manufacturers).

(2) RIA – the necessary prerequisite for producing ordinary commodities

This variant of relationship is important because it demonstrates that demand for RIA is derivative in nature, induced by demand for goods manufactured using the RIA. Patents essential for setting industry standards represent one possible case. In turn, compliance with these standards is a must for producing "ordinary" goods.

(3) RIA – an important, but not necessary condition for producing commodities

This means that a commodity (or a close substitute product) can be produced even without RIA with protected rights.

Moreover, it can be done in such a way that it does not necessarily lead to the loss of competitiveness by the producer of an "ordinary" commodity who is not employing this RIA (among other things due to saving on special investments and using simpler business models).

(4) One of the several competing RIA plays a role of a necessary prerequisite for producing ordinary commodities

This variant assumes that it is impossible to produce a competitive "ordinary" commodity without using one of the RIA. However, there exist various RIA, which can be used as substitutes for producing an ordinary commodity (close substitutes which can be combined within the framework of one market inside product boundaries). However, in this case one should also take into account that the existence of such an ex-ante opportunity for a separate market participant can be substantially limited ex post due to substantial switching costs.

(5) One of the several competing RIA – an important, but not necessary condition for producing an ordinary commodity

This variant actually reproduces the combined characteristics 3 and 4. However, in this case they concern the production of goods which are close substitutes forming a single market (first and foremost, within product boundaries). For example, this happens when along with a branded product there are similar goods having unprotected trade names partly due to the fact that the key characteristic of the product is linked to its generic name (e.g. baker's yeast, dairy butter, etc.).

(6) The RIA required to produce goods serves as a necessary prerequisite for creating other RIA which are employed to produce the same goods or new products (but with improved characteristics)

If RIA is a necessary prerequisite for innovation, in this case the discussion is about cumulative innovation. Unlike preceding variants, this one, by definition, deals with a dynamic aspect. Cumulative effects are manifested in those RIA, which can be developed only on the basis of access to the existing RIA (as well as in the RIA without which the development of new RIA is impossible). In connection with protection of the rights to RIA serving as a prerequisite for producing subsequent RIA, which, in turn, are needed to improve technologies for manufacturing of new products, the problem of overprotection of the original RIA rights may emerge. Another possible problem is related to the lack of sufficiently diverse mechanisms for transferring rights to the initial RIA. This set of issues is closely linked to various trajectories for developing and using multiple RIA time-interrelated in different ways.

(7) RIA can be used for producing an ordinary commodity only "in combination" with other RIA for production of ordinary goods

This variant occurs widely in the field of manufacturing technically sophisticated goods where one is required to simultaneously have the right to use RIA protected by several hundred patents. As distinct from item 6, the key feature here is complementarity in the production of goods. However, complementarity itself may not be strict in a sense that, for example, coupling two types of solutions may be required for a sophisticated technical device, but each of them, in turn, may have different variants. For example, one of two types of standards can be chosen for the production of a certain commodity which, in its turn, requires the use of other RIA.

(8) Differentiation of RIA protection regimen

This variant reflects multiple situations in which one commodity is a pre-condition for producing other commodities marketed at different levels of the technological chain as well as different variants of relationships between technological levels associated with the use of RIA (primarily patents) for rival companies.

In the first group of cases, each of the goods in their respective markets can be produced using RIA. Accordingly, one of the practical questions arising in connection is whether different degrees of patent protection are equal in terms of social welfare and economic growth rates. It should be noted that some studies suggest the existence of grounds for a differentiated protection regimen: stronger protection is required in upstream markets, but as they get closer to the end-user, protection may become weaker [Goh, Olivier, 2002].

The second group of cases is characterised by the presence of technological gaps between the competing companies. In this case, companies operating in the same market fall into two groups: leaders and followers. And there are several variants of forming regimes for protecting the rights to RIA. One can be termed universal and the other – differentiated. There is evidence suggesting that stronger protection of RIA rights for leaders is more preferable from the public point of view than universal weakening of the rights protection. In the first place, this is explained by the incentives trickle-down effect. In other words, incentives pass down to the closest pursuers who can increase investment, encouraged by the prospects of getting extra protection for RIA rights [Acemoglu, Akcigit, 2012].

Most likely, variants 3 to 5 do not presuppose application of any measures involving exemptions in the freedom of contract principle as a means of preventing monopolisation. In itself, variant 1 does not threaten competition in any way because regarding RIA as a commodity does not imply a monopoly. It should be underlined that what is meant here is the exclusiveness of rights which in economic terms are very indirectly associated with monopoly and can well exist under competition (competing RIA). From this point of view, adoption of antitrust restraints, especially taking into account the existing legal practices, can totally destroy or strongly distort the respective markets. Hence, antitrust interventions are deemed inexpedient unless additional circumstances are revealed (other variants of relationships).

What type of relationships associated with the above described various kinds of RIA are most widespread in different countries? Is there any similarity between these models and the system existing in Russia? In what way can differences affect the choice of the antitrust regulatory regimen (assum-

ing there is such a possibility)? The last question is especially topical in connection with the differentiation of the RIA rights protection regimen as a possible alternative. The costs associated with the implementation of this alternative pose one of the key problems.

2.5 Evaluation of the Russian Discussion on RIAMI Rights Protection Issues in the Antitrust Policy

Judging by the experience of the last two years, a blindfolded discussion on RIAMI rights protection and antitrust regulation is quite possible. Moreover, there is a rational explanation for it: (1) stakeholders have a narrow time horizon; (2) the necessary results of positive research (primarily, economic studies) into the problems of RIAMI development and their impact on competition are absent; (3) there are no incentives for increasing awareness about the importance of a well-informed choice of priorities (possibly, due to the fact that the subject actually rates very low on the agenda). Thus, one can always provide (1) policy proposals on the basis of plausible (but not verified) argumentation; and (2) ensure the presence of prohibitive costs while assessing grounds for decision-making within the framework of ex post evaluations.

Not all RIAMI protected by law are used to develop innovations (potential prerequisite for the type II errors) just as by no means are all antitrust restraints (as well as the mechanism for application thereof) actually aimed at protecting competition (type I errors). Does the possibility of RIA rights abuse exist? Yes, it does just as there are possibilities of abusing rights to subjects in other categories. When are there grounds to say that an abuse of rights actually took place? Are these abuses always associated with competition limitation? If not, then what cases of such an abuse can be regarded as a cause for application of antitrust restraints? Different approaches to finding the right balance are used in other countries. The US system is friendlier toward right holders whereas in EU preference is given to users. In itself, the absence of direct RIA rights exemptions in the American Antitrust Law and EU legislation is not a sufficient ground for taking the decision to remove such exemptions from the Russian Law "On Protection of Competition" under the pretext of harmonising the national antitrust legislation with European or American regulations. In part, the explanation of such a position can be found in the critical comments on the institutions importation theory. The main goal of efforts aimed at finding the right balance between antitrust restraints and RIAMI rights protection is to choose a policy variant that factors in the combination, scale, and structure of the existing problems as well as the full costs associated with the implementation of this policy.

To answer the question of the necessity of changing the approach to regulating the balance between antitrust restraints and protection of RIAMI rights, first one must answer a number of subquestions: (1) what are the possible alternatives in the field of RIAMI rights protection? what methods should be used for comparison, and what is the current comparison base for assessing the situation in the Russian antitrust regulation and making regulatory decisions?; (2) what is the current state of Russian antitrust legislation both in terms of regulatory content and regulatory practices vis-à-vis European and American antitrust systems?; (3) what solution has been found to the problem of balancing the instruments of protection and active competition policy? And, if another solution is required, how feasible is it under current conditions? Finally, it is of fundamental importance to understand the specific characteristics of the problem area (i.e. RIAMI protection and antitrust regulation) in Russia and its differences from the models which are regarded as sources for importing the rules and standards.

2.6 RIAMI Rights Protection in the Context of Russian Competition Policy: Primary Conclusions

From the perspective of economic theory, in the sphere of RIA development the balance between innovators' incentives and social welfare is maintained via granting temporary market power to the innovator. In the field of activities employing RIA there are no serious arguments in favour of limiting competition as a means of strengthening incentives for innovation. In other words, protection of innovators' temporary market power should be the priority of state policy toward economic agents developing innovations. As far as economic entities that use innovations are concerned, priority should be given to policies that promote competition.

The results of international comparisons do not offer unambiguous empirical and theoretical evidence of a positive impact of strict IP rights protection on economic and social development. As was shown in the previous section, the impact of IP rights protection has a marked industry-specific and country-specific character.

Taken separately, IP rights protection institutions do not serve as a locomotive for economic development: as was noted in the previous section, one can find examples of countries displaying successful economic growth on the background of "poor" institutions for IP property protection as well as lack of significant economic progress in the countries with "good" institutions. The institution of IP rights protection is useful, but it is neither necessary nor sufficient for boosting development in general and innovative development, in particular.

Strengthening/weakening protection of RIA rights can be both replaced and compensated by using other instruments of state economic policy. The issues related both to determining the level of protection as well as to substitution and supplementation of RIA protection system and other instruments of economic policy are resolved with due regard to specific features of a particular industry.

The expressed and supported proposals on changing active regulations reflecting the position of consolidated interest groups most likely represent the views of few large market participants. With respect to the rights of RIA developers, that means that the greatest support can be targeted either at proposals on excessive strengthening of RIA rights protection (production of pharmaceuticals) or those calling for excessive weakening of RIA rights protection.

Among other things, specific features in the history of Russia's economic development and sectoral structure of its economy led to a relatively low demand for legal methods of RIA protection which could be used universally. Strengthening of the current specific characteristics of industrial organisation as well development and use of innovations – particularly, preserving large vertically integrated companies in the capacity of major market players and state-financed institutions and organisations in the capacity of R&D managers – would create demand for weakening legal protection of property rights. However, the existence of such a demand does not mean that following it would allow raising public welfare.

In the Russian RIA markets, immediate objectives of promoting competition consist of retaining the opportunity to use hybrid mechanisms of transaction management, since the application of alternative hierarchical mechanisms worsens the prospects of market entry for new players.

The concept of intellectual property rights in Russian legislation in itself can be a factor complicating fruitful discussion of the economic nature of rights to RIA related to production and use of RIA incentives and effects.

Rights to RIA should not be confused with monopolism in antitrust terms even if they appear to be similar. One can put equality (but not identity) sign here only in certain specific situations where substitute products are absent and the patent really has a crucial significance for producing the commodity within the product boundaries. It is quite possible that a situation may emerge where competing patents are used to produce close substitutes, i.e. trade goods within the same product boundaries. It is also possible that holding a patent would allow the adoption of an innovation, which can result in reducing manufacturing costs and/or increasing demand for the company's product. Furthermore, these developments make up for the company's management deficiencies improving its competitiveness vis-à-vis a rival company which is more advanced in terms of management efficiency. Fourthly and finally, being a holder of a separate patent and possessing the respective exclusive rights does not guarantee an opportunity to implement an innovation since it may require another patent held by a rival of the first patent holder. The diversity of possible situations in the field of RIA rights transfer and protection of competition makes it important to pay more attention to the rule "one size doesn't fit all."

The current state of the Law "On Protection of Competition" and its practical application in Russia do not give reasons to conclude that withdrawing RIA exemptions from articles 10 and 11 would indeed allow resolving the existing problem. In the meantime, there are reasons to believe that withdrawal of the exemptions may have both predictable and unforeseen negative effects.

References

References

Acemoglu D., Akcigit U. Intellectual Property Rights Policy, Competition and Innovation // Journal of the European Economic Association. – 2012. – Vol. 10. – № 1. – P. 1-42.

Aghion P., Griffith R. Competition and Growth. Reconciling Theory and Evidence. — Cambridge, USA: MIT Press, 2005.

Aghion P., Bloom N., Blundell R., Griffith R., Howitt P. Competition and Innovation: An inverted-U relationship // Quarterly Journal of Economics. – 2005. – Vol. 120. – № 2. – P. 701-728.

Aghion P, Harris C., Howitt P., Vickers J. Competition, Imitation and Growth with Step-by-Step Innovation // Review of Economic Studies. – 2001. – Vol. 68. – № 3. – P. 467-492.

Aghion P., Howitt P., Prantl S. Patent Protection, Product Market Reforms and Innovative Investments. URL: http://www.development.wne.uw.edu.pl/uploads/Courses/aghion_ howitt_prantl_2012.pdf2012.

Aghion P., Howitt P., Prantl S. Revisiting the Relationship Between Competition, Patenting and Innovation. URL: http://www.development.wne.uw.edu.pl/uploads/Courses/aghion_howitt_ prantl_2012_2.pdf. 2011.

Agrast M. D, Botero J. C., Ponce A. WJP Rule of Law Index. Washington D. C.: The World Justice Project, 2010.

Ahn S. Competition, Innovation and Productivity Growth: a Review of Theory and Evidence. OECD Economics Department Working Papers, 2002, № 17.

Arrow K. Economic Welfare and the Allocation of Resources for Invention / The Rate and Direction of Inventive Activity: Economic and Social Factors / Universities-National Bureau (ed.). UMI, 1962. P. 609-626.

Auriol E., Biancini S., Paillacar R. Intellectual Property Rights Protection in Developing Countries. URL: www.etsg.org/ETSG2012/Programme/Papers/396.pdf. 2012.

Avdasheva S., Shastitko A Rules on Retailer- Supplier Relationships in the Competition Policy of the Russian Federation: How and Why Misunderstanding Economics Threatens the Competitiveness of the Sector // CPI Antitrust Chronicle, July 2012 (2).

Baker N. R., Souder W. E., Shumway C. R., Maher P. M., Rubenstein A. H. A Budget Allocation Model for Large Hierarchical R&D Organizations // Management Science, 1976, Vol. 23, № 1. P. 59-70.

Barnett J. Private and Public Supply of Intellectual Property Rights. Paper Presented at 16th Annual Conference of The International Society for New Institutional Economics, 2012.

Benhamou F., Farchy J. Droit d'auteur et copyright. P.: La Decouverte, 2009.

Bird R. Defending Intellectual Property Rights in the BRIC Economies // American Business Law Journal – 2006. – Vol. 43. – Issue 2. – P. 317-363.

Bitzer J., Schröder P. J. H. Open source software, competition and innovation // Industry and Innovation – 2007. – Vol. 14. – № 5. – P. 461-476.

Blundell R., Griffith R., Van Reenen J. Market Share, Market Value and Innovation in a Panel of British Manufacturing Firms // The Review of Economic Studies – 1999. – Vol. 66. – № 3. – P. 529-554.

Boldrin M., Levine D. Against Intellctual Monopoly. Cambridge University Press, 2008.

Boldrin M., Levine D. What's Intellectual Property Good for? URL: http://dklevine.com/archive/refs4786969000000000082.pdf. 2011.

Bruland K., Smith K. Knowledge Flows and Catching-Up Industrialization in the Nordic Countries: The Roles of Patent Systems / Odagiri H., Goto A., Sunami A., Nelson R. (eds.). Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y.: Oxford University Press, 2012. P. 63-94.

Carroll M. One Size Does Not Fit All: A Framework for Tailoring Intellectual Property Rights // Ohio State Law Journal – 2009. – Vol. 70. – № 6. – P. 1 361-1 434.

Casadesus-Masanell R., Ghemawat P. Dynamic Mixed Duopoly: A Model Motivated by Linux vs. Windows // Management Science – 2006. – Vol. 52. – № 7. – P. 1 072-1 084.

Chang H. F. Patent Scope, Antitrust Policy, and Cumulative Innovation // RAND Journal of Economics. – 1995. – Vol. 26. – Issue 1. – P. 34-57.

Correa C. Intellectual Property and Competition Law: Exploring Some Issues of Relevance / ICTSD Issue Paper. – 2007. – № 21.

Dasgupta P., Stiglitz J. Industrial Structure and the Nature of Innovative Activity, Economic Journal. – 1980. – Vol. 90. – № 358. – P. 266-293.

David P. Intellectual Property Institutions and the Panda's Thumb: Patents, Copyrights, and Trade Secrets in Economic Theory and History / Wallerstein M., Mogee M., Schoen R. (eds.). Global Dimensions of Intellectual Property Rights in Science and Technology. Washington D. C. : National Academy Press, 1993.

Dreyfuss R. The Role of India, China, Brazil and Other Emerging Economies in Establishing Access Norms for Intellectual Property and Intellectual Property Lawmaking / NYU School of Law Public Law & Legal Theory Research Paper Series.

Economides N., Katsamakas E. Linux vs. Windows: A Comparison of Application and Platform Innovation Incentives for Open Source and Proprietary Software Platforms / New York University Law and Economics Working Papers. – 2005. – № 32.

Economides N., Katsamakas E. Two-sided competition of proprietary vs. open source technology platforms and the implications for the software industry // Management Science. – 2006. – Vol. 52. – № 7. – P. 1 057-1 071.

Engelhardt S. v. Quality competition or quality cooperation? License-type and the strategic nature of open source vs. closed source business models / Jena Economic Research Papers, Friedrich-Schiller-University Jena and Max-Planck-Institute of Economics. 2010. № 2010-034.

Engelhardt S. v., Maurer S. M. The new (commercial) open source: Does it really improve social welfare? / Berkeley Goldman School of Public Policy Working Paper. – 2010. – № 10-001.

Etro F. Competition, Innovation and Antitrust. Berlin: Springer-Verlag, 2007.

Fan J., Gillan S., Yu X. Innovation or Imitation? The Role of Intellectual Property Rights Protections. URL: http://ihome.cuhk.edu.hk/~b109671/doc/research_woking_paper/11.pdf. 2010.

Friedman D. D., Landes W. M., Posner R. A. Some Economics of Trade Secret Law // Journal of Economic Perspectives. – 1991. – Vol. 5. – № 1. – P. 61-72.

Gallini N. Promoting Competition by Coordinating Prices: When Rivals Share Intellectual Property. URL: http://cis.ier.hit-u.ac.jp/Japanese/society/120412houtokeizai/Gallini.pdf. 2012.

Gallini N. Competition Policy, Patent Pools and Copyright Collectives // Review of Economic Research on Copyright Issues. – 2011. – Vol. 8. – № 2. – P. 3-34.

Gans J., Persson L. Entrepreneurial Commercialization Choices and the Interaction between IPR and Competition Policy / IFN Working Paper. – 2012. – № 895.

Ganslandt M., Maskus K. Intellectual Property Rights, Parallel Imports and Strategic Behavior // IFN Working Paper. 2007. № 704.

Ganslandt M., Maskus K. Parallel imports and the pricing of pharmaceutical products: evidence from the European Union // Journal of Health Economics. – 2005. – № 23. – P. 1 035-1 057.

Gaudeul A. Consumer welfare and market structure in a model of competition between open source and proprietary software / MPRA Paper. University Library of Munich, Germany. 2008. № 19555.

Generic Competition and Drug Prices. US Food and Drug Administration. URL: http://www.fda.gov/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDER/ucm129385.htm.

Geroski P. Market Structure, Corporate Performance and Innovative Activity, Oxford: Oxford University Press, 1995.

Gilbert R. Intellectual Property? A Review of Michele Boldrin and David Levine's Against Intellectual Monopoly // Journal of Economic Literature. – 2011. – Vol. 49. – № 2. – P. 421-432.

Goh A.-T., Olivier J. Optimal Patent Protection in a Two-Sector Economy // International Economic Review. – 2002. – Vol. 43. – Issue 4. – P. 1 191-1 214.

Goldberg P. Intellectual Property Rights Protection in Developing Countries: the Case of Pharmaceuticals / Alfred Marshall Lecture // Journal of the European Economic Association. – 2012. – Vol. 8. – № 2-3. – P. 326-353.

Grabowski H. G. and Vernon J. M. Brand loyalty, entry, and price competition in pharmaceuticals after the 1984 Drug Act, Journal of Law and Economics. – 1992. – Vol. 52. – № 35. – P. 31-50.

Hassan E., Yakib O., Diepeveen S. Intellectual Property and Developing Countries: A review of the literature. URL: www.rand.org/pubs/technical_reports/2010/RAND_TR804.pdf. 2010.

How Increased Competition from Generic Drugs Has Affected Prices and Returns in the Pharmaceutical Industry. Congressional Budget Office, July, 1, 1998. URL: http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/6xx/doc655/pharm.pdf.

Jansen J. Share to scare: technology sharing in the absence of intellectual property rights / Preprints of the Max Planck Institute for Research on Collective Goods. 2009. № 36.

Kamien M. I., Schwartz N. L. Market Structure and Innovation. Cambridge University Press, 1982.

Kinsella N. Against Intellectual Property. Auburn, Alabama: Ludwig von Mises Institute, 2008.

Kitch E. Elementary and persistent errors in the economic analysis of intellectual property // Vanderbilt Law Review. – 2000. – № 53. – P. 1 727-1 741.

Knox D., Richardson M. Trade policy and parallel imports // European Journal of Political Economy. – 2002. – Vol. 19. – P. 133-151.

Lago R., Costa N. Antiretroviral manufacturers and the challenge of universal access to drugs through the Brazilian National STD/AIDS Program // Cadernos de Saúde Pública. – 2009. – Vol. 25. – № 10. – P. 2 273-2 284.

Lambardi G. Software innovation and the open source threat / NET Institute Working Paper, The Networks, Electronic Commerce, and Telecommunications (NET) Institute. – 2009. – № 9-15.

Landes W., Posner R. An Economic Analysis of Copyright Law // The Journal of Legal Studies. – 1989. – Vol. 50. – № 2. – P. 325-363.

Lerner J., Tirole J. Some Simple Economics of Open Source // The Journal of Industrial Economics. – 2002. – Vol. 50. – № 2. – P. 197-234.

Lerner J., Tirole J. The scope of open source licensing // Journal of Law, Economics and Organization. – 2005. – Vol. 21. – № 1. – P. 20-56.

Li C., Maskus K. The impact of parallel imports on investments in cost-reducing research and development // Journal of International Economics. – 2006. – № 68. – P. 443-445.

Li C., Robles J. Product innovation and parallel trade // International Journal of Industrial Organization. – 2007. – № 25. – P. 417-429.

Liebowitz S. Copying and indirect appropriability: Photocopying of journals // The Journal of Political Economy. – 1985. – Vol. 93. – № 5. – P. 945-957.

Llanes G., de Elejalde R. Industry equilibrium with open source and proprietary firms / Harvard Business School Working Papers. 2009. № 09-149.

Machlup F. An Economic Review of the Patent System / Study of the Subcommittee on Patents, Trademarks and Copyrights. № 15. Washington D. C. : Congressional Printing Office, 1958.

Maskus K., Chen Y. Vertical Price Control and Parallel Imports: Theory and Evidence // Review of International Economics. – 2004. – Vol. 12. – № 4. – P. 551-570.

Maskus K. E. Intellectual Property Rights in the Global Economy. Washington D. C. The Insitute for International Economics, 2000.

Matson M., Winn S. Intellectual Property and Market Power in the Seed Industry: The Shifting Foundation of Our Food System // URL: http://ssrn.com/abstract=2153098. 2012.

Maurer S. M., Scotchmer S. Open source software: the new intellectual property paradigm / T. Hendershott (ed.). Handbook of Economics and Information Systems. Elsevier, 2006. P. 285-319.

Mazzoleni R., Martins Costa Povoa L. Accumulation of Technological Capabilities abd Economic Development: Did Brazil's IPR Regime Matter? / Odagiri H., Goto A., Sunami A., Nelson R. (eds.). Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y. : Oxford University Press, 2012. P. 280-314.

Moschini J. Competition Issues in the Seed Industry and the Role of Intellectual Property // Choices. – 2010. – Vol. 25. – № 2. – P. 1-14.

Mowery D. IPR and US Economic Catch-Up / Odagiri H., Goto A., Sunami A., Nelson R. (eds.). Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y. : Oxford University Press, 2012. P. 31-62.

Mustonen M. Copyleft — the economics of linux and other open source software / Discussion Papers of the Department of Economics, University of Helsinki. 2001. № 493.

Mustonen M. Copyleft — the economics of linux and other open source software // Information Economics and Policy. – 2003. – Vol. 15. – № 1. – P. 997-121.

Nordhaus W. An Economic Theory of Technological Change // American Economic Review, Papers and Proceedings. – 1969. – № 51. – P. 18-28.

Odagiri H., Goto A., Sunami A. IPR and the Catch-Up Process in Japan / Odagiri H., Goto A., Sunami A., Nelson R. (eds.). Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y. : Oxford University Press, 2012. P. 95-129.

Odagiri H., Goto A., Sunami A., Nelson R. (eds.). Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y. : Oxford University Press, 2012.

Papadopoulos T. Copyright, Parallel Imports and National Welfare: The Australian Market for Sound Recordings // The Australian Economic Review. – 2007. – № 71. – P. 434-447.

Raff H., Schmitt N. Trade policy and parallel imports // Journal of International Economics. 2007. № 71. P. 434-447.

Reducing the price of HIV/AIDS treatment. AVERT (an international HIV and AIDS charity). URL: http://www.avert.org/generic.htm#ref7.

Reichman J. Intellectual Property in The Twenty-First Century: Will the Developing Countries Lead Or Follow? // Houston Law Review. – 2009. – Vol. 46. – № 4. – P. 1 115-1 185.

Saha A., Grabovsky H., Birnbaum H., Greenberg P. and Bizam O. Generic Competition in the US Pharmaceutical Industry // International Journal of the Economics of Business. – 2006. – Vol. 13. – № 1. – P. 15-38.

Saint-Paul G. Growth effects of nonproprietary innovation // Journal of the European Economic Association. – 2003. – Vol. 1. – № 2–3. – P. 429-439.

Sampat B. The Accumulation of Capabilities in Indian Pharmaceuticals and Software: The Roles that Patents Did (and Did Not) Play / Odagiri H., Goto A., Sunami A., Nelson R. (eds.). Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y.: Oxford University Press, 2012. P. 361-377.

Scheufen M. What Scientists Can Learn from the Penguin: Open Access and Open Source / Paper presented at the Annual Congress of SERCI in Bilbao. 2011.

Schmidtke R. Private provision of a complementary public good / CESifo Working Paper Series, CESifo Working Paper. – 2006. – № 1 756.

Scotchmer S. Openness, open source, and the veil of ignorance // American Economic Review. – 2010. – Vol. 100. – № 2. – P. 165-171.

Sen R. A strategic analysis of competition between open source and proprietary software // Journal of Management Information Systems. – 2007. – Vol. 24. – № 1. – P. 223-257.

Sen R., Subramaniam C., Nelson M. L. Determinants of the Choice of Open Source Software License // Journal of Management Information Systems. – 2008. – Vol. 25. – № 3. – P. 207-239.

Sepetis K., Cox A. Intellectual Property Rights Protection in China: Trends in Litigation and Economic Damages. URL: http://www.nera.com/extImage/PUB_IPR_Protection_China_0109_ final.pdf. 2009.

Shastitko A. Collective Dominance Through the Lens of Comparative Antitrust // Antitrust Chronicle. Summer 2011, Vol. 8, № 2. URL: https://www.competitionpolicyinternational.com/collective-dominance-through-the-lens-of-comparative-antitrust.

Shastitko A., Kurdin A. Intellectual Property Rights Protection Versus Antitrust: Tug of War? // CPI Antitrust Chronicle. – 2011. – Vol. 12. – № 1.

Shavell S., van Ypersele T. Rewards Versus Intellectual Property Rights // Journal of Law and Economics. 2001. Vol. 44.

Snyder N. Intellectual Property Rights and China: A Survey of Adjudicated Trademark Dispute Cases from Guangdong Province // Washington Undergraduate Law Review. – 2010. – Vol. 3. – Issue 3. – P. 82-107.

Stiglitz J. Economic Foundations of Intellectual Property Rights // Duke Law Journal. – 2008. – Vol. 57. – P. 1 693-1 724.

Szymanski S., Valetti T., Demange G. Parallel Trade, Price Discrimination, Investment and Price Caps // Economic Policy. – 2005. – Vol. 20. – № 44. – P. 705-749.

Tamai T., Torimitsu Y. Software Lifetime and it's Evolution Process over Generation. Software Maintenance, 1992, Proceeding Conference on. P. 63-69.

Teece D. J. Firm Organization, Industrial Structure, and Technological Innovation. Journal of Economic Behavior & Organization. – 1996. – Vol. 31. – № 2. – P. 193-224.

The 2010 EU Industrial R&D Investment Scoreboard. European Commission, JRC/DG RTD, 2011.

The Pharmaceutical Research and Manufacturers of America (PhRMA). URL: http://www.phrma.org/news-media/related-resources/key-industry-factsabout-phrma.

U. S. National Institutes of Health (NIH). ClinicalTrials.gov — a registry and results database of federally and privately supported clinical trials conducted in the United States and around the world. URL: www.clinicaltrials.gov.

UNCTAD. Competition policy and the exercise of intellectual property rights. 2008.

Valletti T., Szymanski S. Parallel Trade, International Exhaustion and Intellectual Property Rights: A Welfare Analysis // CERP Discussion Papers. – 2005. – № 5 022.

Varian H. R. Markets for Information Goods,1998. University of California, Berkley.

Verani S. Open source development in a differentiated duopoly, Economics Discussion / Working Papers, The University of Western Australia, Department of Economics. – 2006. – № 05-06.

Vives X. Innovation and Competitive Pressure. Journal of Industrial Economics. – 2008. – Vol. 56. – № 3. – P. 419-446.

Weber S. The Success of Open Source. Cambridge, MA and London, UK : Harvard University Press, 2004.

Wiggins S. and Maness R. (2004). Price competition in pharmaceuticals: The case of anti-infectives. Economic Inquiry. – 2004. – Vol. 42. – № 2. – P. 247-263.

Williams S. Free as in Freedom Richard Stallman's Crusade for Free Software. CreateSpace Independent Publishing Platform, 2002.

Winkofsky E. P., Baker N. R., Sweeney D. J. A decision process model of R&D resource allocation in hierarchical organizations. Journal of Management Science. – 1981. – Vol. 27. – № 3. – P. 268-283.

WIPO. World Intellectual Property Indicators 2012. World Intellectual Property Organization, 2012.

WIPO. World Intellectual Property Report 2011: The Changing Face of Innovation. — World Intellectual Property Organization, 2011. Working Paper, – 2009. – № 09-53.

World Economic Forum, The Global Competitiveness Report 2012-2013 / ed. K. Schwab. 2012.

Xue L., Liang Z. Relationships between IPR and Technology Catch-Up: Some Evidence from China / Odagiri H., Goto A., Sunami A., Nelson R. (eds.) Intellectual Property Rights, Development, and Catch-Up: an International Comparative Study. N. Y.: Oxford University Press, 2012. P. 317-360.

Avdasheva S B and Shastitko A E, 'International Antitrust Law: Requirements, Limitations and Lessons for the Customs Union' (2012) 9 Voprosy Ekonomiki 110-125

Avdasheva S B and Shastitko A E 'Economic Analysis in Cases of Violation of the Law "On Protection of Competion"' (2011) 2 Voprosy Ekonomiki 122-139

Avdasheva S B, Shastitko A E and Dubinicheva H B, Standards of Economic Analysis in Cases of Violation of Antitrust Laws in Russia (M: MAKS Press, 2011)

Azarov M S, 'Domain Names in the Structure of Civil and Information Law' (2010) 2 Information Law

Analytical Market Survey by DSM Group. Issue: Aug 2012 (data cover the period up to July 2012), available at http://www.dsm.ru/marketnews/1147_27.08.2012

Association of Clinical Research Organizations, 'Information-Analytical Bulletin №4, 2012' http://acto-russia.org/files/bulletin_4.pdf

Association of Clinical Research Organizations. Information-Analytical Bulletin №5, 2012. http://acto-russia.org/files/bulletin_5.pdf

Bently L and Sherman B, 'Intellectual Property Law: Copyright Law' translated into Russian by V.L. Volfson. (St.Petersburg: 2004) 111-112

Bliznets I A and Leontyev K B, Copyright Law and Neighbouring Rights (Авторское право и смежные права), I A Bliznets (ed), (Prospekt Publishers, 2011) GARANT Legal System

Glossary: "Free Software: Special Terminology". Park Media Consulting LLC, KORUS Consulting LLC and Mezon.RU, CJSC (SSI/Linuxcenter, 2008)

Civil Code of the Russian Federation

Civil Law V. 1: General Part, E A Sukhanov, Ed (Wolters Kluwer, 2008) GARANT Legal System

Dolgin A B, Economics of Symbolic Exchange (M: Infra-M, 2006)

Opinion of the Russian State Duma Committee on Economic Policy, Entrepreneurship and Tourism of 11 September 2006, N 3.8/16-924, on draft N 323423-4 of Part IV of the Civil Code of the Russian Federation

Informational Letter of the Presidium of the Supreme Arbitration Court of the Russian Federation of 14 July 1997, N 17 «Review of Practice in the Application of Article 333 of the Civil Code by Arbitration Courts»

Outcomes of Market Development in 2011 and Forecast for 2012. EMC Farmexpert (14 May 2012) http://www.pharmexpert.ru/analytics/4/2615/

Code of Administrative Offences of the Russian Federation

Kokorev R.A., Shastitko A.E. (Eds.). Using Evaluations of the Regulatory Impact for Improving Corporate Law (M: Teis, 2006)

Commentary to Article 1027 of the Civil Code, 'Commentaries on the Civil Code of the Russian Federation. Part II: Instructional and practical commentary' (Sergeev A.P., Ed.) Prospekt, 2010

Kurdin A A and Komkova A A, 'Characteristics of Antitrust Policy in the Field of Intellectual Property as Exemplified by the US and EU' (2012) 9 Laboratory of Competition and Competition Policy Problems

Review of the Russian Market of Branded Generics (EMC Farmexpert, 10 May 2011) http://www.pharmexpert.ru/analytics/6/2206/

Popov D. (2011) Checkup for Pharmaceutical Innovations. (Remedium, №5, 2011) http://www.remedium.ru/section/detail.php?ID=49781&from=sub&SHOWALL_1=1

Resolution of the Ninth Arbitration Court of Appeal of 18 July 2008, N 09AP-8013/2008

Resolution of the Federal Antimonopoly Service (FAS) of the Moscow District of 26 May 2010, N КГ-А40/4710-10

Resolution of the Plenum of the Supreme Court of the Russian Federation and Plenum of the Supreme Arbitration Court of 26 March 2009, N 5/29, 'On Certain Questions Arising in

Connection with the Adoption of Part Four of the Civil Code of the Russian Federation'

Resolution of the Plenum of the Supreme Court of the Russian Federation and Plenum of the Supreme Arbitration Court of 1 July 1996, N 6/8, 'On Certain Questions Arising in Connection with the Application of Part One of the Civil Code of the Russian Federation'

Resolution of the Federal Antimonopoly Service (FAS) of the Volgo-Vyatsky District of 17 February 2003, N A43-10716/02-27-10 (amended)

Resolution of the Federal Antimonopoly Service (FAS) of the Volgo-Vyatsky District of 30 March 2006, N A17-619/3-2005

Resolution of the Federal Antimonopoly Service (FAS) of the Northwestern District of 2 February 2006, N A56-20578/2005

Resolution of the Federal Antimonopoly Service (FAS) of the North Caucasian District of 16 December 2003, N Ф08-4839/03

Resolution of the Federal Arbitration Court of the Moscow District of 27 May 2009, N КГ-А40/4336-09

Rules for Preparation of Application (documents and materials) for Registration of Computer Sowtware and Databases adopted by the Order of the Russian Ministry of Education and Science (29 October 2008) №324

Legal problems related to protection of rights to computer software and reverse engineering received extensive coverage in the paper by Samuelson P and Scotchmer S, 'The Law and Economics of Reverse Engineering' (2002) 111 The Yale Law Journal 1575-1663

Draft Federal Law № 47538-6, 'On Introducing Amendments to Parts One, Two, Three and Four of the Civil Code of the Russian Federation and to some legislative acts of the Russian Federation'

Russian Presidential Academy of National Economy and Public Administration, (2012). Consequences of Weak Competition: Quantitative Assessment and Policy Implications (expert analytical report). Economic Policy, №6, (2012)

Sudarikov S.A. Intellectual Property Law (Prospekt, 2010)

Tyrole J, 'Markets and Market Power: Industrial Management Theory' 2nd edition (amended). St.Petersburg: School of Economics, v.II., 2000

Criminal Code of the Russian Federation

Williamson O, Comparing Alternative Approaches to the Economic Management Analysis in "Lessons of Business Management" Compiled by A.A. Demin, V.S.Katkalo. (St. Petersburg: Lenizdat, 1994) p.51-63

Williamson O, Economic Institutions of Capitalism. Companies, Markets, Relationship Contracting. (St.Petersburg: Lenizdat, 1996)

Federal Law №259-FZ, 'On Introducing Amendments to Part Four of the Civil Code of the Russian Federation (4 October 2010)

Shastitko A E, New Institutional Economic Theory (M: TEIS, 2010) 4th ed.

Shastitko A E, 'Antitrust Law in Russia: To Be or Not to Be?' (2012) 3 Economic Policy 50-70

Shastitko A E, Economic Theories of Organization (a manual) (M: INFRA-M, 2007)

Shastitko A E and Kurdin A A 'Antitrust Legislation and Protection of Intellectual Property in Emerging Market Economies' (2012) 1 Voprosy Ekonomiki 84-95

Parallel Import: Busting the Myth

Parallel Import: Busting the Myth

Translation from Russian

Igor Aleksandrovich Drozdov

Skolkovo Foundation,
Senior Vice President.
PhD in Law

Aleksey Yurievich Ivanov

Skolkovo Foundation,
Director of the Legal Policy and Social Development Department.
Harvard University LL.M.

1. Parallel Import as a Legal Phenomenon

Parallel import is a phenomenon stemming from the existing legal framework, although it has no clear legal qualification. The term gives rise to many contradictory interpretations because confusingly combines the public law category of imports (customs regime) and the private law institution of intellectual rights, which is actually the key to this phenomenon.

Understanding parallel import requires a clear understanding of the legal context from which it stems.

As noted by V. A. Dozortsev, a key ideologist behind Part IV of the Russian Civil Code, the institution of intellectual property emerged mainly due to the "need to include the results of intellectual efforts in economic turnover."

The exclusive right to *intellectual property (IP)* is a special legal category invented to make intellectual products (works of art, inventions, trademarks, etc.) tradable, similar to tangible objects. As noted by V. A. Dozortsev, a key ideologist behind Part IV of the Russian Civil Code, the institution of intellectual property emerged mainly due to the "need to include the results of intellectual efforts in economic turnover."[1]

When people realised IP could be traded, the real right in property was the principle tool used to ensure the turnover of commodities. As a result, when this possibility was institutionalized in the late 18th to early 20th centuries, the exclusive right to IP was defined similarly to the real right in property.

Article 1229 "Exclusive Right" of the Russian Civil Code describes this mechanism as follows:

The person holding the exclusive right to the result of intellectual efforts or to a means of individualisation (*right holder) is entitled to use such result or such means at his own discretion by any means that does not conflict with the law*. The right holder may, at his/her own discretion, either authorise other persons to use, or prohibit them from using, the result of intellectual efforts or means of individualisation. *Other persons may not use such results of intellectual efforts or means of individualisation without consent of the right holder*, unless otherwise provided for in the Code.

We see that this provision is worded following the same logic as is used in the provision on the real right in property (Article 209 of the Russian Civil Code), which provides that the owner may, at his/her own discretion, *do, with respect to property owned by him/her, any acts* that do not contradict the law, or any other laws that do not infringe on the rights or the legally protected interests of other people.

A comparison of options available to the "right holder" in the institution of intellectual rights and the "owner" in the institution of real rights reveal noticeable differences.

With regard to the object owner, the legislator uses the term *acts*, which has no legal meaning *per se*. This is simply a commonly-used word, understandable to anyone. Doing acts with things is a normal and comprehensible phenomenon of real life.

With regard to the holder of the exclusive right to IP, the legislator uses a special term – "*use of the results of intellectual efforts or means of individualisation."* The notion of the use of an intangible object (ideas, knowledge, and information) is not very clear. For this reason, the legislator introduces, with respect to the exclusive right to IP, detailed and notably, different lists of acts that are considered to fall under IP with regard to every protected item of intellectual rights (see paragraph 2 of Article 1270 of the Russian Civil Code for works of art; paragraph 2 of Article 1358 for inventions, utility models and production prototypes; paragraph 3 of Article 1421 for breeding achievements; paragraph 2 of Article 1454 for integrated circuit layout; paragraph 1 of Article 1466 for manufacturing secret; paragraph 2 of Article 1484 for trademarks; paragraph 2 of Article 1519 for the name of the place of origin; and paragraph 1 of Article 1539 for commercial designation).

The variety of detailed lists of different types of use for each category of IP clearly shows that there is no universal understanding of what the use of intangible objects (ideas, information, and knowledge) actually is.

The key issue is how to differentiate between the category of IP use and the category of doing acts with an object, or, to put it otherwise, the conflict between intellectual and real rights.

In Article 1227 "Intellectual Rights and Right of Ownership" of the Russian Civil Code, the legislator has attempted to solve this conflict in general by stating that "intellectual rights do not depend on the right of ownership to a tangible medium (object) in which the relevant result of intellectual efforts or means of individualisation is expressed." Thus, the legislator divides intellectual rights to intangible objects and real rights to tangible objects into two parallel realities. This allows the following conclusion: the legislator clearly differentiates between "acts with things" and the "use of results of intellectual efforts." These two categories are presented as two non-intersecting realities that exist according to their own rules.

The legislator clearly differentiates between "acts with things" and the "use of results of

1 V.A. Dozortsev, Intellectual Rights: Notion. System. Codification Objectives. A compilation of articles / Private Law Research Centre. (M.:Statut, 2003), p. 13.

intellectual efforts." These two categories are presented as two non-intersecting realities that exist according to their own rules.

However, at the same time a whole range of so-called *types of use of IP* indicated in the above Articles of the Russian Civil Code are described using the categories of the real world; for instance, the sale of copies of a work of art, a product that uses an invention, seeds of a breeding achievement, or integrated circuits that include layouts. In all these cases, acts with things *per se,* rather than with IP (ideas, knowledge, and so on), are held to be an infringement on intellectual rights, i.e. exclusive rights to IP.

It turns out that the general provision set out in Article 1227 of the Russian Civil Code regarding the parallel coexistence of the worlds of intellectual rights and real rights fails to solve the conflict existing between these two worlds. By selling a certain thing, the owner, who, according to legislative logic, may do any acts with this thing, may at the same time infringe on the rights of the holder of the exclusive right to IP "expressed" in this thing.

Lawyers brought forward an approach known as "exhaustion of the exclusive right." This approach aimed to prevent the institution of intellectual rights from blocking the circulation of things, while at the same time allowing the satisfaction of the legitimate interests of the right holder in monetisation of his or her intellectual efforts.

Failure of the above provision to settle the arising conflict compelled lawyers to bring forward an approach entitled known as "exhaustion of the exclusive right." This approach aimed to prevent the institution of intellectual rights from blocking the circulation of things, while at the same time allowing the satisfaction of the legitimate interests of the right holder in monetisation of his or her intellectual efforts. Under this approach, the interest of the right holder was restricted to the "first sale" of the thing that expressed the IP owned by the right holder, while further circulation of the thing was free from any intellectual rights.

This approach emerged from historic decisions made by the U.S. Supreme Court in the late 19th – early 20th centuries, and was then incorporated into laws of all major industrial powers. For example, in *Adams v. Burke* (1873)[2], the U.S. Supreme Court held that "*in the essential nature of things, when the patentee, or the person having his rights, sells a machine or instrument whose sole value is in its use, he receives the consideration for its use and he parts with the right to restrict that use. The article, in the language of the Court, passes without the limit of the monopoly. That is to say, the patentee or his assignee having in the act of sale received all the royalty or consideration which he claims for the use of his invention in that particular machine or instrument, it is open to the use of the purchaser without further restriction on account of the monopoly of the patentees.*"[3] A similar approach was expressed with regard to copyright in the decision of the U.S. Supreme Court regarding a dispute between an editor and a bookseller in 1908.[4] In this case, the editor wanted to impose terms of further sale of certain books on the bookseller citing the editor's exclusive right to a work of art expressed in these books. The Court, however, took the side of the bookseller and held that the editor's interest is only restricted to the market launch of the tangible object (the book).

The ideology of this approach is well described in a noteworthy decision by U.S. Judge and researcher Richard Posner.[5] Among other things, he pointed out that, were it not for the exhaustion doctrine, we would have to issue a mandatory license to the buyer for each thing he buys.

In the continental legal tradition, the concept of exhaustion of the exclusive right to IP by first sale (commercialisation) of the thing in which such IP is expressed was reflected in the rule set by the Imperial Court of Germany in 1902: "If the patentee has marketed his products under the protection of a right that excludes others, he has enjoyed the benefits that a patent right confers on him and thereby consumed his right."[6]

"If the patentee has marketed his products under the protection of a right that excludes others, he has enjoyed the benefits that a patent right confers on him and thereby consumed his right." Decision of the Imperial Court of Germany, 1902.

In Russian law, the *first sale* doctrine has been reflected in a number of provisions of the Russian Civil Code. For example, Article 1272 "Distribution of the Original or Copies of a Published Work of Art" provides that if the original or copies of a lawfully published work of art are introduced into civil circulation by sale or otherwise, the original or copies of such work may be further distributed without consent by, and without paying royalties to, the right holder.

The parallel import concept introduces a new complication into the above model of interrelations between intellectual and real rights by linking the exhaustion of the exclusive right to IP not only to the sale of the thing, but also to the import (a category of public law).

2 See: Adams v. Burke, 84 U.S. 17 Wall. 453 (1873). http://supreme.justia.com/cases/federal/us/84/453/case.html.

3 See: Adams v. Burke, 84 U.S. 17 Wall. 453 (1873).

4 See: Bobbs-Merrill Co. v. Straus, 210 U.S. 339 (1908). http://supreme.justia.com/cases/federal/us/210/339

5 See: Jack Walters & Sons Corp. v. Morton Building, Inc., 737 F.2d 698, 704 (7th Cir. 1984).

6 51 RGZ 139 – Duotal. Quoted from: Christopher Heath, Parallel Imports and International Trade (WIPO Report presented at the Annual Meeting of the International Association for the Advancement of Teaching and Research in Intellectual Property at the headquarters of WIPO in Geneva (July 7-9, 1999). http://www.wipo.int/sme/en/ip_business/export/international_exhaustion.htm.

The parallel import concept introduces a new complication into the above model of interrelations between intellectual and real rights by linking the exhaustion of the exclusive right to IP not only to the sale of the thing, but also to the legal factor of public law as import. It turns out that the exclusive right to the result of intellectual efforts expressed in a thing that has been sold *resuscitates* once this thing has crossed the national border of a country that prohibits parallel imports.

From a technical, legal standpoint, so-called regimes of exhaustion of exclusive rights exist: national (where the first sale doctrine only applies to the market of a single country), regional (where the first sale doctrine applies to a number of countries) and international. The international exhaustion regime does not provide for any geographic restrictions to the first sale doctrine, or to recognition and protection of the right of ownership or most exclusive rights to IP.[7]

The evolution of international trade introduced the concept of dividing applicability of the private law institution of the exclusive right to IP and its exhaustion rules into geographic segments. Until then, the reality of international trade was such that right holders did not need to divide the global market into geographic segments. The first sale doctrine evolved within the scope of mainly domestic trade growth.

In connection with this, it is noteworthy that the court decisions and legislation that established the first sale doctrine globally did not affect geographic application of the doctrine.

The legislator approved the first sale doctrine explicitly to restrict the ability of holders of exclusive rights to IP to divide markets into segments, which falls in line with the fundamental principles of the competition law.

It is interesting that in its recent decision directly concerning application of the first sale doctrine in the modern context,[8] the U.S. Supreme Court highlighted that during the period when this doctrine arose, exclusive rights to IP, although considered a means for granting a certain restricted monopoly to the right holder, were never viewed as a legal instrument for geographic segmentation of the market or price discrimination of consumers. Quite the contrary, the legislator approved the first sale doctrine explicitly to restrict the ability of holders of exclusive rights to IP to divide markets into segments, which falls in line with the fundamental principles of the competition law.[9]

The U.S. Supreme Court has clearly concluded that the first sale doctrine in the form it was set out in the U.S. intellectual property right does not provide for any market segmentation, whether on a national or a global level.

In the above decision, the U.S. Supreme Court has clearly concluded that the first sale doctrine in the form it was set out in the U.S. intellectual property right does not provide for any market segmentation, whether on a national or a global level. Any article, wherever it has been legally sold, in the U.S. or elsewhere, may have access to free civil turnover regardless of the intentions of the holder of the exclusive rights to IP expressed in such article.[10]

It is quite representative that in this benchmark case, the U.S. Supreme Court referred to the traditional legal concept of ruling out contractual terms that restrict legal capacity to justify its conclusions about the nature of the first sale doctrine. For instance, by way of an analogy to copyright relations, the Supreme Court referred to a key lawyer of Elizabethan England, Sir Edward Coke, who, in his discourse about the limits to which contractual freedom can be restricted, stated that if the seller of an article includes in the agreement a condition providing that the buyer has no right to resell such article, then this condition will be against the very nature of trade turnover and human relations.[11] The U.S. Supreme Court drew on this general statement to conclude that a law that permits a right holder to control the resale or other disposition of a chattel once sold would be equally against the very nature of economic relations between people.[12]

7 It would actually be true to say that most civil law institutions exist under the international regime. E.g. the right of ownership or contractual obligations are, as a rule, recognised in any modern civilised country, wherever they have arisen.

8 Kirtsaeng v. John Wiley & Sons, Inc., No. 11-697 (U.S. March 19, 2013). http://www2.bloomberglaw.com/public/desktop/document/Kirtsaeng_v_John_Wiley__Sons_Inc_No_11697_2013_BL_71417_US_Mar_19/1.

9 "The Constitution describes the nature of American copyright law by providing Congress with the power to „secur[e]" to „[a]uthors" „for limited [t]imes" the „exclusive [r]ight to their...[w]ritings." Art. I, §8, cl. 8. The Founders, too, discussed the need to grant an author a limited right to exclude competition. <...> But the Constitution's language nowhere suggests that its limited exclusive right should include a right to divide markets or a concomitant right to charge different purchasers different prices for the same book, say to increase or to maximise gain. Neither, to our knowledge, did any Founder make any such suggestion. We have found no precedent suggesting a legal preference for interpretations of copyright statutes that would provide for market divisions. <...> To the contrary, Congress enacted a copyright law that (through the „first sale" doctrine) limits copyright holders' ability to divide domestic markets. And that limitation is consistent with antitrust laws that ordinarily forbid market divisions.' Ibid, P. 31-32.

10 In particular, the U.S. Supreme Court highlights: 'The common-law „first sale'' doctrine, which has an impeccable historic pedigree, makes no geographical distinctions.' Ibid, Syllabus, P. 3.

11 'In the early 17th century Lord Coke explained the common law's refusal to permit restraints on the alienation of chattels. <...> Lord Coke wrote: „[If] a man be possessed of ... a horse, or of any other chattel ... and give or sell his whole interest ... therein upon condition that the Donee or Vendee shall not alien[ate] the same, the [condition] is voi[d], because his whole interest ... is out of him, so as he hath no possibility of a Reverter, and it is against Trade and Traffi[c], and bargaining and contracting betwee[n] man and man: and it is within the reason of our Author that it should ouster him of all power given to him."' Ibid, P. 17.

12 A law that permits a copyright holder to control the resale or other disposition of a chattel once sold is similarly „against Trade and Traffi[c] and bargaining and contracting." Ibid, P. 17

The above mentioned U.S. Supreme Court decision, a perfect example of discussion on the first sale doctrine of employment, revealed another important aspect of the problem: its connection to the states' interest in foreign trade in the developing conditions of the global economy.

In her dissenting opinion on the above decision by the U.S. Supreme Court, Justice Ruth Bader Ginsburg pointed out the immediate relation between the U.S. Government's policy on trade negotiations and a certain interpretation of the first sale doctrine principles, implying that the global market can be divided into geographic segments. Among other things, Justice Ginsburg stated that she stood against the relevant decision of the Supreme Court to comply with the firm position taken by the U.S. Government in international trade negotiations.[13]

She highlighted that *"because economic conditions and demand for particular goods vary across the globe, copyright owners have a financial incentive to charge different prices for copies of their works in different geographic regions. Their ability to engage in such price discrimination, however, is undermined if arbitrageurs are permitted to import copies from low-price regions and sell them in high-price regions*."[14]

"Weighing the competing policy concerns, our Government reached the conclusion that widespread adoption of the international-exhaustion framework would be inconsistent with the long-term economic interests of the United States,"[15] Justice Ginsburg noted.

"Weighing the competing policy concerns, our Government reached the conclusion that widespread adoption of the international-exhaustion framework would be inconsistent with the long-term economic interests of the United States." Justice Ruth Bader Ginsburg, U.S. Supreme Court.

In fact, Justice Ginsburg suggested submitting the interpretation of the first sale doctrine to the U.S. external policy interests and was indignant that the U.S. Supreme Court did not take into account this important factor: "While the Government has urged our trading partners to refrain from adopting international-exhaustion regimes that could benefit consumers within their borders but would impact adversely on intellectual-property producers in the United States, the Court embraces an international-exhaustion rule that could benefit U.S. consumers but would likely disadvantage foreign holders of U.S. copyrights."[16]

"While the Government has urged our trading partners to refrain from adopting international-exhaustion regimes that could benefit consumers within their borders but would adversely impact intellectual-property producers in the United States, the Court embraces an international-exhaustion rule that could benefit U.S. consumers but would likely disadvantage foreign holders of U.S. copyrights."

In the above case, the U.S. Supreme Court refused to consent to the politico-economic arguments of Justice Ginsburg and established the international exhaustion principle as a logical consequence of the legal nature of the first sale doctrine free of any geographical restrictions.

Benefits that can be derived from price zoning of the global market have a material impact on national decision-making regarding the geographical borders of exhaustion, i.e. regulation of *parallel imports*.

13 'I would resist a holding out of accord with the firm position the United States has taken on exhaustion in international negotiations.' Ibid. Dissenting Opinion, P. 22

14 Ibid, Dissenting Opinion, P. 2.

15 Ibid, Dissenting Opinion, P. 20

16 Ibid, Dissenting Opinion. P. 20

2. Political and Economic Aspects of Parallel Import Regulation

It is necessary to notice none of the international conventions related to intellectual property require that national legislators establish geographical borders for the first sale doctrine.

None of the international conventions related to intellectual property require that national legislators establish geographical borders for the first sale doctrine.

Furthermore, most developed nations, including the U.S. and Germany, have no such requirements. As we have shown above with the arguments of the U.S. Supreme Court (we remind that it was the U.S. Supreme Court that first introduced the first sale doctrine into global jurisprudence), the concept of geographical restriction of the first sale doctrine contradicts the fundamental principles of economic regulation.

It is quite representative that Article 6 of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) also relies on the concept that geographic restriction of the first sale doctrine (exhaustion of exclusive rights) contradicts the goals and objectives of global trade liberalisation and may *per se* be disputed by Member States of the World Trade Organisation (WTO). To prevent this, the above-mentioned Article 6 of TRIPS specifically provides that exhaustion of exclusive rights must be excluded from disputable matters under the dispute settlement procedure applicable to the WTO.

In other words, although the segmentation of the global market through geographic restrictions to applicability of the first sale doctrine is manifestly incompliant with the principles of global trade regulation in the framework of the WTO, such incompliance cannot be disputed, i.e. it is implicitly acceptable, even though contradictory to the goals of the WTO.

We would like to highlight that the final 1998 report of the Working Group on the Interaction between Trade and Competition Policy indicated that the provisions of the intellectual property law that permit copyright holders to prohibit parallel imports may be used to constrain competition through market segmentation and international trade restrictions. The Group suggested that the issue of parallel imports and the relevant copyright exhaustion regime should be removed from priorities of the Group.[17]

The competition principles and policies approved by the U.N. General Assembly directly provide that the practice of supporting prices and segmenting the global market by imposing restrictions on parallel import is an anti-competitive business practice.[18]

The competition principles and policies approved by the U.N. General Assembly directly provide that the practice of supporting prices and segmenting the global market by imposing restrictions on parallel import is an anti-competitive business practice.

As such, geographic restrictions to applicability of the first sale doctrine can only be initiated by national legislators.

Since geographic restrictions to applicability of the first sale doctrine can only be initiated by national authorities, then, from the perspective of the public choice theory, the act of decision-making must somehow be motivated. But the rationale for introduction of such restrictions into Russian law relies either on references to some imaginary "international obligations" of Russia, for example, in Ruling No. 171-0 of the Russian Constitutional Court dated 22 April 2004: "The prohibition of such method of using the trademark of the right holder as the import of products marked with this trademark to the Russian Federation is intended to ensure compliance with international obligations of the Russian Federation related to protection of intellectual property"; or is built "by contradiction" when its advocates demand proofs of the need to abandon the restrictions rather than justify the need to introduce the same.

In certain other countries the introduction of relevant exhaustion regimes is discussed based on a profound analysis of advantages and disadvantages for the national economy and social development.

In certain other countries the introduction of relevant exhaustion regimes is discussed based on a profound analysis of advantages and disadvantages for the national economy and social development.

A number of priority issues related to exhaustion regimes are reflected in recent studies of the problem. They include:

17 Report (1998) of the Working Group on the Interaction between Trade and Competition Policy to the General Council, Section 120. https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006-1.aspx?Id=19500&IsNotification=False

18 The Set of Multilaterally Agreed Equitable Principles and Rules for the Control of Restrictive Business Practices (first adopted by the General Assembly on Dec. 5, 1980 and reviewed in 1985, 1990, 1995 and 2000 respectively), Sec. D (4)(e). http://rO.unctad.org/en/subsites/cpolicy/docs/CPSet/cpset.htm

- Impact of the choice of the exhaustion regime on public welfare;

- Impact of the choice of the exhaustion regime on incentives for innovation.

For example, when explaining the political choice of the regional exhaustion regime by the European Union, Christopher Stothers stated in his book[19] that the restrictions (barriers) to parallel imports from outside Europe became necessary to protect the free trade within the European Union and to support European industries. If some EU Member States allowed parallel imports, the whole idea of the common domestic EU market would be distorted due to lower prices in those countries. By protecting its European industries (supporting exports and employment), the EU is safeguarding its domestic market against re-imports of its own goods released in international markets at lower prices. Meanwhile, parallel imports are permitted within the domestic EU market. As such, the EU's richest countries – Germany, Denmark, and Sweden where prices have historically been higher – are the major destination markets of parallel imports, while Greece and Spain, where prices are lower than in the region overall, are key exporters.

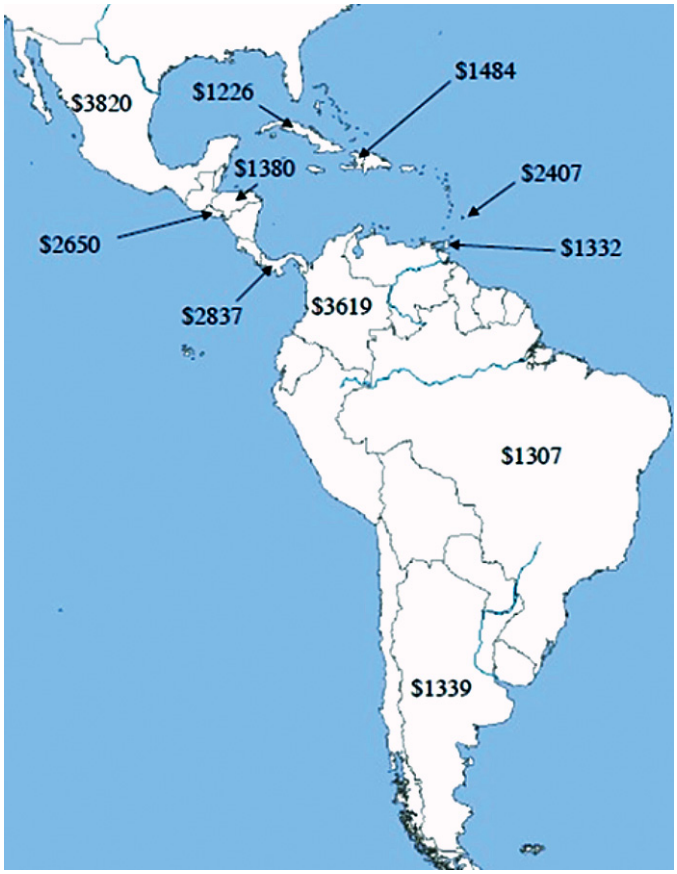
In turn, many developing countries cannot afford the price segmentation of the global economy that is being imposed on them. For instance, in response to the urgent need to deal with HIV, the Kenyan government reformed its patent law and authorised parallel imports of relevant medicines. At time of writing the statistics are as follows: 300 people die in Kenya on a daily basis, while a total of 1.5 million HIV-positive people live in the country. The legislative amendments have allowed importing necessary generic medicines at affordable prices.

In turn, many developing countries cannot afford the price segmentation of the global economy that is being imposed on them.

Perhaps, most studies on parallel imports analyse the pharmaceutical market. Researchers focus on this sector for the following reasons: first, parallel imports typically occur in high-value added industries; second, the pharmaceutical sector offers reliable long-term statistics; and third, the cost and availability of pharmaceutical products are critical factors affecting health and welfare.

Major pharmaceutical producers usually state that their pricing policies with regard to key medicines are driven by public welfare requirements and the desire to provide access to affordable medicines. Researchers note, however, that companies may also use health statistics to set higher prices for popular products[20] in a region (similarly to discrimination demonstrated by insurers when assessing the insurance premium).

The paper by William Fisher and Talha Syed contains examples of policies built on similar logic. For instance, in May 2002, the cost of an annual 3TC/AZT/EFV AIDS treatment course ranged from USD 1,226 to USD 3,619 for Latin American countries. However, its cost in Argentina (USD 1,339) was just about one third of the Columbian cost, while Argentina is considerably richer (whose GDP is twice as large as Columbia's). The price range of this treatment course is shown in the Figure below:



Danzon and Furukawa[21] and Rebecca Hellerstein[22] published studies with similar results.

Studies often record a positive performance shown by prices for pharmaceutical products, once parallel imports are permitted.

Given the Columbian example, it is no wonder that studies often record a positive performance shown by prices for pharmaceutical products once parallel imports are permitted. The comparative table below shows the results of calculations by Kanavos, West and Mahon, and Pedersen that

19 C. Stothers, Parallel Trade in Europe: Intellectual Property, Competition and Regulatory Law. (Hart Publishing, 2007).

20 Fisher W., Syed T. Infection: The Health Crisis in the Developing World and What We Should Do About It. Chapter 6: Differential Pricing. Stanford University Press (forthcoming). Available at URL: http://cyber.law.harvard.edu/people/tfisher/Drugs_Chapter6.pdf.

21 P. Danzon, M. Furukawa, Prices and Availability of Pharmaceuticals: Evidence from Nine Countries (2003) Health Affairs http://content.healthaffairs.org/cgi/content/full/hlthaff.w3.521v1/DC1.

22 R. Hellerstein, Do Prices Vary Across Rich and Poor Countries? Social Science Research Council Publication (2003) 29.

demonstrate direct public savings from parallel imports in the pharmaceutical sector (in million EUR per year).

	Kanavos[24]	West and Mahon[25]	Pedersen[26]
England	6.9	342	237
Germany	17.7	194	145
Denmark	3.0	47	14.2
Sweden	3.8	16	45.3
Total:	31.4	599	441.2

The most recent research published in November 2011 by Pedersen, shows that annual savings for the same countries in 2004-2009 was about 0.5 billion EUR despite an economic slowdown.

Ganslandt and Maskus, authors of another well-known economic study,[26] have managed to track the behaviour of manufacturers of original products after parallel importers have first entered the market. In their work, the researchers show how prices for medicines in Sweden fell as parallel imports grew from 1995 to 1998. Price cutbacks by original manufacturers reached 19%. The mere risk of competition against parallel importers that arose in Sweden after the country joined the EU caused a decline in market prices in general.

According to Ipek Eren-Vural,[27] who studied the drastic changes made to the pharmaceutical patent policies of developing countries over the last 20 years, the organised political struggle for the application of exclusions from TRIPS resulted in a rather mild regime of pharmaceutical patent regulation in India (including authorisation of parallel imports). This outcome was facilitated by the strong influence of local pharmaceutical manufacturers, low external exposure of the market to the interests of transnational companies and the ability of local manufactures to forge powerful political alliances.

Importation of goods by independent importers allows market needs to be better met. As a rule, this occurs when prices for a product in the exporting country are lower than in the importing country, and when the right holder does not supply a product to the importing country.[28] A noticeable share of medicines, books, CDs and DVDs, software, electronics and vehicles are brought by independent suppliers to markets that permit such imports. In this manner, free parallel imports strengthen the position of the importing country and weaken that of right holders from the exporting country.

Importation of goods by independent importers allows market needs to be better met. As a rule, this occurs when prices for a product in the exporting country are lower than in the importing country, and when the right holder does not supply a product to the importing country.

Vivid examples of such a phenomenon include the vehicle market of Israel and the book and sound recordings market of Australia. These examples have been thoroughly examined by researchers.

The Israeli vehicle market almost fully depends on imports from the US, Europe and the Far East. Its local commercial manufacturing of vehicles is weak due to the low capacity of the domestic market, absence of domestic heavy engineering and remoteness from the U.S. and European markets.

According to the Commission for Enhancement of Israeli Competitiveness, local consumers pay a higher price for imported cars due to weak competition in the car supply market (in 2012, the difference between original and non-original spare parts reached 700 to 4,000 shekels). On 23 February 2012, Professor Yaron Zalik submitted a report to Israeli Transport Minister Kats with the findings and recommendations of the Commission that encouraged parallel imports.[29] Kats publicly defended the report, accepted its findings and created an ad hoc group to implement the recommendations.

Using the Herfindahl-Hirschman Index, Michael Porter method,[30] and a number of other instruments, the Commission thoroughly examined the impact of the concentration of companies on the level of competition in the market and the surplus[31] (excess) that the manufacturers have.

About 55% of the Israeli automobile market (annual capacity: ILS 100 billion) is consolidated by four importers (out of seventeen), approximately 64% of the car rent market is consolidated by four companies, and about 54% of the insurance market in the hands of four groups. The Commission found that the country's automobile market was inefficient (*market*

23 P. Kanavos, J. Costa-I-Font, S. Merkur, M. Gemmill, 'The Economic Impact of Pharmaceutical Parallel Trade in European Union Member States: A Stakeholders Analysis' Special Research Paper (London School of Economics and Political Science 2004).

24 P. West, J. Mahon, Benefits to Payers and Patients from Parallel Trade (York Health Economics Consortium 2003).

25 U. Enemark, K. M. Pederson, Parallel imports of pharmaceuticals in Denmark, Germany, Sweden and the UK, 2004-2009: An analysis of savings (Odense: University of Southern Denmark 2011).

26 M. Ganslandt, K. Maskus, Parallel imports and the pricing of pharmaceutical products: evidence from the European Union (2005) 23 Journal of Health Economics 1035-1057.

27 I. Eren-Vural, Domestic Contous of Global Regulation: Understanding the Policy Changes on Pharmaceutical Patents in India and Turkey (2007) 14 Review of International Political Economy 105-142.

28 R. MacGillivray, Parallel Importation: A Framework for a Canadian Position on Exhaustion of Intellectual Property Rights. SJD Thesis. (University of Troronto, Faculty of Law 2008).

29 Report by the Public Commission for Development of Competition in the Automobile Industry as Ordered by the Israel Ministry of Transport, National Infrastructures and Road Safety; Under the editor of Professor and Certified Accountant Y. Zalik (2012).

30 Michael E. Porter, How Competitive Forces Shape Strategy, (March-April 1979) Harvard Business Review P. 137.

31 This is the difference between the total income of the manufacturer from the sale of a given amount of any product and the minimum income that enables the manufacturing of the same amount.

failure)[32], mainly due to the oligopolistic confederacy among the four major importers of the industry.

In the automobile market, prices are fixed in agreements between major importers on the back of an almost total lack of competition among them: in Israel, FOB[33] prices for cars (according to the Commission) are the world's lowest, while CIF[34] prices are the world's second highest. According to some official car dealers, importers actually force them to buy original spare parts only from such importers. This also affects the ultimate product price.

Oligopolistic pricing and consolidation of large market players have become possible due to restrictions to parallel imports and insufficient regulatory intervention which would prompt competition within the domestic market (across the entire chain: manufacturer – importer – car dealer – repair shop). The Commission believes that due to existing structural issues Israeli importers are competing only for brands and reputation, but not for prices.

The Commission believes that Israeli consumers are vulnerable in the existing automobile market. By referring to the work of renowned economist Joseph Stiglitz, the Commission concludes that in the context of artificial import constraints affecting the public welfare, intervention by the government is a justified step.

The Commission believes that Israeli consumers are vulnerable in the existing automobile market. By referring to the work of renowned economist Joseph Stiglitz,[35] the Commission concludes that in the context of artificial import constraints affecting the public welfare, intervention by the government is a justified step. Some recommendations of the Commission are listed below:

- Restrict the number of brands[36] that may be distributed by one dealer on exclusivity terms to foster competition not only between brands, *but also between their distribution channels;*
- Encourage transactions via personal (direct) import to expand the range of opportunities available to consumers;
- Compel official importers to provide guarantees for vehicles imported by parallel importers;
- Allow all car repair shops approved and authorised by the Ministry of Transport to service all vehicles, including those supplied to Israel by non-official importers, and provide reference documentation and/or technical equipment at one price;
- Allow the purchase of spare parts in any repair shops (not only in repair shops of importers of "official" imports). Car repair shops must provide repair services even if spare parts are bought somewhere else (provided that the parts are new);
- Limit the capabilities of major importers (with a market share of 8% and above) to enter into consortium agreements (only with one car manufacturer);
- Authorise every Israeli national to import two cars a year and immediately sell them as second-hand cars;
- Introduce the position of *Pricing Officer* (Ombudsman) to analyse data submitted by major importers (those that import at least one thousand cars a year) and publish the conclusions about the state of the market;
- Introduce the notion of *minor importer* (up to 20 vehicles per year) with a right to special preferences;
- Reduce the level of importers' control over repair shops and expansion of the range of available spare parts;
- Set up a special single web-site to publish the list of available spare parts and relevant prices; and
- Provide consumers with access to cars at prices similar to prices for which cars are acquired by leasing companies (sometimes up to 30% lower).

Despite the natural geographic remoteness of Australia, parallel imports play an important role in this country as well. Due to the lack of wood, small market capacity and the prevalence of the English language, circulation of British and particularly U.S. editions threaten local publishing houses. Even subject to considerable shipping costs, the share of foreign products attains 42%.

Research run by the Productivity Commission (an independent agency of the Australian Government) in 2009 showed that the prices for books in the Australian market exceed their U.S. prices by 35% on average. The key reason for this lies in the restrictions on parallel imports introduced specifically to support domestic market in 1991.

Protectionist measures had a reverse effect (higher prices) and they failed to reach another of their objectives: support Australian authors. For example, one of the restrictions provides that within 30 days after publication of a foreign edition, the domestic producer should have an exclusive right to

32 Market failure (inefficiency) is a market situation where resource distribution or supply of products and services in the market are inefficient. Failures typically occur when some market players have excessive power or are more aware than others. Most often failures are catalysed by monopolies and cartels.

33 FOB (Free On Board) is an international trading term of INCOTERMS used to designate cargo delivery terms providing that the seller must deliver the goods to a port and load the goods to a vessel indicated by the buyer; the costs of delivering the goods on board are borne by the seller.

34 CIF (Cost, Insurance and Freight): delivery under CIF terms means that the seller is deemed to have delivered the goods when the goods are loaded on the vessel in the port of shipment, while the selling price includes the cost of goods, freight or shipping costs, and the cost of shipping insurance.

35 J. Stiglitz, Whither Socialism? (Cambridge and London: MIT Press, 1989).

36 The Commission has found that it is more efficient to limit the number of brands than consortium agreements with manufacturers.

produce and distribute this edition in the Australian market. Since publications by foreign authors dominate the product mix offered by publishing houses, most (2/3) license fees are paid to them. As such, restrictions on parallel imports, while designed to be protectionist, have actually had a reverse effect by reducing buyers' wealth and increasing income of foreign right holders.

While promoting the idea of abandoning parallel import restrictions, the Commission asserted that if the prohibition is cancelled this would not have an adverse impact on the number of local publishers and their product range. The authors have analysed the situation in New Zealand where, despite the significant fragility of the market (its capacity is five times lower than that of the Australian market, while publication costs are, consequently, higher), such restrictions were cancelled in 1998. Contrary to all concerns, the opening of the market to foreign books brought in almost a third of new publishers in the subsequent 5 years, with nine out of ten of such publishers owned by local businesspeople. At the same time, the ratio between market shares (foreign to local publishers) stayed unchanged, while the number of local editions increased (83 new editions or a 6.5% growth for 2007-2008).

In his work[37] Papadopoulos has examined the situation in the Australian market of sound recordings after an amendment was made to the copyright law to introduce the principle of international exhaustion of intellectual property rights and rule out the segmentation of the market for sound recordings.

At the time of the research, 85% of sound recordings marketed in Australia were imported from other countries. Australia accounted for only 2% of global sound recordings sales. Free parallel imports made the market for supply of sound recordings more competitive and cut down the size of royalties payable to foreign copyright holders. Australian consumers benefited from the introduction of the international principle that made the price per CD drop from USD 29.95 to USD 19.95.

Impact by the exhaustion regime on the public welfare attracts ever growing attention in Russia. For example, the story of purchasing coronary bypass stents in the Krasnodar Region has recently been widely covered by the media.[38] An independent supplier who offered equipment at a price twice as low as that of the official distributor (the averaged import price of Abbott stents was RUB 22.6 thousand in CIP terms,[39] against the average price of RUB 66.6 thousand, obtained as a result of a government procurement procedure) was unable to sell the stents without permission by the right holder. A similar situation occurred under proceedings for a case on perinatal equipment of Sonicaid (hospitals have to buy diagnostics monitors from the official distributor at a considerable premium) that were held at a time in courts of the Leningrad and Nizhny Novgorod Regions.[40]

Today, Russia is predominantly an importer of products containing intellectual property.

We have set ourselves the task of assessing to what extent the existing exhaustion regime affects the national economic growth and eventually the growth of public welfare in Russia.

Deeper penetration of innovations in the economy and its higher diversification away from commodity exposure is a priority for Russian economic development.

We are the first in Russia to have run a large-scale sociological study designed to identify the importance of geographic restrictions to exclusive right exhaustion (prohibition of parallel imports) for the operations of small- and medium-size enterprises of the Russian innovative sector.

We are the first in Russia to have run a large-scale sociological study designed to identify the importance of geographic restrictions to exclusive right exhaustion (prohibition of parallel imports) for the operations of small- and medium-size enterprises of the Russian innovative sector.

The study indicates that permission of parallel imports can have a considerable beneficial effect on innovative companies that currently face a host of restrictions to importation of rare and knowledge-intensive equipment that is crucial for their growth and competitiveness in international markets.

37 Papadopoulos T. Copyright, Parallel Imports and National Welfare: The Australian Market for Sound Recordings // The Australian Economic Review. 2000. Vol. 33, No. 4. P. 337-348.

38 Decision by the Federal Arbitration Court of the West Siberian District on Case No. A45-5005/2012

39 CIP or Carriage and Insurance Paid is an international trading term (INCOTERMS-2000), which means that the seller will deliver the goods to a designated carrier and agrees to pay the costs of shipping to the designated destination.

40 Shestakov Ye, Make the Choice: Allow or Prohibit Parallel Imports http://www.intellectpro.ru/articles/?oper=view&news_id=222

3. The Prohibition of Parallel Imports and Its Influence on Russian Innovative Companies

Studies of parallel imports are often focused on manufacturers or end consumers who use foreign products for their personal or family purposes (drinks, perfumes, clothes, electronic home appliances, spare car parts). Much less attention of researchers and journalists is paid to companies and government entities that import goods required for their operation. Key consumers here include knowledge-intensive industries, and the healthcare and education sectors that have high social importance.

The knowledge-intensive innovative industry actively uses foreign products in its operations. Moreover, these products often become simply indispensable for the operation of smaller innovative businesses. We have been unable to find statistics or studies that analyse independent imports from the standpoint of interests of small-size innovative enterprises.

The knowledge-intensive innovative industry actively uses foreign products in its operations. Moreover, these products often become simply indispensable for the operation of smaller innovative businesses.

The sociological study, which included a telephone survey of hundreds of innovative companies and twenty telephone interviews with innovative businesspeople, as well as a content analysis of industry-related online forums, has confirmed: the prohibition of parallel imports directly and materially affects the operation of Russian small-size innovative companies. This Section presents and analyses the results of this study.

Representatives of innovative companies welcomed the sociological survey on the impact of prohibition of parallel imports initiated by the Skolkovo Foundation and implemented by a sociological team from the Centre for the Methodology of Federative Studies of the Russian Presidential Academy of National Economy and Public Administration.

The telephone survey was carried out from 16 to 30 April 2013. The survey covered companies participating in the Skolkovo Project in the area of biomedical, nuclear, space, energy efficiency and information technologies, participants in support programmes of the Foundation for Assistance to Small Innovative Enterprises in Science and Technology, portfolio companies of venture funds cooperating with the Russian Venture Company, as well as members of the Greenfield Project, a platform for hi-tech start-up projects and investors: a total of 314 innovative companies with a track record in procuring and using products of foreign manufacturing.

The survey was intended to identify the level of priority and importance of the parallel import problem for innovative businesspeople.

The following tasks were set:

- Identify key patterns and channels used by innovative companies to purchase products of foreign manufacturing;
- Identify key problems faced by Russian companies in purchasing products of foreign manufacturing;
- Inform respondents of the problem of parallel imports in Russia;
- Identify the categories of goods required for the operation of innovative companies for which the problem of parallel imports is of the highest importance;
- Identify how important the problem of parallel imports is; and
- Identify the attitude of businesspeople towards the legalisation of parallel imports (at the company's level and across the country).

Respondents included employees of companies responsible for procurement of foreign products, or employees aware of the situation of this procurement. More than half of the respondents (52.5%) indicated their positions. We did not specifically ask about the position. The respondent could either provide his or her position in the course of the interview, or be asked by the interviewer. An overwhelming majority of those who named their positions are senior executives (CEOs, Directors responsible for various matters, Chairmen of the Board, founders, or their deputies): 39.1% of the total number of respondents.

The second largest category included skilled professionals (assistants to executives, academic advisers, managers and project leaders), i.e. those who directly deal in their work with purchases of foreign products: 8.5%. Highly skilled professionals (Chief Accountants, Chief Designer, Section Heads or Leaders) accounted for 3.8% of respondents. The smallest category – administrative staff – accounted for 1%. In general,

we can conclude that the status of respondents guarantees reliability of the data obtained (see Fig. 1).

The questionnaire was comprised of eight questions, two of these open-ended:

- Question 3 on types of products purchased;
- Question 5 on problems faced when procuring foreign products.

Question 1 clarified whether the company had experience purchasing foreign products and whether the respondent was ready to discuss this issue.

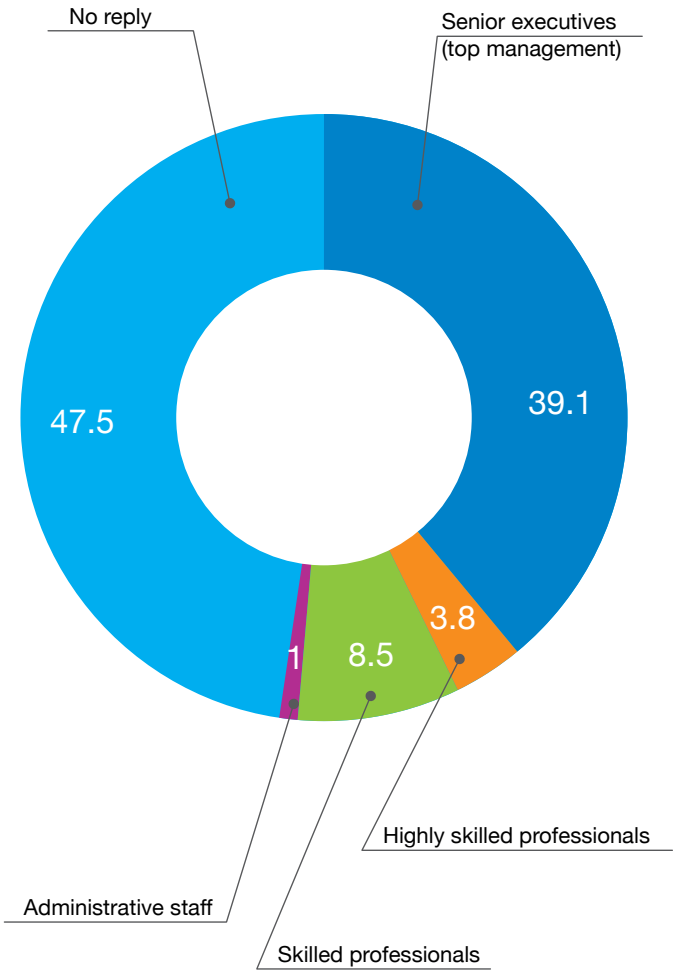


Figure 1

Breakdown of respondent positions

Key channels for foreign products procurement (Question 2)

Table 1. Do you procure official (original) foreign products directly from abroad, from official dealers or from unofficial suppliers?

	Frequency	Percentage of the total number of answers	Percentage of the sampling*
Directly from abroad	103	24.8	32.8
From official dealers/official suppliers	245	58.9	78.0
From unofficial suppliers	48	11.5	15.3
Other	16	3.8	5.1
I don't know	4	1	1.3
	416	100	132.5

*This was a multiple-choice question, so the sum exceeds 100%.

A significant part of respondents use several procurement channels. Most innovative companies purchase products from official dealers/suppliers: 78% of companies that participated in the survey. A substantial number of respondents purchase directly from abroad: 32.8%. Unofficial procurement is much less common: this category was indicated by 15.3% of respondents (see Table 1).

Table 2. Number of procurement channels for foreign products

Number of procurement channels	Frequency	Percentage
1	229	72.9
2	66	21.0
3	18	5.7
No answer	1	0.3
Total	314	100

Most respondents use one procurement channel (72.9%). Some respondents (21%) use two procurement channels, and a few (5.7%) use three. If the company uses two procurement channels, then as a rule it imports "directly from abroad" and "from official dealers/suppliers": 85.3% of relevant respondents provided such an answer. In 12% of the cases, companies with two procurement channels use a combination of official and unofficial suppliers (see Table 2).

Regardless of the number of procurement channels (one, two or three), purchases from official dealers prevail among other methods of procuring foreign products.

Regardless of the number of procurement channels (one, two or three), purchases from official dealers prevail among other methods of procuring foreign products.

Key types of products purchased by respondents (Question 3, open type)

Question 3 asked respondents about the types of products they purchased. It was an open-ended question. The answers were later encoded.

Table 3. Type of products purchased

	Frequency	Percentage of the total number of respondents	Percentage of the total number of answers *
Laboratory and operating equipment	111	25.6	35.7
Raw materials. reagents. component parts. etc.	108	24.9	34.7
Electronics and components	88	20.3	28.3
Computers and server equipment	57	13.1	18.3
Software	39	9.0	12.5
Office equipment	20	4.6	6.4
Other	11	2.5	3.5
Total	434	100.0	139.5

*a multiple-choice question

The study covers companies that purchase different foreign goods. Most companies (35.7%) purchase laboratory and operating equipment, followed by raw materials and reagents (34.7%). Electronics and components ranked third (28.3%). Respondents also indicated computers and server hardware, software, and office equipment (see Table 3).

Perception of foreign products supply to the Russian market. Identifying key issues (Question 4)

Our analysis of the question about key issues arising when buying foreign products allows us to confirm our assumptions about the significance of difficulties inherent in a situation when parallel imports are prohibited and explains why many companies prefer buying goods directly from foreign manufacturers.

Table 4. Situation with foreign products in the Russian market in your industry (%)

	Yes	No	I don't know	Total
Sometimes products supplied to the Russian market are of a lower quality than those supplied to other countries	22	59	19	100
Prices for some foreign products are higher in Russia than in other countries	81	9	10	100
Sometimes foreign innovations enter the Russian market with a delay	76	15	9	100
The range of foreign products available to the Russian market is limited	65	27	8	100
The Russian market has many counterfeit products	31	50	18	100

Our analysis has identified two key trends regarding the supply of foreign products to the Russian market from the perspective of innovative businesspeople.

First, most respondents believe that foreign products offered in the Russian market are original and of rather high quality.

- 50% disagree that the Russian market has many counterfeit products.
- 59% of respondents do not think that lower quality products are supplied to Russia.

Second, respondents are negative about all aspects related to quality of product supplies (product range, prices, shipping time).

- 65% of the respondents believe that the range of foreign products offered in the Russian market is limited;
- 76% think that innovations are released with a delay;
- 81% note that prices for foreign products are higher than in other countries (see Table 4, Fig. 2).

Respondents are negative about all aspects related to the quality of product supplies (product range, prices, shipping time).

Figure 2

Situation with foreign products in the Russian market

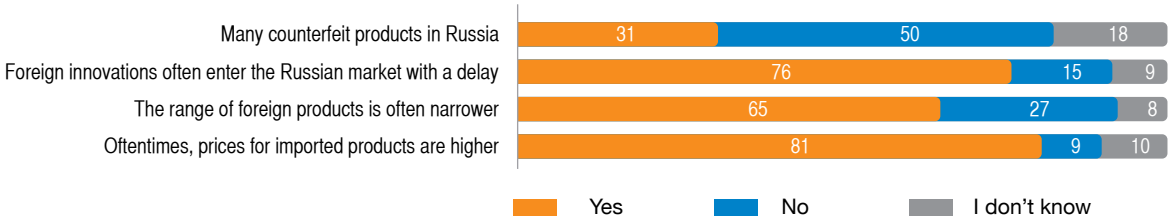
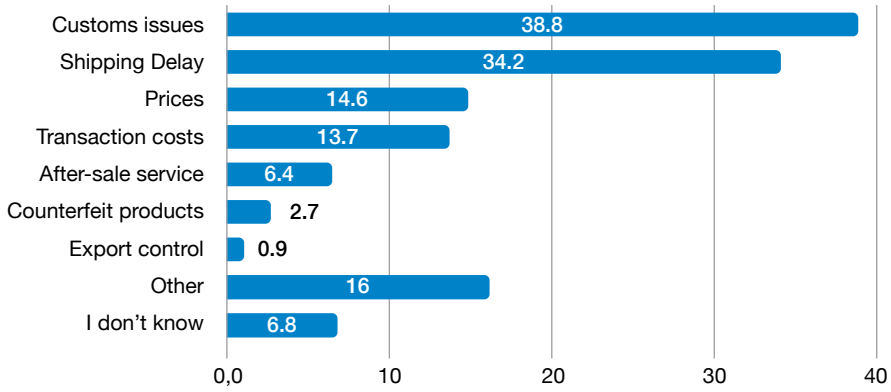


Figure 3

Issues with purchases of foreign products



Key issues faced by innovative companies in purchasing products of foreign manufacturing (Question 5, open-ended)

Respondents were asked an open-ended question about issues they face in purchasing foreign products (Question 5). Their answers were later encoded.

The issues named by respondents can be divided into two categories:

- Most often named: customs issues (38.8%) and product shipping term (32.4%),
- The second category included such issues as transaction costs (14.6%) and product prices (13.7%).

The share of other issues is insignificant and does not exceed 7%. Such issues include:

- after-sale service,
- counterfeit products,
- service control (see Fig. 3).

A more detailed analysis of open-ended questions, including materials of interviews with respondents and online resources, is given below.

Attitude towards the issue of parallel imports (Questions 6, 7, and 8)

Table 5. In your opinion, is the existing prohibition of parallel imports justified or unjustified?

	Frequency	%
Justified	68	22
Unjustified	128	41
I don't know	117	37
Total	313	100
No answer	1	0

There was no (explicit) common opinion about the existing prohibition of parallel imports.

On the one hand, most respondents chose "Unjustified" (41%). The share of those who consider the prohibition to be justified is almost twice as low (22%). But, on the other hand, the share of those who did not know how to answer was quite high as well (37%). As such, we assume that the respondents are poorly aware of the issue of prohibition of parallel imports and simply do not fully understand the legal nature of the issue as, for example, most buyers of consumer goods (see Table 5).

Attitude towards the prohibition of parallel imports and key procurement channels

If we consider the perception of the prohibition of parallel imports as a function of key channels for procurement of foreign products, then we would highlight the following:

The study has identified two equal distributions in the first category (buying directly from the manufacturer): those who consider the prohibition of parallel imports to be unjustified (40.2%), and those who did not know how to answer (also 40.2%). Thus, we may assume that, on the one hand, an important number of those who buy products from abroad are insufficiently aware of parallel imports; on the other hand, many find this prohibition disadvantageous and knowingly bypass it by purchasing from abroad.

In the second category (buying from official dealers), those who consider the prohibition of parallel imports to be unjustified have the highest share: 40.6%. The share of those who do not know how to answer is also high: almost 37%.

In general, we can point out that the procurement method has a minor impact on the attitude towards the prohibition of parallel imports. Each category displays similar trends.

On the whole, the attitude towards the prohibition of parallel imports among companies using a single procurement channel matches the distribution across the sampling: there are two equal groups – those who consider this measure to be unjustified, and those who do not know how to answer (39.9% each).

The share of those who are negative about the prohibition of parallel imports among companies that use two procurement channels is considerably higher, while the share of those who do not know how to answer is considerably lower.

Answers of companies using two procurement channels show interesting differences: they are dominated by those who are negative about the prohibition of parallel imports (48.5%); while the share of those who do not know how to answer, is considerably lower (27.3%). Apparently, representatives of these companies have more knowledge of the situation, have a better understanding of the difference in conditions when using different procurement channels, and have repeatedly faced the problem, as they make up a higher share of those who are aware of the issue of parallel imports. Perhaps they also faced problems due to using a single channel and started to combine procurement channels to streamline their operations.

A more detailed analysis of the attitude towards the prohibition of parallel imports, as a function of the number of channels and methods of procuring foreign products, confirms the previously identified trends:

- Companies that use a single channel are typically poorly aware of the prohibition issue;
- The share of those who are negative about the prohibition of parallel imports among companies that use two procurement channels is considerably higher, while the share of those who do not know how to answer is considerably lower.

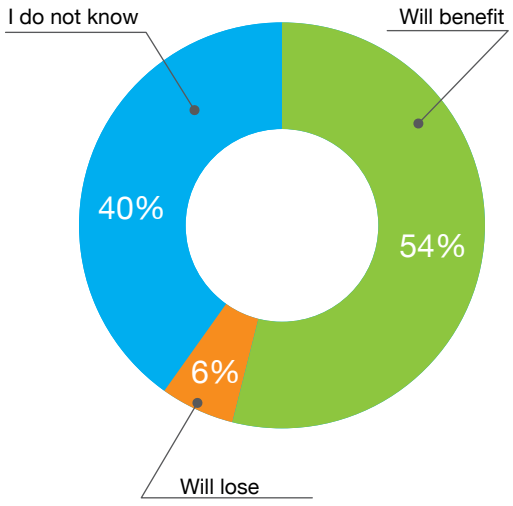
Meaning of legalisation of parallel imports for innovative companies

Table 6. If parallel imports are legalised, will your company benefit or lose?

	Frequency	%
Will benefit	77	25
Will benefit somewhat	91	29
Will lose somewhat	8	3
Will lose	9	3
I don't know	128	41
Total	313	100
No answer	1	0

Figure 4

If parallel imports are legalised, will your company benefit or lose?



More than half of respondents (54%) believe that their companies will benefit from legalisation of parallel imports (25% indicated "will benefit" and 29% "will benefit somewhat"). The share of those who consider this measure to be disadvantageous is very low and does not exceed 6% (see Table 6, Fig. 4).

If we compare two variables: meaning of legalisation of parallel imports for operations of companies and key issues in procurement of products, we see that two trends identified in the overall sampling still persist here. Those companies which identified prices as the key problem in procurement of foreign products are clearly for legalisation of parallel imports: this category has more positive answers and fewer re-

spondentswho do not know how to answer. It is especially noteworthy that nobody from this category expects negative implications for the company from legalisation of parallel imports.

More than half of respondents (54%) believe that their companies will benefit from legalisation of parallel imports.

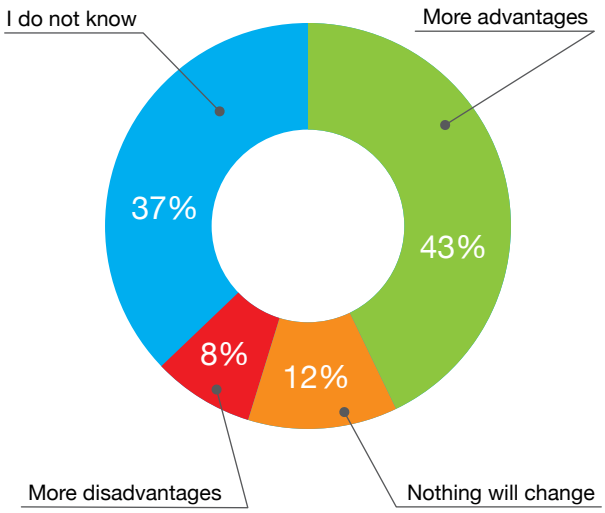
Meaning of legalisation of parallel imports for the Russian economy overall

Table 7. If parallel imports are legalised, will there be more advantages or disadvantages for the Russian economy?

	Frequency	%
More advantages	134	43
More disadvantages	25	8
Nothing will change	39	12
I don't know	115	37
Total	313	100
No answer	1	0

Figure 5

If parallel imports are legalised, will there be more advantages or disadvantages for the Russian economy?



Answers to the last question also confirm the previously identified trends. We clearly see two categories of respondents: those who see clear advantages in the legalisation of parallel imports, including for the Russian economy overall (43%), and those who do not know how to answer (37%). The share of respondents who replied otherwise is considerably lower: 12% believe that this step will have no impact on the Russian economy, while 7% think that this will be disadvantageous (see Table 7, Fig. 5).

An analysis of the meaning of legalisation of parallel imports for the Russian economy from the perspective of key procurement issues identifies the following particularities:

- Respondents that indicated such issues as delays in delivery see clear advantages for the Russian economy from legalisation of parallel imports (54.1%). Thus, delivery terms are an essential issue that constrains operations;
- Scores for the "price" parameters are similar to scores for "delivery terms." We would assume that respondents expect that legalisation of parallel imports will reduce prices for foreign products.

Those companies who identified prices as the key problem in procurement of foreign products are clearly for legalisation of parallel imports: this category has more positive answers and less of those who do not know how to answer.

The quantitative outputs of the survey and their analysis allow us to draw a number of conclusions.

1. Urgency and importance of the parallel imports issue

The prohibition of parallel imports is perceived as an important is perceived as an important, but not urgent, issue for innovative companies. The share of those who do not know how to answer certain questions reaches 40%. The reason for this is that the respondents are poorly informed of the legal and economic nature of parallel imports. Most businesspeople do not fully realise the impact of existing legislative restrictions related to intellectual property protection on their day-to-day operations, while still identifying issues in their operations related to the procurement of foreign products.

2. Key procurement patterns

The study has identified two key patterns for procuring foreign products:

- Using a single procurement channel (72.9% cases), with predominant procurement from official dealers/suppliers;
- Using several procurement channels (26.7% cases): representatives of innovative companies mainly use these two channels and combine procurement from unofficial foreign suppliers with purchases from official dealers, with the latter prevailing;
- About 15% of respondents use services of unofficial suppliers.

3. Key types of products purchased

The study identified the following types of foreign products purchased by innovative companies (since it was a multiple-choice question, the sum exceeds 100%):

- Laboratory and operating equipment (35.7%);
- Raw materials/reagents/component parts (34.7%);
- Electronics and its components (28.3%);
- Computers and server equipment (18.3%);
- Software (12.5%);
- Office equipment (6.4%).

4. Supplies of foreign products to the Russian market

Two trends exist in the perception of foreign products in the Russian markets:

- Foreign products are viewed by most respondents as original and high quality products;
- Respondents indicate a number of important issues that affect the supply process itself: a limited range of products (65%); delay in the entry of novelties in the Russian market (76%); and high prices for foreign products (81%).

In answering the open question, the respondents identified some other groups of issues:

- Customs issues (38.8%),
- Delay in delivery (34.2%),
- Transaction and legislative costs (14.6%),
- Product price (13.7%),
- Issues with after-sale service and localisation of products (6.4%),
- Counterfeiting (2.7%),
- The issue of export control (0.9%).

5. Attitude towards the issue of prohibition of parallel imports

The survey identified two predominant groups: the first considers the prohibition of parallel imports to be unjustified (41%), while the second did not have any position on the issue (37%).

The negative attitude towards the prohibition of parallel imports is primarily characteristic of representatives of those companies that identified such issues as prices for foreign products and long terms of delivery.

If companies use two procurement methods, they are more determined in their attitude towards the prohibition of parallel imports. Among them, the share of those who did not know how to answer (27%) is much lower, with a higher share of those respondents who are negative about the prohibition (48.5%). The conclusion that can be drawn here is that such companies have more experience and are more knowledgeable, allowing them to have a firm and informed position on the issue.

The negative attitude towards the prohibition of parallel imports is primarily characteristic of representatives of those companies that identified such issues as prices for foreign products and long delivery terms.

6. Meaning of legalisation of parallel imports for innovative companies

Most respondents (over 54%) see positive effects for their company from legalisation of parallel imports.

Moreover, this question has identified a considerable share of respondents who are ignorant about the issue of parallel imports (41%).

Thus, a certain amount of effort aimed to inform innovative companies about the outlooks of legalisation of parallel imports seems likely to secure the full support of innovative companies to this measure.

7. Meaning of legalisation of parallel imports for the Russian economy

Respondents found it easier to provide a higher level assessment rather than assess potential implications for their specific companies. 43% of respondents believe that legalisation of parallel imports would be beneficial to the Russian economy; this time the share of those who did not know how to answer the previous question decreased (37%).

A more profound analysis of answers to open-ended questions, interviews with respondents, and online professional forums allow drawing a number of conclusions about the importance of specific problems with procurement of foreign products for innovative companies in the context of the regional exhaustion regime existing in Russia.

Innovative companies often need rare products in extremely insignificant quantities (sometimes even in single quantities), and official distributors may find it simply unprofitable to meet such demand.

Companies often have to buy foreign products directly or via independent suppliers (where possible) due to the lack of supply in the Russian market, often even from official distributors ("weak distribution network," "hard to find a supplier").

Innovative companies often need rare products in extremely insignificant quantities (sometimes even in single quantities), and official distributors may find it simply unprofitable to meet such demand. Issues with ordering small-size batches

mainly affect those who purchase electronic equipment and power metering units, although reagents also suffer from this problem: "We order a rare substance from the official distributor, manufacturer of chemical reagents Sigma-Aldrich, and they are often out of stock; the company finds it unprofitable to stock up on "illiquid goods" in advance. As a result, we have to wait for several months."

Sometimes, low market demand for the product prompts the official distributor to set an excessively high price and offer unattractive terms of cooperation. In such a situation, the only solution is to buy the product directly from the foreign manufacturer. ("The price asked by distributors for these machines is simply unaffordable. We did not even consider potential relations with them"; "if we order the product from an official distributor in Russia, problems will arise everywhere: too long, complex, and costly. If we buy directly from abroad, we will only suffer from the customs bureaucracy.")

Independent (direct) procurement, though more advantageous, has significant negative attributes. Apart from the fact that companies have to tackle all document flow, deal with the customs (see below) and communicate with the seller on their own, the ordering process itself is not easy. Companies often have to order on behalf of individuals, which is just another "headache" as indicated by some respondents.

A representative of a biochemical company participating in the Skolkovo project:

"We order all reagents of a large manufacturer Sigma-Aldrich from Khim-med, its official dealer. It has many other official suppliers also operating in Russia, and their reagent prices are roughly the same. The cost of all expendables in European and U.S. catalogues is one and a half or two times lower than that of the same items in Russian catalogues. The same is true for specialised equipment, for instance, the Bruker spectrometers.

Buying equipment from abroad is extremely complex, so we never do it ourselves. Several times, however, we did buy directly through partner companies. For example, we were extremely lucky to buy a second hand Agilent chromatograph in the U.S. in excellent condition. It cost us just 1 million roubles, including shipping. If we had bought a new device from an official dealer in Moscow, it would have cost us 5 million roubles."

At the same time, there are cases when the company simply cannot buy products directly from abroad. Often companies have no contacts with the foreign manufacturer or no money to complete a rather sophisticated process of buying expensive foreign goods. ("We would gladly buy reagents in the U.S., but we have no contacts with local laboratories.")

The worst case is when the foreign manufacturer redirects all requests from customers to its official distributor in the Russian market.

The worst case is when the foreign manufacturer redirects all requests from customers to its official distributor in the Russian market. ("We tried to buy a network analyser from the U.S. Agilent; it is twice as cheap in the States as it is in Russia, but we are only allowed to deal with their official dealer in Russia.")

A representative of a laboratory of the Gubkin Russian State University of Oil and Gas:

"We had to deal with situations when the foreign manufacturer refused to sell its equipment directly and redirected us to an official dealer. This was the case, for example, with an expensive unique Ocean Optics spectrometer: it cost us one and a half times more to buy the device via the official dealer than directly import it from abroad.

According to my calculations, the average mark-up on goods imported to Russia is 50%. We have to accept such costs. If the product is especially rare, then we have to put up with 70% or 100% premiums.

Reagents are another issue. Apart from the fact that we pay an extra price for them, the shipping time is also very long: 1 to 3 months. Dealers do not deliver each order separately, but wait for a certain batch to accumulate. So when you place an order for a reagent, it is always a wild guess: if you are lucky to be in time for the completion of a batch, they will deliver fast, otherwise you risk waiting for several months."

Moreover, both direct purchases from abroad (particularly forced direct purchases) and purchases from official dealers are aggravated by a whole range of further organisational and process challenges that include:

- Customs problems (delays, red tape, corruption, high charges). Some biomedical companies noted that long customs clearance and inappropriate storage result in spoiled chemicals. ("I cannot imagine how we would cope with it, but for the customs preferences of Skolkovo");

- Long shipping time. Many innovative start-ups highlighted this issue ("How we can speak of competitiveness of innovative business, if we have to wait for half a year to get an order. My friends from U.S. laboratories receive the necessary reagents the next day after the order is placed.")

Higher prices, a limited product range, and lower quality of goods distributed by official distributors: most respondents confirmed these three issues that researchers and experts historically link to the prohibition of parallel imports. Many expressed explicit concerns about delays in the release of technological innovations in the Russian market and problems with after-sale service.

Higher prices, a limited product range, and lower quality of goods distributed by official distributors: most respondents confirmed these three

issues that researchers and experts historically link to the prohibition of parallel imports.

Higher prices turn out to be especially characteristic of three broad categories of products:

- Electronics, its components, power metering equipment and software ("Electronic components of Samsung are marketed in Russia via a single distributor. We suffer from high prices and lack of flexibility"; "Prices for micro controllers, boards and other electronic components of various foreign manufacturers are twice as high as their original price"; "Buying Comsol software in the Czech Republic proved to be twice as cheap as in Moscow");
- Electric devices and power equipment ("Prices for frequency converters for electric devices and plate heat exchangers that we need for our business are very high in Russia");
- Chemical and biological reagents, laboratory equipment: meters, centrifuges, refrigerators ("If we order chemicals and equipment in Russia rather than from abroad, the prices are guaranteed to be twice as high").

Speaking of higher prices, it should be noted that Russian prices are higher than the price for identical products charged abroad subject to shipping costs, customs clearance and related taxes and duties.

"TRIzol® produced by U.S. Invitrogen and required for laboratory experiments is supplied to Russia by its official distributor Helicon. The cost per 100 mL of the product on the U.S. web-site of Invitrogen is USD 164. The price of the same amount of the reagent shown on the distributor's web-site is USD 559."

A representative of a participant of the Skolkovo project engaged in the manufacturing of dosing devices for the chemical and healthcare industries:

"For our operations, we need to buy two unique and expensive machines: a super-finishing machine and a honing machine made by U.S. Sunnen. Their official representation in Russia, OOO Sunnen, purchases machines in the U.S., then supplies them to Switzerland, and then we may order the equipment from Switzerland to Russia. The price accumulates too many costs and becomes very unattractive. As a result, we decided to buy the machines directly from the manufacturer. Each machine costs 16 million roubles, including shipping. If we had ordered them from the official representative, this would have cost us one and a half or two times more."

Many IT companies complain about delays in the release of technological innovations and the limited choice of products in the Russian market caused by deliberate policies of foreign manufacturers. This industry is often particularly sensitive to delays in the official release of a product in Russia. ("It is critical for a mobile software developer to release applications as soon as possible once a device is launched in the market. In Russia, many mobile devices, for instance, made by Apple, are released with a significant delay, and some, such as AppleTV, GoogleTV, Blackberry Playbook, Barnes & Noble Nook Tablet, Amazon Kindle Fire, are not even officially present.")

A representative of an IT company participating in the Skolkovo project:

"It would seem to be a very simple thing: buying batteries for UPS power supply units in an office. But you cannot buy separate batteries for such units in Russia: dealers do not supply them. A Californian vendor operating via eBay is the only available shop that offers the batteries I need."

These imbalances have both explicit and implicit effects that are not fully perceived by businesspeople themselves as coming from the indirect impact of the regional exhaustion regime existing in Russia.

Some companies indicate issues with after-sale service: if equipment is bought directly from abroad, bypassing the official dealer in Russia, then later the dealer may refuse to help with installing and setting up such equipment. Service infrastructure is often unavailable.

These imbalances have both explicit and implicit effects that are not fully perceived by businesspeople themselves as coming from the indirect impact of the regional exhaustion regime existing in Russia. The explicit effects arise when businesspeople face direct restrictions and discrimination in terms of the price, product range, quality and level of after-sale service when buying products.

The first effect of the reverse side of the exhaustion regime existing in Russia consists in the forced purchase of imported products in Russia at higher prices.

The first effect of the reverse side of the exhaustion regime existing in Russia consists in the forced purchase of imported products in Russia at higher prices. Many businesspeople note that we must differentiate between purchases of unbranded expendables from Chinese manufacturers and branded products from Europe/the U.S. It is easier and cheaper to buy Chinese products directly: they cost much less than their branded peers and are more attractive cost-wise, even including shipping costs and customs duties. It is possible to order Chinese products from Russian distributors, but ordering directly from the foreign manufacturer is much cheaper. A Chinese product, however, is not always compliant with the necessary quality standards. "*I was buying FT232RL circuits. The seller assured that they were new original products by the FTDI manufacturer. The lowest price per circuit in Russia is USD 3, and here we speak of the minimum wholesale price. Chinese products cost USD 1.6 per*

unit. But my joy was short-lived: 20 of the 32 devices I had time to check did not work." As a result, companies have to recur to official "branded" products that often can only be bought from the official Russian distributor, as the manufacturer would simply refuse to sell the product directly.

A representative of a company participating in the Skolkovo project engaged in the development and manufacturing of electronic devices and components:

"To manufacture models using mobile processors by Samsung we are purchasing large quantities of electronic assemblies SC54412ACA-A040 from MT-System in Saint Petersburg. The assembly comprises two Samsung micro circuits. It costs us 1,620 roubles, including all taxes, which is, according to our estimates, twice as high as the cost of similar foreign components. We manufacture sophisticated equipment that must be very reliable and of very high quality. As such, we only need "branded" components of Samsung, and the only way for us to buy them is via an official dealer.

We simply do not consider options for buying such components from independent importers because we would lose technical support from the manufacturer."

It should be highlighted that it is not always that the official distributor marks up the price as high as possible to make abnormal profits: under the contract with the foreign manufacturer the distributor already buys products at higher prices, while the distribution mark-up proves to be insignificant. E.g. Helicon, the official distributor of chemical reagents made by U.S. manufacturer Invitrogen, has to order products in Europe at a purchase price 1.5 or 2 times higher than the price of such reagents in the U.S. Businesspeople themselves note: "The difference in prices for expendables puts us in a very disadvantageous situation, which has long-ranging implications. Quite naturally, the high cost of components increases the cost of products manufactured in Russia and makes the competition against China very challenging."

To be competitive in the global market, Russian innovative businesses must not only keep up with, but lead the market. It is hard to have such plans if the latest products are not even present in Russia or are officially released half a year later.

Another explicit effect consists in the limited choice of products or a delay in their release in the Russian market as compared to other countries in line with the policy applied by the foreign manufacturer. To be competitive in the global market, Russian innovative businesses must not only keep up with, but lead the market. It is hard to have such plans if the latest products are not even present in Russia or are officially released half a year later. This issue is especially important for IT companies where innovations are implemented in no time.

Third explicit effect is the lack of proper technical support and after-sale service of products purchased directly abroad or from an independent dealer.

Third explicit effect is the lack of proper technical support and after-sale service of products purchased directly abroad or from an independent dealer. For sophisticated devices and rare equipment, on-going consultations with representatives of the manufacturer, equipment setup, initial briefing of the personnel, and after-sale service prove critical. For this very reason, the absolute majority do not approach parallel importers even if such offers exist in the market: companies do not want to lose after-sale service support. If companies still dare to buy products from abroad or from independent importers, they often find that equipment manuals are not localised for Russia. As a result, it is hard for them to ensure correct and efficient operation of the equipment.

The end consumer who has bought a "grey" iPad online will be advised by a friend to approach, if it's broken, either an official service centre of Apple, or one of many repair shops that will fix the device. The innovative company that purchases equipment in single quantities and is responsible for the entire operating process cannot afford such a luxury: as a rule, the only choice is to address the official dealer.

We have also identified two consequences that undermine the efficient and successful performance of innovative businesses indirectly caused by the prohibition of parallel imports.

The entire staff of a small company , including its CEO, often has to abandon all other affairs to handle the equipment procurement and customs clearance process for several months.

1. To save money and overcome the discriminatory pricing policy of official distributors, companies purchase the products they need directly from abroad. Transaction costs in such case prove very high: starting from the complex negotiations and drafting of agreements, and ending with the customs "red tape." ("The foreign manufacturer did not believe that anything could be created in Russia and refused to sign a contract with us"; "Few manufacturers are willing to deal with start-ups"). The entire staff of a small company, including its CEO, often has to abandon all other affairs to handle the equipment procurement and customs clearance process for several months. It would be fair to note that the country's imperfect customs system also plays a certain part here.

Long shipping time is a very sore subject for all businesspeople.

2. Long shipping time is a very sore subject for all businesspeople. This issue is also connected to parallel imports. The official distributor will stock up only on goods that are in the highest demand, while rarer orders would always be handled on a case-by-case basis: the distributor will place an order with the official manufacturer and only then starts the delivery process, which may take several months. As a result,

businesspeople become hostages to the marketing strategy of the dealer and the foreign manufacturer.

In general, we can conclude that the regional exhaustion regime existing in Russia puts a drag on the development of the national innovative sector.

In general, we can conclude that the regional exhaustion regime existing in Russia puts a drag on the development of the national innovative sector. Its impact on smaller innovative companies is absolutely identical to the national exhaustion regime as goods required for the operation of knowledge-intensive companies are imported from non-C.I.S. countries rather than from Kazakhstan or Belarus.

The results of our sociological study demonstrate that the prohibition of parallel imports of goods (and the resulting "monopoly" on channels through which foreign products are supplied) has considerable direct and indirect effects on the day-to-day operation of small- and medium-size innovative companies. Sometimes, ignoring the essence of parallel import prohibition, businesspeople themselves do not fully realise how much this situation has to do with all the troubles they face when buying foreign products. Entrepreneurs have to pay high prices for materials and equipment, put up with product range discrimination and lack of proper after-sale support, and waste a lot of time filling in documents and transporting goods across the border. On a national scale, this situation creates an adverse environment for the operation of small- and medium-size innovative companies, and impairs performance and competitiveness of such companies in the global market.

References

References

Adams v. Burke, 84 US 17 Wall. 453 (1878) http://supreme.justia.com/cases/federal/us/84/453/case.html.

Barfield C and Groombridge M, 'Parallel Trade in the Pharmaceutical Industry: Implications for Innovation, Consumer Welfare and Health Policy' (1999) 12 Fordham Intellectual Property, Media & Entertainment Law Journal 185-265.

Bobbs-Merrill Co v. Straus 210 US 339 (1908) http:// supreme.justia.com/cases/federal/us/210/339.

Danzon P and Epstein A, 'Effects of Regulation on Drug Launch and Pricing in Interdependent Markets' (2008) NBER Working Paper No 14 041.

Danzon P and Furukawa M, 'Prices and Availibility of Pharmaceuticals: Evidence from Nine Countries' (2003) 29 Health Affairs 521-536 http:/content. healthaffairs.org/cgi/content/full/hlthaff.w3.521v1/DC1.

Enemark U and Pedersen K M, Parallel Imports of Pharmaceuticals in Denmark, Germany, Sweden and the UK, 2004-2009: An analysis of savings (Odense: University of Southern Denmark, 2011).

Eren-Vural I, 'Domestic Contours of Global Regulation: Understanding the Policy Changes on Pharamaceutical Patents in India and Turkey' (2007) 14 Review of International Political Economy 105-142.

European Commission Decision for Cases: IV/36.957/F3 Glaxo Wellcome (notification), IV/36.997/F3 Aseprofar and Fedifar (complaint), IV/37.121/F3 Spain Pharma (complaint), IV/37.138/F3 BAI (complaint), IV/37.380/F3 EAEPC (complaint) Official Journal of the European Communities, Article L302/1 http://eur-lex.europa.eu/LexUriServ/ LexUriServ.do?uri=OJ:l:2001:302:0001:0043: en: PDF.

Fisher W and Syed T, 'Infection: The Health Crisis in the Developing World and What We Should Do about It' Stanford University Press http://cyber.law.harvard.edu/people/ tfisher/Infection.htm).

Ganslandt M and Markus K, 'Parallel Imports and the Pricing of Pharmaceutical Products: Eviddence from the European Union' (2005) 23 Journal of Health Economics 1,035-1,057.

Goldberg P, 'Alfred Marshall Lecture Intellectual Property Rights Protection in Developing Countries: The Case of Pharmaceuticals' (2010) 8 Journal of the European Economic Association. MIT Press 326-353.

Heath C, 'Parallel Imports and International Trade' (WIPO Report presented at the Annual Meeting of the International Association for the Advancement of Teaching and Research in Intellectual Property at the headquarters of WIPO in Geneva, July 7-9, 1999) http://www.wipo.int/sme/en/ ip_business/ export/international_exhaustion.htm.

Hellerstein R, 'Do Drug Prices Vary Across Rich and Poor Countries?' (2003) Social Science Research Council Publication 29.

Fink C and Markus K (eds), Intellectual Property and Developement: Lessons from Recent Economic Research (Washington, DC: World Bank and Oxford University Press, 2005).

Jack Walters & Sons Corp. v. Morton Building, Inc., 737 F.2d 698, 704 (7th Cir. 1984).

Kanavos P, Costa-i-Font J, Merkur S, Gemmill M, The Economic Impact of Pharmaceutical Parallel Trade in European Union Member States: A Stakeholder Analysis (London School of Economics and Political Science, 2004).

Kanavos P and Holmes P, Pharmaceutical Parallel Trade in the UK (London Civitas: the Institute for the Study of Civil Society, 2005).

Li C and Maskus K, 'The Impact of Parallel Imports on Investments in Cost-Reducing Research and Development' (2006) 68 Journal of International Economics 443-455.

Li C and Robles J, 'Product Innovation and Parallel Trade' (2007) 25 International Journal of Industrial Organization 417-429.

MacGillivray R, ' Parallel Importation: A Framework for a Canadian Position on Exhaustion of Intellectual Property Rights' SJD Thesis (University of Toronto, Faculty of Law, 2008).

Maskus K and Chen Y, 'Vertical Price Control and Parallel Imports: Theory and Evidence' (2004) 12 Review of International Economics 551-557.

Papadopoulos T, 'Copyright, Parallel Imports and National Welfare: The Australian Market for Sound Recordings' (2000) 33 The Australian Economic Review 337-348.

Porter M, 'How Competitive Forces Shape Strategy' (March-April 1979) Harvard Business Review 137-145.

Australian Government Productivity Commission, Restrictions on the Parallel Importation of Books: Productivity Commission Research Paper (2009).

Richardson M, 'An Elementary Proposition Concerning Parallel Imports' (January, 2002) 56 Journal of International Economics 233-245.

Stiglitz J, Whither Socialism? (Cambridge and London: MIT Press, 1989).

Stothers C, Parallel Trade in Europe: Intellectual Property, Competition and Regulation Law. (Hart Publishing, 2007).

Supap Kirtsaeng, DBA Bluechristine99, Petitioner v. John Wiley & Sons, Inc. Supreme Court of the United States Decision. 19 March 2013.

The Set of Multilaterally Agreed Equitable Principles and Rules for the Control of Restrictive Business Practices (first adopted by the General Assembly on Dec. 5, 1980 and reviewed in 1985, 1990, 1995 and 2000 respectively). Sec. D (4) (e). http://r0.unctad.org/en/subsites/cpolicy/docs/ CPSet/ cpset.htm.

Valletti T and Szymanski S, 'Parallel Trade, International Exhaustion and Intellectual Property Rights: A Welfare Analysis' (2005) CERP Discussion Papers. No 5 022.

West P and Mahon J, 'Benefits to Payers and Patients from Parallel Trade' (2003) York Health Economics Consortium.

Wilson T, Unbinding Book Barrier: Why Australia Should Scrap Parallel Import Restrictions on Books.' (Institute of Public Affairs, 2009)

WTO Working Group on the Interaction between Trade and Competition Policy Report to the General Council Section 120. https://docs.wto.org/dol2fe/Pages/FE_Search/ FE_S_ S006–1.aspx? Id=19500& IsNotification=False.

Dozortsev V A (ed), Intellectual Rights: Notion. System. Codification Objectives. A compliation of articles/ Private Law Research Centre. (M: Statut, 2003).

Zalik Y (ed), Report by the Public Commission for Development of Competition in the Automobile Industry as Ordered by the Israel Ministry of Transport, National Infrastructures and Road Safety (2012).

Semenov A V, 'Intellectual amendments to the Civil Code - children of compromise and practicability' Speech at the 13-th Practical conference of the 'Intellectual property' series (20 March 2013).

https://forum.china-iphone.ru.

https://forum.xumuk.ru.

http://chemport.ru/forum.

https://habrahabr.ru.

https://chemistlab.ru/forum.

New Challenges in the Intersection of Intellectual Property Rights with Competition Law – A View from Europe and the United States

New Challenges in the Intersection of Intellectual Property Rights with Competition Law – A View from Europe and the United States

Review

Ioannis Lianos

University College of London
Faculty of Laws, Reader.
Centre for Law, Economics
& Society, Director.
Doctor of Philosophy

Rochelle Dreyfuss

New York University School
of Law, Pauline Newman
Professor of Law.
Engelberg Centre on Innovation
Law and Policy, Co-director

* The authors would like to thank Ms Despoina Mantzari (UCL) for her excellent research assistance. The authors would also like to thank Clare Boucher, Tony Clayton and Sir Robin Jacob for interesting discussions.
Of course the views expressed in this article and any errors are of the exclusive responsibility of the authors.

Challenges in the Interaction of Intellectual Property Rights and Competition (Antitrust) Law

In recent years many countries have engaged in serious reexaminations of legal regimes they use to support innovation. In part, the establishment of the World Trade Organization and its adoption of the Trade Related Aspects of Intellectual Property Law (TRIPS) Agreement have necessitated the revision of most national intellectual property laws.[1] Also, in part, new economic theories have driven a reassessment, particularly at the interface between competition law and intellectual property law. Mostly, however, the importance of knowledge products in modern global economy has focused attention on finding optimal methods to promote domestic intellectual production. This paper describes key trends with special attention to the EU and the United States and with a focus on patent rights.

The report starts with describing the innovation "eco-system" and the relation between different actors in the process. In theory, innovation begins "upstream" with fundamental scientific insights and moves "downstream" through the discovery of technical applications of these insights and the development of commercial embodiments and manufacturing techniques followed by arrangements for distribution, servicing and sales. Upstream research – basic science – may sometimes be too far removed from application and may require encouragement from outside sources, particularly the government. However, as economists now recognize, innovation is not in fact purely linear: downstream players may have fundamental insights and upstream scientists may contribute to the development of new prospects.[2] Accordingly, a mix of incentives is required at all stages in the innovative process. Certainly, robust competition functions as an "engine," driving industry to adapt advances, find applications, create new businesses and jobs, enhance productivity and improve social welfare. But intellectual property and competition (antitrust) laws are needed to facilitate the process. Intellectual property rights protect inventors and investors who sink effort and funds into development from free riders – those who would otherwise copy the advance and low cost and undercut the price charged by the original inventor. Competition law supplements intellectual property protection and also counterbalances it by safeguarding the public from right holders who might prevent follow-on innovation or otherwise impose excessive costs.

The complexity of the innovation process and many differences in business models employed in various sectors in the knowledge economy suggest that a variety of approaches to incentives must be taken, and the interaction between competition law and intellectual property law requires careful attention and tailoring. For example, the United States recognized the growing importance of bringing upstream and downstream innovators together by enacting the Bayh-Dole Act of 1982. The statute permits universities to own patent rights in the fruits of government-supported work[3] and brings academic scientists and industry in a closer alliance, thereby facilitating a greater interchange of ideas and information.[4] By the same token, the emerging shift from vertical integration to value chain licensing, in which every participant in the innovation process brings its own expertise to bear in taking ideas and turning them into marketplace products,[5] requires patent rights and intellectual property licenses to serve as a means for allocating rewards along the development path. As a result, competition law must give rights holders a high degree of flexibility in the manner in which they arrange their business dealings.[6] Parts II-IV of the report discuss how both intellectual property and competition law must be reconsidered in light of these developments.

Both intellectual property and antitrust law must also account for differences in the patterns of technological advance. As Richard Nelson and Robert Merges have noted, "at least four different generic models are needed. The first describes discrete invention. A second concerns "cumulative" technologies. Chemical technologies have special characteristics of their own. Finally, there are "science-based" technologies where technical advance is driven by developments in science outside the industry."[7] A "one size fits all" intellectual property system is therefore not appropriate. Specifically, because intellectual property law was first developed during the Industrial Revolution, it is largely based on stand-alone (discrete) mechanical inventions. Thus, it has few doctrines that permit one generation of innovators to "stand on the shoulders" of those who went

1 Agreement on Trade Related Aspects of Intellectual Property Rights, 15 Apr. 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments—Results of the Uruguay Round vol. 31, 33 I.L.M. 81 (1994) [hereinafter TRIPS Agreement].

2 See, e.g., Fiona Murray and Siobhan O'Mahony, 'Exploring the Foundations of Cumulative Innovation: Implications for Organization Science' (2007) 18 Organization Science 1006.

3 35 U.S.C. §§ 200-212.

4 Peter Lee, 'Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer' (2004) 100 California Law Review 1503.

5 Sean M O'Connor, 'IP Transactions as Facilitators of the Globalized Innovation Economy' in (Rochelle Dreyfuss, Diane L Zimmerman and Harry First, Working within the Boundaries of Intellectual Property-Innovation Policy for the Knowledge Society (Oxford University Press 2010) 203.

6 David J Teece, Gary Pisano and Amy Shuen, 'Dynamic Capabilities and Strategic Management' (1997) 18 Strategic Management Journal 509, 516; David J Teece, 'Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy (1986) 15 Research Policy 285.

7 Robert P Merges and Richard R Nelson, 'On the Complex Economics of Patent Scope' (1990) 90 Columbia Law Review 839, 880.

before.[8] As a result, it must be considerably revamped to deal with the incremental (cumulative) approach that characterizes much of the innovation occurring in the Knowledge Revolution. The emergence of the software and semiconductor sectors furnishes two examples. Similarly, change is necessary to make the law resonate better with a science-based sector such as biotechnology. Part II discusses the many opportunities (or as Dan Burk and Mark Lemley would put it, "levers") that can be used to tailor patent law to deal with these realities.[9] These include decisions on what constitutes protectable subject matter, the degree of inventiveness required to merit protection, the contours of the disclosure requirement, the analysis of infringement, the nature of exceptions and limitations to intellectual property rights and the remedies available. Furthermore, because patent law uses as its benchmark the knowledge of a person with ordinary skill in the art, it contains an inherent mechanism to calibrate the availability of protection to the maturity of the industry.

Classic intellectual property and innovation laws were developed with a single jurisdiction in mind. As borders have become more permeable, capital, firms and expertise migrate to jurisdictions with the most favorable conditions.[10] Indeed, the promulgation of the TRIPS Agreement within the World Trade Organization is testament to this change. Part II describes the ways in which countries have started to alter patent law to reflect the global nature of the innovation enterprise, and Part IV discusses the problem of parallel imports and the exhaustion rules necessary in light of the global marketplace for innovative products, the special nature of certain of these products and the emergence of new business models. A variety of mechanisms – mostly outside of intellectual property and competition law and thus outside the scope of this paper – have also developed to stem the "brain drain" and even to repatriate the knowledge workers who have emigrated for education or job opportunities.

As Part III discusses, the increasing number of jurisdictions worldwide that have adopted competition law may complicate the global exploitation of intellectual property. Jurisdictions take divergent positions on how competition law intersects with intellectual property rights and there is no global competition law framework equivalent to the TRIPS Agreement. The report provides an illustration by focusing on a comparative analysis of how US antitrust law and EU competition law apply to the practices of rights holders and examines different theoretical frameworks and standards proposed for dealing with the interaction between intellectual property rights and competition laws. This Part also focuses on specific practices, including refusals to license, anticompetitive abuse of the process of procuring and exploiting intellectual property rights, patent pools and cross-licensing, standard setting and other forms of technology sharing, (F) RAND licensing obligations, joint ventures, patent ties, technological tying and package licensing, excessive royalties, resale price maintenance of goods protected by intellectual property rights, vertical territorial limitations and customer restrictions, and settlements of intellectual property disputes.

It has also become evident that intellectual property laws are not the sole determinants of innovation. Firms appropriate the benefits of inventiveness in a variety of ways; for many firms, patent law is low on the list of strategies. As a survey by Alan Hughes and Andrea Mina conducted in the United Kingdom shows, depending on the size of the firm, lead time advantage, along with methods to perpetuate that advantage through secrecy, is first on the list for many firms.[11] Thus, laws protecting trade secrets and enforcing confidentiality agreements can be as important as more formal intellectual property law.[12] Indeed, Edwin Mansfield's work suggests that the pharmaceutical sector is alone in relying principally on patent law to capture returns from innovation.[13] Once again, "a one-size-fits-all" system makes little sense, and Part II illustrates how patent law can be manipulated to deal with differences that arise from the technical field in which innovation is taking place, changes that occur as an industry matures and other variables.

Closely related to this observation is another one: it is increasingly recognized that a significant amount of innovation occurs in the absence of any mechanism to directly appropriate returns. So-called "open innovation" is spurred by a variety of factors, including curiosity, pleasure, the expectation of reputational benefits, professional advancement and prizes, and to obtain reciprocal benefits.[14] These systems do not, however, operate entirely outside the intellectual property realm. Rather, they are often supported by ancillary profit-based interests dependent on intellectual property rights. For example, IBM supports Linux, a free software platform, so that it has a freely-available base on which to run its proprietary programs. User groups may develop new products (such as research tools) through free exchange within their own communities, but once these products move to the commercial stage, intellectual property rights can be need-

8 See, e.g., Suzanne Scotchmer, 'Standing on the Shoulders of Giants: Protecting Cumulative Research and the Patent Law' (1991) 5 Journal of Economic Perspectives 29. The phrase, "standing of the shoulders of giants," derives from a letter Isaac Newton wrote to Robert Hooke, see Robert Andrews et al (eds), The Columbia World of Quotations No. 41418 (Columbia University Press 1996).

9 Dan L Burk and Mark A Lemley, The Patent Crisis and How Courts Can Solve it (University of Chicago Press 2009).

10 Pamela Samuelson, 'Intellectual Property Arbitrage: How Foreign Rules Can Affect Domestic Protections' (2004) 71 University of Chicago Law Review 223.

11 Alan Hughes and Andrea Mina 2010, The Impact of the Patent System on SMEs, A Report to the Strategic Advisory Board for Intellectual Property (SABIP) available at http://www.ipo.gov.uk/ipresearch-impact-201011.pdf accessed 28 April 2013.

12 See also Edwin Mansfield, 'R&D and Innovation: Some Empirical Findings' in Zvi Griliches (ed), R&D, Patents and Productivity, National Bureau of National Research (The University of Chicago Press 1984) 127.

13 Edwin Mansfield, 'Patents and Innovation: An Empirical Study' (1986) 32 Management Science 173. See generally Andrés López, 'Innovation and Appropriability, Empirical Evidence and Research Agenda' in The Economics of Innovation (WIPO 2009), available at <http://www.wipo.int/ip-development/en/economics/pdf/wo_1012_e_ch_1.pdf> accessed 28 April 2013.

14 See, e.g., Eric von Hippel, Democratizing Innovation (MIT Press 2005); Henry W Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology (Harvard Business School Press 2003); Katherine J Strandburg, 'Curiosity-Driven Research and University Technology Transfer' in Gary D Libecap (ed) (2005) 16 Advances in the Study of Entrepreneurship, Innovation and Economic Growth 97; Fiona Murray, et al, 'Of Mice and Academics: Examining the Effect of Openness on Innovation' (March 2009), NBER Working Paper Series, Vol. w14819, 2009, available at <http://ssrn.com/abstract=1369055> accessed 28 April 2013.

ed to promote further development. Thus far, no intellectual property or competition law regime has made adjustments that recognize the importance of open innovation. Accordingly, the sorts of necessary accommodations are mentioned only briefly in the sections that follow.[15]

The Need for a New Theoretical Framework

As Part III argues, the intersection between competition and intellectual property law gives rise to complex trade-offs between incentives to innovate and dissemination of innovation, static and dynamic efficiency, total welfare and the welfare of consumers. It also requires difficult choices between rules and standards: general rules versus rules drawn to specific intellectual property regimes and between ex ante versus ex post approaches. Furthermore, the interaction has led to an effort to reconceptualize both intellectual property and competition law with greater focus on economics. While the day-to-day activity of intellectual property offices and courts interpreting, and delimiting the boundaries of intellectual property protection rarely takes this approach, empiricists have increasingly examined the real-world impact of intellectual property rights (particularly patent rights) on innovation and welfare.[16] Starting with this emerging perspective, the dialectical relation between these two disciplines has created an opportunity to reconsider the narrative which has long supported this area of law, that intellectual property rights are equivalent (or at least analogous) to property rights.

The transformation in the legal and economic literature on property rules and liability rules is especially apparent in the rules, developed on compulsory licenses which substitute royalties for rights to exclude.[17] In fact, property rules and liability rules form a continuum: "when an innovator is forced to license its innovative technology; the protection afforded to him degrades from a property rule to a liability rule."[18] The emphasis on the cumulative nature of innovation contributes to the reconceptualization of intellectual property rights along this spectrum. More importantly, the opposition between property rules and liability rules may provide a unifying theoretical framework for the analysis of the effects of different forms of intellectual property protection. At one side of the continuum, patents allow right holders to exclude imitators and duplicators and even to enjoin independent inventors from using and commercializing the protected invention. At the other side, trade secrets do not protect the inventors against independent discovery or duplication through reverse engineering; copyright protects the expression of an idea, hence, does not exclude the parallel development of an invention. It may, however, "put restrictions on reverse engineering ("circumvention of digital locks")."[19]

One way to deal with the complexity of the innovation process and with differences in the patterns of technological development is to address intellectual property law as a form of regulation: these rights impose obligations on third parties, not as a consequence of a contract, tort or voluntary exchange, but because of the direct intervention of the government which aims to stimulate particular activities in order to foster the general welfare.[20] By conferring property rights on information products, the government not only seeks to facilitate market transactions, as is the case for physical property rights, but also to correct a market failure caused by free riding. Taking a regulatory perspective enables us to conceptualize the interaction between competition law and intellectual property as a dimension of the relation between government activity and competition.

The intersection of intellectual property law with competition law has also led to a re-examination of competition law's traditional focus on static allocative efficiency. Dynamic analysis has made inroads into merger analysis and is increasingly considered as essential also for the competition law assessment of unilateral conduct, at least theoretically. Practically, however, there are few instances competition law has incorporated systematically: dynamic analysis and the focus on dynamic efficiency. There are many reasons for this. First, from an institutional perspective, courts are not in a position to conduct

15 For further discussion, see Rochelle C Dreyfuss, 'Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm' (2010) 31 Cardozo Law Review 1437.

16 See, for instance, Michele Boldrin and David K Levine, 'The Case Against Patents' (September 2012) Federal Reserve Bank of St Louis Working Paper 2012-035A available at <http://www.research.stlouisfed.org/wp/2012/2012-035.pdf> accessed 28 April 2013; James Bessen and Michael J Meurer, Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk (Princeton University Press 2009); Dominique Guellec and Bruno van Pottelsberghe de la Potterie, The Economics of the European Patent System (Oxford University Press 2007); Adam B Jaffe and Josh Lerner, Innovation and its Discontents: How our Broken Patent System is Endangering Innovation and Progress, and What to Do About it (Princeton University Press 2004); Suzanne Scrothcmer, Innovation and Incentives (MIT Press 2004).

17 Guido Calabresi and A Douglas Melamed, 'Property Rules, Liability Rules and Inalielability: One View of the Cathedral' (1972) 85(6) Harvard Law Review 1089; Mark A Lemley and Phil Weiser, 'Should Property or Liability Rules Govern Information?' (2007) 85 Texas Law Review 783.

18 Vincenzo Denicolò and Luigi Alberto Franzoni, 'Rewarding Innovation Efficiently: The case for Exclusive IP Rights, in Geoffrey A Manne and Joshua D Wright (eds) Regulating Innovation: Competition Policy and Patent Law under Uncertainty: Regulating Innovation (Cambridge University Press 2011) 287, 289.

19 Ibid 290.

20 See, for instance, Ioannis Lianos, 'Competition Law and Intellectual Property Rights: Is the Property Rights' Approach Right?' in John Bell and Claire Kilpatrick (eds) 8 The Cambridge Yearbook of European Legal Studies (Hart Publishing 2006) 153.

the sophisticated analysis required. They are limited to the evidence and issues raised by the parties; these may (or may not) include the effect of the specific practice on consumers in related relevant markets, future generations of consumers or the general public. Competition authorities, the dominant enforcement actor in Europe, are better placed to conduct this type of complex polycentric economic analysis. They can avail themselves of in-house economic expertise, and they enjoy the power to investigate different sectors of the economy (through sector inquiries). Their intervention as amicus curiae in intellectual property litigation may, however, provide an effective way to influence the adjudication process and create a more competition-friendly approach within intellectual property law (for example, through the doctrine of patent misuse).

Second, from a substantive perspective, competition authorities do not have the means, tools or time to conduct systematic dynamic competitive analyses on a case-by-case basis. Authorities operate in an adjudicatory context with strict deadlines and a limited timeline for making decisions. Dynamic analysis is occasionally added after the competition authority has completed a static analysis, but it is not incorporated directly in their economic analysis of the competitive situation at the outset. Nor can competition authorities deal with the network effects that characterize the "new economy", and which can combine with intellectual property rights to harm consumers and ultimately innovation. Finally, the tools of dynamic and static efficiency analysis are not widespread among competition authorities, and the data required for doing a more sophisticated analysis are unavailable in most cases.

Presumptions and rules on inferences, applying in competition and intellectual property law analyses, operate as a second best. They are less costly but more prone to errors. However, they offer an alternative to the extended and complex dynamic economic analysis that the current institutional settings are not ready to provide.

Governance

This discussion highlights not only the importance of intellectual property and competition law, but also the need for a governance system that stays abreast of technological, economic and social developments, and which is steeped in the economic literature. Part V examines institutional design and highlights the regulatory choices that are available to optimize innovation law and policy. This Part also suggests that changes in governance are emerging, that permit better recourse to economic thinking, to a greater appreciation of intellectual property as a form of regulation, and lead to a better interaction between competition and intellectual property law. Thus, the role of the offices that deal with intellectual property may soon change. Instead of performing merely ministerial tasks, such as registering trademarks or determining whether inventions meet the conditions of patentability (such novelty, usefulness, and inventiveness), they may become more proactive and assume responsibilities for forecasting, knowledge gathering, information sharing, and determining the effects of the intellectual property system on economic efficiency, welfare and innovation. Recent moves to establish economic units and scientific advisory boards within the intellectual property authorities illustrate this gradual transformation from a bureaucracy towards a regulatory agency. With this evolution, these offices will likely enjoy a more dominant role in interpreting intellectual property law, applying it to the new technologies, and developing a frame for analyzing and proposing intellectual property doctrine.

A regulatory approach can also emerge from changes in the way intellectual property offices operate. As illustrated by recent reforms in US patent law, the institution of post-grant review procedures and other new avenues for challenging patents increase the adjudicatory powers of the USPTO. Ex post challenges extend the Office's horizons, allowing it to better appreciate the exclusionary effect of patents and their impact on competition. Moreover, as the discussions over vesting the USPTO with substantive rule-making authority show, patent offices may become the hub of an innovation-centred regulatory nexus, comprising competition authorities, sector specific regulators (e.g. telecom regulator), the food and drug administration among others, with the aim of developing a coherent innovation policy that employs all the legal instruments at the disposal of the state, in order to promote innovation to the benefit of consumers and society at large.[21]

Collaboration among intellectual property offices and other agencies, within the innovation regulatory nexus, may also enhance a more systematic consideration of dynamic efficiency concerns in competition law analysis. In particular, if intellectual property offices were to conduct periodic empirical and economic analyses on the effect of patents on the level of innovation in various industries, subsequent discussions among agencies based on a common evidence base between could feed into rulemaking and adjudicatory process, and ensure the congruence of their action.

21 See, e.g., Arti K Rai, 'Patent Validity Across the Executive Branch: Ex Ante Foundations for Policy Development' (2012) 61 Duke Law Journal 1237.

NEW CHALLENGES IN THE INTERSECTION OF INTELLECTUAL PROPERTY RIGHTS WITH COMPETITION LAW – A VIEW FROM EUROPE AND THE UNITED STATES

NEW CHALLENGES IN THE INTERSECTION OF INTELLECTUAL PROPERTY RIGHTS WITH COMPETITION LAW – A VIEW FROM EUROPE AND THE UNITED STATES

Ioannis Lianos

University College of London
Faculty of Laws, Reader.
Centre for Law, Economics
& Society, Director.
Doctor of Philosophy

Rochelle Dreyfuss

New York University School
of Law, Pauline Newman
Professor of Law.
Engelberg Centre on Innovation
Law and Policy, Co-director

I. INTRODUCTION

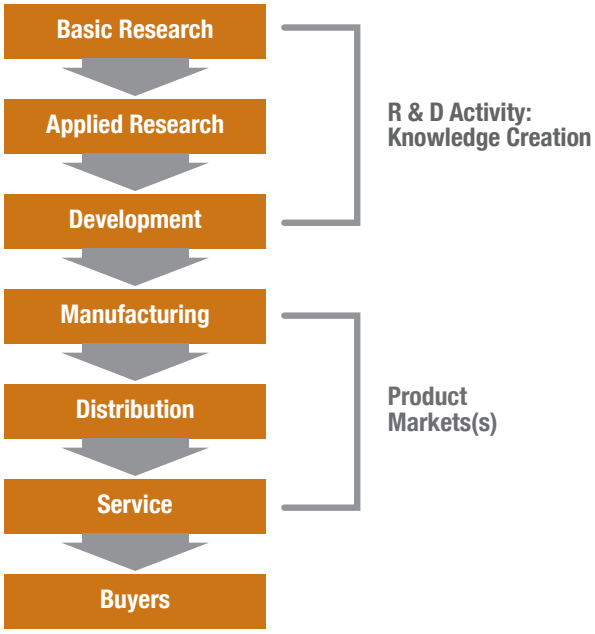
In recent years many countries have engaged in serious reexaminations of the legal regimes they use to support innovation. In part, the establishment of the World Trade Organization and its adoption of the Trade Related Aspects of Intellectual Property Law (TRIPS) Agreement has necessitated revision of most national intellectual property laws.[1] In part, new economic theories have driven a reassessment, particularly at the interface between competition law and intellectual property law. Mostly, however, the importance of knowledge products in the modern global economy has focused attention on finding optimal methods to promote domestic intellectual production. This paper describes key trends, with special attention to the EU and the United States, and with a focus on patent rights.

Developments in the United States demonstrate the need for reexamination. In that country, encouraging technological growth has been a longstanding interest. Thomas Jefferson was an inventor and took a personal interest in the patent system.[2] Many scientific institutions were established in the first century of the Nation's existence – the Smithsonian Institute and the American Association for the Advancement of Science in 1850; the National Academy of Sciences and the Department of Agriculture in 1862. In 1862 and 1890, the Morrill Acts gave birth to the land-grant college system, which concentrated on innovation in agriculture, science, and engineering.[3] Indeed, because technology – advances in aviation, radar, encryption, medicine, and nuclear energy – was considered so important to winning World War II, President Roosevelt asked Vannevar Bush, his science advisor, to create a technology plan for the post-war period.[4]

The strategy Bush developed was centered on a linear theory: he thought innovation began "upstream", with fundamental scientific insights, and moved "downstream" through the discovery of technical applications of these insights, the development of commercial embodiments and manufacturing techniques, followed by arrangements for distribution, servicing, and sales. In Bush's view, upstream research – basic science – was too far removed from application to be an attractive target for commercial investment. At the same time, however, he saw this work as the wellspring from which multiple technological prospects flow. To assure continuing support for basic science, he recommended – and the U.S. Government pursued – a mixed program of intramural research within Government laboratories and Government funding of extramural research in universities and other nonprofit organizations.[5]

The expectation was that robust competition would function as an "engine," driving industry to adapt the advances, find applications, create new businesses and jobs, enhance productivity, and improve social welfare.[6] Intellectual property and competition (antitrust) laws would facilitate the process. Intellectual property rights would protect inventors and investors who sunk effort and funds into development from free riders – those who would otherwise copy the advance and low cost, and undercut the price charged by the original inventor. (There are other justifications for intellectual property rights, but US law has largely been based on this utilitarian approach).[7] Competition law would supplement intellectual property protection and would also counterbalance it by safeguarding the public from right holders who might otherwise prevent follow-on innovation or otherwise impose excessive costs.

Figure 1[8]



To a large extent, this construct still characterizes the innovation policy landscape. As Part II of this paper recounts, patents are available in all fields of technology. However, patentable subject matter is defined in a manner that withholds protection for advances, such as the discovery of principles of science (for example, E = mc2, the fundamental relationship between energy and mass), that are so generative, ap-

1 Agreement on Trade Related Aspects of Intellectual Property Rights, 15 Apr. 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments – Results of the Uruguay Round vol. 31, 33 I.L.M. 81 (1994) [hereinafter TRIPS Agreement].

2 Graham v John Deere Co 383 US 1 (1966).

3 Diana Rhoten and Woody W Powell, 'Public Research Universities: From Land Grant to Federal Grant to Patent Grant Institutions' in Diana Rhoten and Craig J Calhoun (eds), Knowledge Matters (Columbia University Press 2010) 315.

4 Vannevar Bush, 'Science- The Endless Frontier: A Report to the President On A Program for Postwar Scientific Research' (United States Government Printing Office, 1945).

5 See National Research Council of the National Academies, Committee on Management of University Intellectual Property, Lessons from a Generation of Experience, Research and Dialogue, 'Managing University Intellectual Property in the Public Interest' (The National Academy Press 2010) 69–70.

6 Joseph A Schumpeter, The Theory of Economic Development (London, Transaction Pub 2005, first published by Harvard University Press in 1934) and Capitalism, Socialism and Democracy (1942, published by Harper & Bros. in 1950).

7 See, e.g., Brad Sherman and Lionel Bently, The Making of Modern Intellectual Property Law (Cambridge University Press 1999) 14–24 (considering the shift from occupancy to mental labour as the source of property right provided the first form of justification for instituting property rights on ideas); Kenneth W Dam, 'The Economic Underpinnings of Patent Law' (1994) 23 Journal of Legal Studies 247; F M Scherer, 'The Innovation Lottery' in Rochelle C Dreyfuss, Harry First and Diane L Zimmerman (eds), Expanding the Boundaries of Intellectual Property (Oxford University Press 2001) 3; Edmund W Kitch, 'The Nature and Function of the Patent System' (1977) 20 Journal of Law and Economics 265 (proposing a "mining claim" or "prospecting theory, more fully described below).

8 Jansuz A Ordover, 'Economic Foundations and Considerations in Protecting Industrial and Intellectual Property' (1984) 53 (3) Antitrust Law Journal 503, 515.

plications are best developed competitively. Furthermore, rights are cabined by exceptions and limitations (such as research exceptions) that facilitate further research and competitive development downstream. And as Part III shows, there is a set of rules at the intersection between intellectual property law and competition law that are crafted to protect follow-on innovation and a competitive market place for technological products (and in some cases, for technological opportunities).

That said, it has become clear that the Bush model and the laws that flowed from it do not capture many important aspects of the innovation process. First, modern economists have questioned the linearity of innovation. Fundamental insights are not the exclusive domain of scientists. In fact, downstream players can have a significant role in identifying new prospects and finding commercial opportunities for their use. Conversely, upstream inventors are sometimes in the best position to guide the further development of fundamental insights.[9] Thus, for example, in 1982, the United States enacted the Bayh-Dole Act in order to permit universities to own patent rights in the fruits of government-supported work.[10] The enactment was largely intended to bring scientists and industry in closer alliance and facilitate greater interchange of ideas and information.[11] Similarly, the emerging shift from vertical integration to value chain licensing recognizes that every participant in the innovation process brings its own expertise to bear in taking ideas and turning them into marketplace products.[12] Since intellectual property licenses serve to allocate rewards along the development path, rights holders require a high degree of flexibility in the manner in which they arrange their business dealings.[13] As Parts III and IV demonstrate, both intellectual property and competition law must be reconsidered in light of these developments.

Second, it has become evident that the pattern of technological advance is not the same in all fields. As Richard Nelson and Robert Merges have noted, 'at least four different generic models are needed. The first describes discrete invention. A second concerns "cumulative" technologies. Chemical technologies have special characteristics of their own. Finally, there are "science-based" technologies where technical advance is driven by developments in science outside the industry'.[14] A "one size fits all" intellectual property system is therefore not appropriate. Specifically, because intellectual property law was first developed during the Industrial Revolution, it is largely based on stand-alone (discrete) mechanical inventions. Thus, it has few doctrines that permit one generation of innovators to "stand on the shoulders" of those who went before.[15] As a result, it must be considerably revamped to deal with the incremental (cumulative) approach that characterizes much of the innovation occurring in the Knowledge Revolution. The emergence of the software and semiconductor sectors furnishes two examples. Similarly, change is necessary to make the law resonate better with a science-based sector such as biotechnology. Part II discusses the many opportunities (or as Dan Burk and Mark Lemley would put it, "levers") that can be used to tailor patent law to deal with these realities.[16]

Third, classic intellectual property and innovation laws were developed with a single jurisdiction in mind. As borders have become more permeable, capital, firms, and expertise migrate to jurisdictions with the most favorable conditions.[17] Indeed, the promulgation of the TRIPS Agreement within the World Trade Organization is testament to this change. Part II describes ways in which countries have started to alter patent law to reflect the global nature of the innovation enterprise, and Part IV discusses changes necessitated by the global marketplace for innovative products. The increasing number of jurisdictions worldwide having adopted and enforcing competition law statutes may nevertheless complicate the operation of these global IP rules, in view of the divergent positions various jurisdictions take on the intersection of competition law with IP rights and the absence of a global competition law framework, equivalent to the TRIPS agreement. Part III provides an illustration by focusing on a comparative analysis of US antitrust law and EU competition law applying to IP related practices. These legal developments are not, however, the only ways in which countries adjust to the multinational environment. To the contrary, a variety of mechanisms – mostly outside of intellectual property and competition law and thus outside the scope of this paper – have developed to stem the "brain drain" and even to repatriate knowledge workers who have emigrated for education or job opportunities.

Fourth, it has become evident that intellectual property laws are not the sole determinants of innovation. Firms appropriate the benefits of inventiveness in a variety of ways; for many firms, patent law is low on the list of strategies. As a survey by Alan Hughes and Andrea Mina conducted in the United Kingdom shows, depending on the size of the firm, lead time advantage, along with methods to perpetuate that advantage through secrecy, is first on the list for many firms. Thus, laws protecting trade secrets and enforcing confidentiality agree-

9 See, e.g., Fiona Murray and Siobhan O'Mahony, 'Exploring the Foundations of Cumulative Innovation: Implications for Organization Science' (2007) 18 Organization Science 1006.

10 35 U.S.C. §§200–212.

11 Peter Lee, 'Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer' (2004) 100 California Law Review 1503.

12 Sean M O'Connor, 'IP Transactions as Facilitators of the Globalized Innovation Economy' in Rochelle C. Dreyfuss, Diane L Zimmerman and Harry First (eds), Working Within the Boundaries of Intellectual Property-Innovation Policy for the Knowledge Society (Oxford University Press 2010) 203.

13 David J Teece, Gary Pisano and Amy Shuen, 'Dynamic Capabilities and Strategic Management' (1997) 18 Strategic Management Journal 509, 516; David J Teece, 'Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy' (1986) 15 Research Policy 285.

14 Robert P Merges and Richard R Nelson, 'On the Complex Economics of Patent Scope' (1990) 90 Columbia Law Review 839, 880.

15 See, e.g., Suzanne Scotchmer, 'Standing on the Shoulders of Giants: Protecting Cumulative Research and the Patent Law' (1991) 5 Journal of Economic Perspectives 29. The phrase, "standing of the shoulders of giants," derives from a letter Isaac Newton wrote to Robert Hooke, see Robert Andrews et al (eds), The Columbia World of Quotations No. 41418 (Columbia University Press 1996).

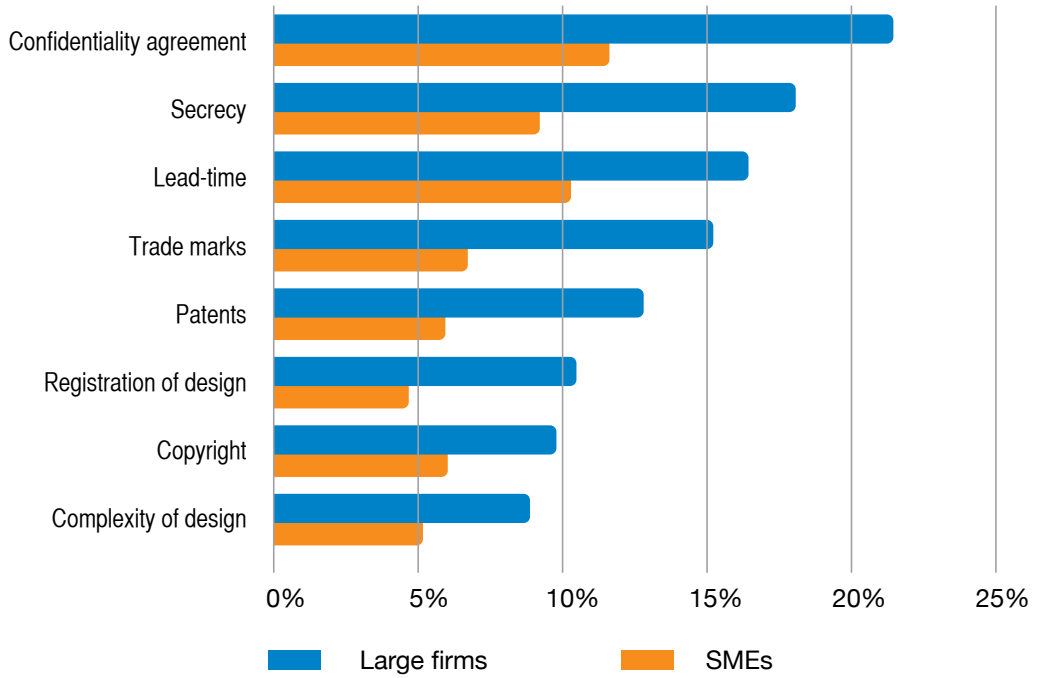
16 Dan L Burk and Mark A Lemley, The Patent Crisis and How Courts Can Solve it (University of Chicago Press 2009).

17 Pamela Samuelson, 'Intellectual Property Arbitrage: How Foreign Rules Can Affect Domestic Protections' (2004) 71 University of Chicago Law Review 223.

ments can be as important as more formal intellectual property law.[18] Indeed, Edwin Mansfield's work suggests that the pharmaceutical sector is alone in relying principally on patent law to capture returns from innovation.[19] Once again, a "one-size-fits-all" system makes little sense and Part II illustrates how patent law can be manipulated to deal with differences that arise from the technical field in which innovation is taking place, changes that occur as an industry matures, and other variables.

Figure 2[20]

Protecting innovation: techniques preferred by UK Firms
Source: Hughes and Mina (2010), from UK Innovation Survey



Closely related to this observation is another one: it is increasingly recognized that a significant amount of innovation occurs in the absence of any mechanism to directly appropriate returns. So-called "open innovation" is spurred by a variety factors, including curiosity; pleasure; the expectation of reputational benefits, professional advancement, and prizes; and to obtain reciprocal benefits.[21] These systems are often supported by ancillary profit-based interests. For example, IBM supports Linux, a free software platform, so that it has a base that will always be freely available to run its proprietary programs; user groups will develop new products (such as research tools) through free exchange within their own communities, but once these products move to the commercial stage, intellectual property rights are needed to promote further developments. Thus far, no intellectual property or competition law regime has made adjustments that recognize the importance of open innovation. Accordingly, the sorts of accommodations necessary are mentioned only briefly in the sections that follow.[22]

This discussion highlights not only the importance of intellectual property and competition law, but also the need for a governance system that stays abreast of technological, economic, and social developments, and which is steeped in the economic literature. Part V examines institutional design and highlights the regulatory choices that are available to optimize innovation law and policy.

18 See also Edwin Mansfield, 'R&D and Innovation: Some Empirical Findings' in Zvi Griliches (ed), R&D, Patents and Productivity, National Bureau of National Research (The University of Chicago Press 1984) 127.

19 Edwin Mansfield, 'Patents and Innovation: An Empirical Study' (1986) 32 Management Science 173. See generally Andrés López, 'Innovation and Appropriability, Empirical Evidence and Research Agenda' in The Economics of Innovation (WIPO 2009), available at <http://www.wipo.int/ip-development/en/economics/pdf/wo_1012_e_ch_1.pdf> accessed 28 April 2013.

20 Ian Hargreaves, 'Digital Opportunity – A Review of Intellectual Property and Growth' (May 2011), available at <http://www.ipo.gov.uk/ipreview-finalreport.pdf > at p. 17, accessed 28 April 2013.

21 See, e.g., Eric von Hippel, Democratizing Innovation (MIT Press 2005); Henry W Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology (Harvard Business School Press 2003); Katherine J Strandburg, 'Curiosity-Driven Research and University Technology Transfer' in Gary D Libecap (ed) (2005) 16 Advances in the Study of Entrepreneurship, Innovation and Economic Growth 97; Fiona Murray, et al, 'Of Mice and Academics: Examining the Effect of Openness on Innovation' (March 2009), NBER Working Paper Series, Vol. w14819, 2009, available at <http://ssrn.com/abstract=1369055> accessed 28 April 2013.

22 But see Rochelle C Dreyfuss, 'Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm' (2010) 31 Cardozo Law Review 1437.

II. THE INTERACTION BETWEEN HORIZONTAL IP RULES AND SECTOR SPECIFIC IP REGIMES

Any consideration of intellectual property law in the trade context must begin with the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), which sets minimum levels of protection that all members of the World Trade Organization (WTO) must meet. For the purpose of considering technological innovation, the patent provisions are the most significant. Under TRIPS, all members must provide patents for all "products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application" (in US parlance, they must be new, nonobvious and useful); no member can discriminate by field of technology, place of invention, or whether products are produced locally or imported (art. 27.1). The patent must give holders of product patents the right to prevent others from making, using, offering for sale, selling, or importing the identical invention; holders of process patents must enjoy the right to prevent others from using the process or using, offering for sale, selling or importing product made directly from the process (art. 28). The patent must include a disclosure of the invention (art. 29). And the right must endure for 20 years from the date the patent application is filed (art. 33).

Within these limits, there is considerable room for national variation. The TRIPS Agreement permits WTO members to exclude from patentability inventions whose exploitation would endanger the public order or involve immorality; specifically, members can exclude therapeutic, diagnostic and surgical methods, plants, and animals (for plants, however, sui generis protection is necessary) (art. 27.2 & 3). In addition, members may award compulsory licenses under certain, highly specified, circumstances (art. 31). Finally, there is a general exceptions test that allows members to enact "limited exceptions to the exclusive rights conferred by a patent, provided that such exceptions do not unreasonably conflict with a normal exploitation of the patent and do not unreasonably prejudice the legitimate interests of the patent owner, taking account of the legitimate interests of third parties" (art. 30). Art. 30 was strictly construed by a WTO Dispute Settlement Panel in the Canada-Pharmaceuticals case: the test is cumulative and the incursion on exclusivity must be extremely narrow. The Panel also required that any limitation meet the technological neutrality requirement of art. 27.1.[23] However, after the Canada dispute was resolved, a Ministerial Declaration (the Doha Declaration) emphasized that the Agreement (and presumably these provisions) must be interpreted through the lens of national interests in health, nutrition, and achieving balance between producers and consumers, and in a manner conducive to technological and socio-economic development (see arts. 7&8).[24] Arguably, the Declaration gives nations more flexibility than the Canada-Pharmaceuticals Panel envisioned.

There are also other flexibilities within the Agreement. Terms such as invention, new, inventive step, industrial application, make, use, sell, and offer for sale are not defined. And while the Agreement also requires effective enforcement (arts. 41–46), the Panel in another WTO case, China-Enforcement, interpreted the enforcement provisions in a manner that is highly deferential to national priorities.[25] Finally, TRIPS does not adopt rules regarding price controls or ownership of patent rights.

In keeping with the nondiscrimination provision in art. 27 of the TRIPS Agreement, national patent laws are trans-substantive: on their face, they treat all technologies alike. Nevertheless, as Dan Burk and Mark Lemley have cogently argued, the application of trans-substantive provisions to individual technologies can lead to law that is tailored to specific fields and national interests.[26] The following uses the elements of a patent case – validity, infringement, defenses, and remedies – to demonstrate how countries (principally the United States and the EU) tailor their law to their needs, to specific technologies, and in light of their views on economic and innovation policy. In addition, the United States applies special rules to government-funded inventions produced in certain institutions (mainly universities).

In theory, the varying needs of specific technologies could also be accommodated by varying the patent term. For example, a shorter term might be more appropriate in fields where upfront investment is low, where advances are highly cumulative, or where the field is developing rapidly.[27] However, art. 33 of TRIPS makes this form of differentiation difficult. More important, patent drafting is a highly developed art; drafters would surely find ways to write claims that fall into categories where the term is longer. Thus, this form of tailoring is not of practical importance.

A. Validity

Patents must meet subject matter, novelty, inventiveness, utility, disclosure (specification) and claiming requirements.

1. Patentable Subject Matter

Despite TRIPS and general agreement on the scope of patent protection, there are many national variations. In the United States, the "default" rules it that "everything under the sun that is made by man" is patentable, with three general exceptions: laws of nature, physical phenomena, and abstract ideas.[28] The assumption is that if Congress disagrees with coverage of a new technology, it will legislatively overrule the decision. In Canada, the reverse appears to be true: when

23 Panel Report, Canada-Patent Protection of Pharmaceutical Products, WT/DS114/R (March 17, 2000).

24 World Trade Organization, Ministerial Declaration of November 2014, 2001, WT/MIN (01) /DEC/1, 41 I.L.M. 746 (2002); World Trade Organization, Declaration on the TRIPS Agreement and Public Health, WT/MIN (01) /DEC/2, November 20, 2001, 41 I.L.M. 755 (2002).

25 Panel Report, China-Measures Affecting the Protection and Enforcement of Intellectual Property Rights, WT/DS362/R (January 26, 2009).

26 Burk and Lemley (n 16).

27 William D Nordhaus, Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change (MIT Press 1969).

28 See, e.g., Diamond v Chakrabarty, 447 US 303 (1980) (upholding patent on manmade microorganism). See 35 U.S.C. § 101.

a new technology is discovered, Parliament must decide if it is patentable.[29] Under the European Patent Convention (EPC),[30] exclusions are specifically enumerated. They include scientific theories, aesthetic creations, rules for performing mental acts, business methods, programs for computers, inventions contrary to the public order, plants and animal varieties, methods for treating and diagnosing humans or animals that are practiced on the body (EPC arts. 52.2 & 53). For the European Union, the Biotechnology Directive makes clear that the exclusion for plants and animals does not include biotechnological inventions, which are patentable so long as they do not involve processes for cloning human beings or modifying cell lines, or the use of human embryos for industrial or commercial purposes (arts. 1 & 6).[31]

The limitations on patentable subject matter reflect a variety of national interests. Laws of nature and principles of nature – which can also be regarded as failing the novelty test (because they have always existed) or the utility test (because in and of themselves, they have no useful applications) –are considered unsuitable subject matter because they are highly generative of multiple downstream innovations and applications. Permitting a patent would create too broad a right and impede, rather than promote, technological progress. This is particularly an issue for biotechnology. For example, the pending US Supreme Court case, Association for Molecular Pathology v Myriad Genetics, Inc.,[32] will determine whether isolated DNA, which is useful in diagnosing disease and developing therapeutics, is a part of nature or changed enough from nature to merit protection. Similarly, courts have rejected patents on simple diagnostics that do little more than relate two phenomena of nature.[33] This approach improves researchers' access to the kind of information that is needed to conduct research advancing society's understanding of the human body. The exclusion also has the side effect of also improving patient access to critical health information.

The exclusion for abstract ideas, scientific theories, mental acts, and computer programs can be explained in a similar way. In addition, they may be unsuitable for protection because they are difficult to claim – to effectively describe limitations to their reach. Software, for example, is patentable in the United States. While it is excluded as such under the EPC, much that is inventive in this field can be claimed in Europe through clever drafting. However, the current cellphone wars demonstrate that software patents can often be so broad or indeterminate, rights appear to overlap one another and patent thickets develop. Especially for products that incorporate multiple advances, it becomes extremely difficult to obtain clear freedom to operate. Indeterminate rights often draw patent "trolls"—nonpracticing entities (also called patent assertion entities) that buy these patents and then assert them against successful commercial players. As a result, Richard Posner, a major US jurist, has suggested that patenting is inappropriate in certain fields.[34] Thus, he would permit patents in fields such as pharmaceuticals, where upfront costs (for developing new molecules and conducting clinical tests) are high and inventions can be claimed clearly (molecules, for example, can be easily described). He would not award them in for software (or more broadly, for various aspects of the information technology (IT) industry) where neither of these factors pertains. Significantly, the TRIPS Agreement requires copyright protection for software (art. 10); it does not mention patents on software.

Concerns about patents in the IT industry also derive from two other problems. First, it can be difficult to search the existing literature for software. In contrast to industries where library research is significantly less expensive than inventing, software engineers often write their own programs rather than determine whether there is prior art they can utilize. As a result, independent inventors can find themselves subject to a patent suit. Second, because the upfront costs of writing software are minimal, there will often be sufficient non-patent incentives to make advances in the field. Linux, for example, is supported by people who program for fun and by IBM, which benefits from a free platform on which to run its proprietary software. Much the same can be said about business methods. Businesses develop new methods for their own internal purposes and often keep them secret, making it difficult to search the literature before re-inventing. Patents on business methods are specifically excluded by the EPC. Although they are presumptively patentable in the United States, the Supreme Court rejected a set of patents on hedging claims as too abstract to be considered statutory subject matter.[35] It is expected that after that case, many fewer business methods will be patented. Since business methods are arguably not "industrially applicable," patents in the field likely can be excluded consist with TRIPS.

In the United States, databases are largely unprotected by intellectual property rights for similar reasons. They are not patentable subject matter because they are not considered technological inventions. While creative selections or arrangements are protectable under copyright, the data (including scientific data) are not protected in and of themselves because they are regarded as facts and outside the ambit of copyright protection. However, the database industry does not lack incentives to compile databases. Often, they are produced for internal purposes. For example, the database in Feist Publications, Inc. v Rural Telephone Service Co, Inc.[36] was a telephone book in which the plaintiff had alphabetically listed the names, addresses, and numbers of its subscribers; it was published because publication was required by law; the database in British Horseracing Board v William Hill[37]

29 See, e.g., Harvard College v Canada, [2002] 4 S.Ct.R. 45.

30 Convention on the Grant of European Patents, Oct. 5, 1973, 13 I.L.M. 270, 1065 U.N.T.S. 199 (revised at the Convention on the Grant of European Patents Nov. 29, 2000), arts. 52–53.

31 Parliament and Council Directive 98/44/EC of 6 July 1998 on the legal protection of biotechnological inventions [1998] OJ L213.

32 653 F.3d 1329 (Fed. Cir.), cert. granted, 132 S.Ct. 1994 (2012).

33 Mayo Collaborative Services v Prometheus Laboratories, 132 S.Ct. 1289 (2012).

34 Richard Posner, 'Why There are Too Many Patents in America', The Atlantic (12 July 2012) <http://www.theatlantic.com/business/archive/2012/07/why-there-are-too-many-patents-in-america/259725/> accessed 28 April 2013.

35 Bilski v Kappos, 130 S.Ct. 3218 (2010).

36 499 US 340 (1991).

37 C-203/02 (ECJ, 9 November 2004).

was a compilation of information about the horse races run by the plaintiff. Analogously, at one time pharmaceutical companies sponsored free DNA databases because the firms' comparative advantage lay in developing therapeutics from the information; they did not want to share the profits from the downstream innovations with upstream right holders of DNA patents. For other databases, contractual agreements between the compiler and subscribers provide adequate remuneration to support compilation activities. To date, these contracts are regarded as fully enforceable. Unlike the situation in the United States, databases are subject to sui generis protection in the EU.[38] However, early evaluation of the effects of the Database Directive casts considerable doubt on its effectiveness at spurring the growth of the industry.[39]

Finally, some exclusions are related to issues of morality and public order. The United States leaves it to other regulatory agencies to determine whether an advance is immoral (except that US law excludes patents encompassing a human being). As we saw, the EPC contains a morality exclusion and it has been imposed to prevent the patenting of stem cells and material derived from a cell that could eventuate in a human being.[40] It remains to be seen whether research in the EU is inhibited by this restriction. Furthermore, many countries exclude plants from patentability because they regard their availability as necessary to safeguard nutrition. However, there is no such exclusion in the United States and per TRIPS, every country must have at least sui generis protection for plants. Many do it through the UPOV Convention,[41] which safeguards the interests of farmers and breeders with exemptions permitting farmers to save seed from one growing season to another and allowing breeders to use protected seeds for research purposes. (A general discussion of defenses to infringement is presented below).

2. Novelty

In most patent systems, a rejection on novelty grounds requires that every element of the claimed invention appear in a single piece of prior art (the US calls this the "all elements rule").[42] While this requirement is important – for example, it prevents patenting of natural phenomena, natural laws, and old products based on new uses – it is a very rigid requirement. Accordingly, it is not very helpful in distinguishing among technologies.

The one exception is pharmacology. In a recent study of the pharmaceutical sector, the European Commission found that originator firms had developed an "evergreening" strategy to prevent generic substitution after patent expiration.[43] At one time, a common mechanism was to patent one drug and, towards the end of the patent term, patent its metabolite. No one could take the drug after expiration without (eventually) creating the metabolite and infringing. In the United States, this practice was ended by deeming the metabolite "inherent" in the original drug, rendering the metabolite non-novel.[44] (Other mechanisms for dealing with "evergreening" are discussed in the next section.)

3. Nonobviousness (Inventive Step)

The nonobviousness requirement demands that the invention be beyond the grasp of a person having ordinary skill in the art (called PHOSITA in the United States). In the United States, for example, the inquiry starts by finding all the prior art that is relevant to the invention, determining the gap between the prior art and the claimed invention, determining the level of skill in the art, and then asking whether PHOSITA can bridge the gap.[45]

The nonobviousness requirement is arguably the most powerful tool for crafting laws that meet national needs and the demands of specific technological fields. First, because the level of skill is different (and changing) for each technology, the nonobviousness requirement automatically adjusts the availability of protection to the maturity of the industry. For example, when biotechnology was a new endeavor, the level of skill was considered quite low. At that time, DNA sequencing was difficult and it was easy to show that isolated DNA was nonobvious.[46] Now that even high school students can sequence DNA, isolated DNA is considered obvious.[47] In this way, the nonobviousness requirement encourages new technologies because it makes patents easy to get when the level of knowledge in the art is low. When the industry matures, the level of skill in the field grows, which means that more inventiveness is needed to merit protection – which also means that, at that point, the patent system encourages "leapfrogging," investing in inventing advances that are substantially more sophisticated than what went before. Second, nonobviousness depends on how predicable it is that a particular experiment will be successful. For example, mechanical inventions are generally considered more predictable (and hence obvious) than biotechnological inventions. In this way, nonobviousness automatically adjusts patentabilty to the maturity of the underlying science and to the degree of risk inventors and investors undertake.

Because TRIPS Agreement does not define "inventive step," the nonobviousness requirement also allows countries to ad-

38 Parliament and Council Directive 96/9/EC of 11 March 1996 on the legal protection of databases [1996] OJ L077/20.

39 Commission of the European Communities. First evaluation of Directive 96/9/EC on the legal protection of databases (Brussels, 12 December 2005) <http://ec.europa.eu/internal_market/copyright/docs/databases/evaluation_report_en.pdf> accessed 28 April 2013.

40 Case C-34/10 Brüstle v Greenpeace eV, Judgment of 18 October 2011 (not yet published).

41 International Convention of the Protection of New Varieties of Plants, Ger.– Neth.– U.K., Dec. 2, 1961, 815 U.N.T.S. 89 (revised Nov. 10, 1972, Oct. 23, 1978 and Mar. 19, 1991).

42 35 U.S.C. §102.

43 European Commission, Competition DG, Pharmaceutical Sector Inquiry: Final Report (8 July 2009), <http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/staff_working_paper_part1.pdf> accessed at 28 April 2013.

44 Schering Corp. v Geneva, Inc., 339 F.3d 1373 (Fed. Cir. 2003).

45 35 U.S.C. §103.

46 See, e.g., In re Deuel, 51 F.3d 1552 (Fed. Cir. 1995).

47 In re Kubin, 561 F.3d 1351 (Fed. Cir. 2009).

just their laws to their technological environment. The United States Court of Appeals for the Federal Circuit, the court that hears all patent appeals, at one time set the level of nonobviousness very low. As a result, patent thickets developed and it became increasingly difficult to determine freedom to operate. In KSR v. Teleflex Inc.,[48] the Supreme Court raised the standard, noting that PHOSITA is not an automaton and is capable of taking creative steps, such as adapting an invention made for one purpose to another use. Further, the Court held that market demand must be considered a motivation to invent. The change in approach to DNA patenting was a direct result of this decision. More generally, the nonobviousness requirement can be used to deal with cumulative technologies: a higher level of inventiveness will render marginal improvements nonpatentable and will thin the thickets that might otherwise develop. Thus, Burk and Lemley suggest that the problems in the IT industry could be ameliorated if PHOSITA were assumed to be highly skilled. Fewer patents would then issue.

Developing countries could also exploit this approach: when local industry is unsophisticated, the inventive step could be set very low so that even less skilled technologists could acquire patents. The availability of protection would, presumably, provide local industry with significant incentives to become innovative. Alternatively, the inventive step could be set very high so that marginal improvements on existing technologies remain accessible. For example, in some places, refrigeration is scarce and it is important for the population to have access to formulations of pharmaceuticals that are stable at ambient temperature. If such marginal improvements were considered within the skill of the ordinary artisan, then these formulations could be developed without triggering a new term of patent protection.

As the previous example makes clear, the nonobviousness requirement can also be deployed to deal with the pharmaceutical industry's evergreening problem. Another mechanism for extending patents is to find a new use for old pharmaceuticals. A new product patent cannot be obtained because the product lacks novelty, but the developer could possibly obtain a patent on a process for using the (old) medicine for the new purpose. Viagra, for example, was originally invented to treat angina, but a patent on a process for treating erectile dysfunction remained available. By the same token, the form of an existing medicine can be changed – an isomeric mixture can be separated and the active isomer could be considered a new molecule; the salt form of the medicine could be altered. Under both US and EPC law, these changes will generally be considered patentable. Generic manufacturers may market the old pharmaceutical when its patent expires, but with effective advertising, the patent holder can convince doctors to switch to the newer compound, thus extending the period of effective exclusivity.

To deal with this problem, India's patent law demands a high degree of inventiveness. A new use of a known substance is not patentable; a new use of a known process is not patentable unless it requires a new reactant or results in a new product; and a change in form is not patentable unless it enhances efficacy.[49] Based on this provision, the Indian courts denied a patent on Glivac (Gleevac), which is used to treat leukemia. The denial of protection not only protects access to Glivac in India and other countries with similar laws (or where it is not patented), the ability to produce it enhances the profits of the strong Indian generic drug sector. It remains to be seen whether India's rigorous definition of the inventive step will be considered TRIPS-compatible.

4. Utility (Industrial Application)

As noted earlier, the industrial application requirement leads some countries to refuse patents on natural phenomena, natural principles, mental steps, scientific theories, computer programs, as well as business and therapeutic and diagnostic methods.[50] It is also useful in controlling the timing of patenting. The prime example is once again drawn from biotechnology. In the early years, attempts were made to patent expressed sequence tags (ESTs), isolated partial DNA sequences. Such patents would have created dense packet thickets, with multiple rights in specific genes. The US Patent and Trademark Office (PTO) avoided the problem by issuing Utility Examination Guidelines which requires patentees to disclose a "specific, substantial, and credible utility" for the claimed gene composition.[51] As a result, significantly more work is required before these advances can be patented. In the end, only sequences that can be associated with a specific physical manifestation are regarded as meeting the utility requirement. The race to patent abated and patent thickets were avoided.

5. Disclosure (Specification) and Claiming

The disclosure requirement demands that a patentee enable a person of ordinary skill in the art to make and use the patented invention. In the United States, the disclosure must also contain a written description of the invention.[52] All patents must include claims that specify the exact reach of the invention for which a patent is sought; claims may not exceed the scope of the disclosure. Because these requirements also use PHOSITA as a benchmark, they create powerful opportunities for tailoring. Countries that are not yet at the technological frontier and lack absorptive capacity can demand more detailed disclosure than is required of countries with more technologically sophisticated artisans. Similarly, these requirements can be adapted to specific technological arenas.

Biotechnology is a case in point. As we saw, one problem with upstream biotechnology inventions (such as isolated DNA) is that the patents can be so broad, they impede progress. In

48 550 US 398 (2007).

49 India Patent Act, § 3 (d).

50 See, e.g., 35 U.S.C. § 101.

51 66 Fed. Reg. 1092, 1092–99 (Jan. 5, 2001).

52 35 U.S.C. § 112.

the United States, the Federal Circuit has tried to solve this problem with strict disclosure requirements. For example, the party that determined the sequence of the DNA responsible for the production of insulin in a rat also claimed the sequence for the DNA responsible for production of insulin in a human (in this respect, rat and human DNA were known to be very closely related). The patent disclosed the rat sequence, but the human sequence had yet to be determined. Federal Circuit held the patent on the human sequence was invalid on the ground that the patent only provided a written description of the rat sequence.[53] The result was a substantially narrower patent; indeed, the human sequence might not have been patentable at all if it was obvious to PHOSITA in light of the rat sequence. Similarly, the Federal Circuit rejected a patent on products capable of reducing NF-κB activity on the ground that the patent provided a description of how to find these products, but not a written description of the products themselves.[54] By rejecting this sort of patent, the court prevented inventors of new research methods from "reaching through" the process patent and acquiring rights over the products found as a result of using the process. The outcome, in short, reduced the power of biotech patents to inhibit competitive development of downstream products.

It should be noted that the interaction of the disclosure and nonobviousness requirement is problematic. In general, the level of skill of PHOSITA is considered the same for both requirements. Accordingly, the harder it is to acquire patent protection (because PHOSITA is deemed to be highly skilled), the less disclosure is required (because PHOSITA is easily enabled). To Burk and Lemley, this is part of the problem in software. Software engineers are considered so skilled; programs can be disclosed and claimed in very general terms. In fact, codes and algorithms are often unnecessary so long as the patent discloses the functionality the invention must perform.[55] But these generalities are one reason that the scope of software claims is so indeterminate. Better would be to assume that PHOSITA is unskilled and needs more information, for that would lead to disclosures that are more detailed – that include algorithms or code – and thus narrower. Further, it would be easier to determine when claims accompanying these detailed disclosures are infringed. A less skilled PHOSITA would, however, dilute the nonobviousness requirement – less would be required to merit protection and that would lead to more patents and deeper patent thickets. Though no country has done so to date, a better approach would be to decouple the determination of PHOSITA in these provisions. Someone seeking to invent could be determined to have a high level of skill, such as the level of skill described in KSR, on the theory that only people with a degree of creativity are likely to be inventors. As a result, a great deal of ingenuity would be required to merit protection. In contrast, those seeking to learn from a patent or to read a patent to determine freedom to operate are not likely to be inventors – they are merely followers. Accordingly, they could be deemed to have a lower degree of skill, and therefore to require a higher level of (more detailed) disclosure.

SUMMARY. Validity determinations can be used to deal with problematic features of the patent system. Thus, many countries have devised doctrines to deem inventions of extraordinary social significance not patentable subject matter. The subject matter requirement is, however, a blunt instrument – a decision to deny protection in a specific arena eliminates the possibility of using patents to encourage innovation. For example, this could be a difficult issue in the biotech sector. If DNA is found unpatentable, that would free DNA for research and diagnostic purposes, but the rejection would also mean that there would be no patent protection on nature-based DNA products when used therapeutically, and that might discourage promising health-related innovation.

In some areas – databases, plants – this problem is solved through sui generis regimes that are better tailored to industrial needs. A proliferation of such regimes would, however also be problematic. It would introduce uncertainty into innovation law and require new international negotiations. To the extent possible, it is therefore better to cope with problems through the use of other provisions of patent law. In the United States, biotechnology patents have been substantially narrowed and the number of patents reduced through the utility and nonobviousness requirements. The IT sector could similarly benefit from this sort of refinement. Other countries, such as India, have experimented with using the nonobvious requirement for other purposes, such as in the pharmaceutical industry to control evergreening and improving access to medicine.

Still, these provisions will certainly allow some patents, including very broad patents, to issue. However, there are post-issuance rules that can also be used as policy levers.

B. Infringement

There are two main issues regarding infringement: interpreting the claims (that is, setting the scope of the patent) and deciding who should be regarded as an infringer.[56]

1. Claim Interpretation

In the United States, there are essential two ways to interpret claims: literally and under the doctrine of equivalents (a third idea is discussed below). For Europe, the EPC nominally covers only the issues administered by the European Patent Office (EPC), which is to say patent validity. A "European patent" consists of a package of national patents and is enforced through national courts under those courts domestic laws (so far, there is no Community or Unitary patent). But because the strategy for claiming is heavily dependent on how claims are interpreted, the EPC includes a Protocol on the Interpretation of Article 69 (the article on the scope of

53 Regents of the University of California v Eli Lilly and Co., 119 F.3d 1559 (Fed. Cir. 1997).

54 Ariad Pharmaceuticals, Inc. v Eli Lilly and Co., 598 F.3d 1336, 1341 (Fed. Cir. 2010) (en banc).

55 Fonar Corp. v Gen. Elec. Co., 107 F.3d 1343 (Fed. Cir. 1997).

56 See, e.g., 35 U.S.C. § 271.

protection). The Protocol cautions that interpretation must go beyond the "literal wording used in the claims." It must be conducted in a manner that "combines a fair protection for the patent proprietor with a reasonable degree of legal certainty for third parties." The Protocol also provides that "due account shall be taken of any element which is equivalent to an element specified in the claims." In practice, this means that EPC patents are interpreted a single step, whereas US patents are interpreted in two steps, but the two systems reach roughly the same results for the same reasons. For expository purposes, the US approach will be followed here.

a. Literal Infringement. Literal infringement is determined by comparing each element of the accused product with the elements of the patent claim (another "all elements" rule). In the United States, claims can be formulated in means plus function form, meaning that particular elements can be claimed by coupling a basic structure to its function. In theory, this significantly broadens claims; in practice, the Federal Circuit, which prefers narrow claims, conducts an element-by-element comparison, asking if the element in the accused product is the equivalent of the part of the specification covering the element claimed in means plus function terms. (This is a principle of literal infringement despite its use of the word "equivalent.").

Because literal infringement uses the same "all elements" test as the novelty requirement, it is – like novelty – a rigid test that does not leave a great deal of room for tailoring. The one exception may be in the biotech sector. In Monsanto Technology LLC v. Cefetra BV, the European Court of Justice differentiated between DNA molecules that are performing the function for which they are patented (in that case, resisting the herbicide Roundup) and molecules that had ceased to perform that function (in the case, because they were found in soy meal used to feed cattle).[57] Only the former embodiments can be deemed infringing. German patent law includes a variation of this approach. The scope of gene patents is limited to the disclosed utility.[58] Under this view, DNA patents would be infringed if used in research (to determine their function in heredity) or therapeutically (to instruct the patient's body to encourage or suppress particular functions), but they might not be infringed when used as a diagnostic. Control over diagnostics can interfere with access to medical information (the patent holder in the Myriad case, for example, holds patent rights over genes associated with early-onset breast cancer and does not permit second opinion testing or quality control). With this approach to literal infringement, important social needs could be safeguarded without sacrificing the incentives patent would bring to the development of new therapies. This approach would not, however, improve the situation for upstream research, where genes are functioning for their purpose. Furthermore, the TRIPS compatibility of this approach has yet to be determined.

b. Infringement under the Doctrine of Equivalents (DOE). Systems provide for nonliteral infringement because without such a doctrine, it would often be extremely easy to avoid patent infringement while still practicing the insights of the invention: all a copyist would need to do would be to change any one element, and the accused product would escape the "all elements" analysis.

In the United States, loosely speaking, infringement under the DOE is analyzed using a function-way-result rubric. As stated by the Supreme Court, "a patentee may invoke this doctrine to proceed against the producer of a device if it performs substantially the same function in substantially the same way to obtain the same result."[59] The analysis is made with reference to PHOSITA. An element by element comparison is made; for any element that is different from what was claimed and described in the specification, the court essentially asks whether a person of ordinary skill in the art could have made the change. If it was obvious, it is considered the sort of thing that a copyist should not do; if it was nonobvious, then it escapes infringement. There are two caveats: the patentee cannot capture through the DOE advances that would have been considered nonnovel or obvious on the patent's priority date. Furthermore, the patentee cannot capture inventions surrendered during examination ("prosecution history estoppel").[60]

Note that while this test looks a great deal like nonobviousness, under US law, there is a temporal shift. In nonobviousness, the capacity of PHOSITA is determined at the time of invention (or filing); here it is determined by the state of the art at the time of infringement. Thus, later-developed technologies can be regarded as an obvious substitution.

Because it references PHOSITA, the doctrine of equivalents can be a powerful tool for tailoring. Economists split, however, on how (and whether) it should be used. Traditionally, it has been used to protect "pioneer" inventions – inventions that open a new field. The theory is that opening a new field requires very strong incentives and these can be increased by expanding the reach of the patent. Indeed, the DOE is arguably especially important for pioneers because the first version of a new technology is rarely user-friendly enough to be commercialized successfully. Unless the patent is interpreted to read on improvements, the pioneer may earn no return at all. Furthermore, some liken patents to mining claims, and think of them as giving one party the power to orchestrate efficient development of the "prospects" the earliest invention uncovers.[61] For mining claims to work, they must accord broad protection to pioneers. Finally, broad protection encourages the next generation to "leapfrog" and push the technological field further more quickly.

57 Case C-428/08, Monsanto Technology LLC v Cefetra BV and Others [2010] ECR I-6765.

58 Gesetz zur Umsetzung der Richtlinie über den rechtlichen Schutz biotechnologischer Erfindungen [Statute Implementing the EU Biotechnology Directive], Jan. 21, 2005, BGBl. I at 146, § 1a (4) (F.R.G.).PatG § 1a (4). France has adopted a similar approach, see Code de la Propriété Intellectuelle Art. L613–2–1.

59 Graver Tank & Mfg. Co. v Linde Air Products Co., 339 US 605, 608 (1950).

60 See Festo Corp. v Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 US 722 (2002).

61 Kitch (n 7).

Recently, however, economists have questioned this logic. If, as suggested, the earliest patents in a field require considerable development, a strong case can be made that this development is best accomplished competitively. Giving a broad scope to the doctrine of equivalents is much like patenting upstream research inputs: the patentee's control can impede, rather than promote, progress.[62] Thus, some economists argue the doctrine of equivalents should be interpreted very narrowly when the inventor is a pioneer.

The controversy over the DOE is in essence a dispute over the viability of contracting. Those who believe in broad pioneer patents are contracting optimists – they think the patentee will widely license out the right to develop applications because competitive development is in his interest – the patentee will make more money if more and better applications are developed. Contractual pessimists doubt patentees will always act rationally. They may have insufficient information to evaluate potential licensors and either refuse to license or do it badly; they might fear superseding inventions will cannibalize their own product or process; they may have an overly optimistic view of the value of their contributions. In some arenas (for example, university licensing), the licensor and licensee may have very different objectives and thus may find it hard to find a mutually agreeable position. Contractual pessimists therefore suggest that the pioneer patentee's rights be limited so that the public is free to further develop the pioneer prospect.

The DOE can be modified to deal with the problem mentioned above in connection with the IT industry and business methods. As we saw, in both arenas, independent invention is more prevalent – and often more efficient – than looking for solutions to problems in the prior art. Accordingly, independent inventors often get caught up in enforcement actions – a patentee asserts a patent the later inventor was not aware of and did not learn from. The Federal Circuit has suggested that in these cases, the DOE should not be applicable. The doctrine is equitable in nature, accordingly the court has discretion on whether to find infringement. Furthermore, independent inventors sink similar costs to those paid by the pioneer and thus cannot undercut its market. The Supreme Court has, however, rejected this analysis thus far: direct patent infringement is a strict liability offense. Because of TRIPS' technological neutrality principle, it is likely a WTO member adopting this approach would have to apply it to all fields of technology. However, it is likely to have its most important application in these sectors.

c. The Reverse Doctrine of Equivalents. As noted in the lead-in to this section, there are only two ways to interpret claims. However, the US Supreme Court has also suggested that "where a device is so far changed in principle from a patented article that it performs the same or a similar function in a substantially different way, but nevertheless falls within the literal words of the claim, the doctrine of equivalents may be used to restrict the claim and defeat the patentee's action for infringement."[63] In modern times, no court has ever decided a case on reverse DOE grounds. However, economists who favor narrow patents strongly suggest the doctrine should be revived as a way to foster downstream competition and avoid the possibility that a patentee will acquire rights over technology he could not possibly have invented. Biotechnology provides an example. In the one case in which the Federal Circuit cited the reverse DOE, the patentee had produced a human clotting factor by concentrating it from human plasma. The accused infringer made it biochemically, through a recombinant process using monoclonal antibodies. Its procedure made a much purer and safer product. The question was whether the patent on the growth hormone was infringed by the new preparation. The Federal Circuit returned the case to the trial court, suggesting that the reverse DOE might apply.[64] The case was, however, ultimately resolved in a different way.

2. Parties to Infringement

Most enforcement actions are brought against parties who are directly practicing the claims. However, it is possible to sue those who aid and abet infringement (inducers of infringement) and those who contribute to the infringement of others by selling them material whose main use is to infringe (contributory infringers). In both cases, a degree of knowledge of the infringement is necessary; in both situations the defendants are treated as equivalent to infringers. Parties who supply components to foreign markets knowing they are specially adapted to infringement and parties who import goods made with processes patented in the country of importation are also treated as equivalent to infringers. (Note that tying goods to patent licensing requirements could be considered a violation of competition law. That issue is discussed in the competition section).

For the most part, these approaches work equivalently in all forms of technology. However, they assume particular importance in the case of mechanical inventions, where many parts are often necessary to practice the invention. The importation provision is especially important in the biotech sector, where it would otherwise be possible to produce nonpatented products (such as insulin) using a patented biological process in an "information haven," and then sell the product internationally. The IT sector also has a strong interest in these doctrines. In some parts of the sector, it is possible to split infringement among jurisdictions. For example, Blackberry cellphones are popular in the United States but parts of the operation are located in Canada. Since patent law is territorial, all the elements in a patent claim must be practiced in a single jurisdiction. In addition, the sector is concerned because of the possibility of divided infringement – interactive software is practiced by more than one party and if each party must practice every element of the claim, then no party

62 Merges and Nelson (n 14).

63 Graver Tank & Mfg. Co. v Linde Air Products Co., 339 US 605, 608–609 (1950). See also Westinghouse v Boyden Power Brake Co., 170 US 537 (1898).

64 Scripps Clinic & Research Foundation v Genentech, Inc., 927 F.2d 1565, 1580 (Fed. Cir. 1991).

is liable for infringement. In many jurisdictions, concepts of contribution and inducement allow the courts to find both, or one of the parties to be infringers. (In some cases, liability is alternatively predicated on concepts of beneficial use or vicarious responsibility).

SUMMARY. Approaches to interpretation hold scope for differentiating among technologies. To date, however, the main use has been to protect pioneer patents, and economists now question whether that approach is correct. Furthermore, many commentators question whether it is appropriate to vary the interpretation of the claims according to the technology. Patents are public documents; they are used by rivals to determine freedom to operate. Investors use them to decide whether to provide capital to inventors. Other firms use them to evaluate potential targets for acquisition and merger. For these purposes, it is helpful if the approach to interpretation does not vary significantly from field to field. The determination of who is an infringer must, however, be sensitive to the way inventions in different technologies are practiced.

C. Defenses to Infringement

Because validity and infringement analysis look first and foremost at the invention, defenses to infringement are a crucial means for balancing the proprietary interests of the patentee against the access interests of competitors, of consumers of patented technologies, and of the state. Defenses (including awards of compulsory licenses) also offer the most targeted way to deal with special problems. As noted above, TRIPS permits exceptions (art. 30) and compulsory licenses (art. 31) under certain highly constrained conditions, including to deal with blocking patents (art. 31 (l)). In Canada-Pharmaceuticals, a WTO Panel required that even exceptions meeting the standards of art. 30 be technologically neutral (art. 27.1). Even so, defenses can focus on problems arising in specific fields. First, it is not clear that the Appellate Body of the Dispute Resolution Board will agree with the Panel decision: art. 30 requires that exceptions be "limited" and a provision targeted at a particular field is more limited than a technologically neutral one. Second, the Panel acknowledged that a particular field might raise a special problem. So long as the provision is not facially limited to one field (so that any other field with a similar problem will also benefit), the Panel held that the provision would not be regarded as discriminatory.

The reverse doctrine of equivalents, discussed above, can be analyzed as a defense to infringement. Other defenses include defenses for socially significant uses, for government use, and in favor of prior users. Patentees' prerogatives can also limited by the exhaustion doctrine, various doctrines related to bad acts (such as patent misuse), and competition law. Exhaustion and competition law are discussed separately below.

1. Socially Significant Uses

a. Research. The predominant exemption in the socially significant category is the research defense. As we saw in connection with the biotech sector, the patenting of upstream research inputs (such as isolated DNA) can impede progress by decreasing the opportunity for competitive development of research prospects. While a subject matter exclusion would eliminate this danger, it would also eliminate the use of patents to incentivize innovation in the excluded area. A well-crafted research exemption can split the difference. Commercial use of the invention is made subject to the patent, while researchers are allowed to freely explore new research prospects. Thus, many countries recognize a general exception for research uses – in some countries, all research uses; in others, noncommercial uses.

To many countries, research tools are a category of their own, for if they were subject to the exemption, then the market for selling or licensing these tools could be significantly diminished. Thus, many countries distinguish between research with a patented invention, which is not permitted, and research on a patented invention (for example to learn how it works, to determine whether it accomplishes the utility stated in the patent, to find other uses of the invention), which is permitted.

In the United States, the availability of a research defense is in doubt because in Madey v Duke University, the Federal Circuit held that a research exemption is not applicable to work carried out as part of the business interests of the defendant.[65] Thus, research institutions – such as universities – apparently cannot use the research defense. Nevertheless, surveys by economists suggest that research scientists tend to ignore patents.[66] They are rarely sued, perhaps because they are judgment proof; perhaps because patent holders are better off allowing them to find new applications and then suing them after these applications have been developed. However, there is empirical work suggesting that research diminishes when significant inputs are patented[67] and some observers believe that the pressure to narrow the definition of patentable subject matter would diminish if the availability of inputs for research purposes were assured. Many universities have taken matters into their own hands and now refuse to grant licensees rights to control university research uses (and sometimes all research benefiting neglected populations). In Europe, the

65 Madey v Duke University, 307 F.3d 1351 (Fed.Cir. 2002).

66 Wesley M Cohen and John P Walsh, 'Access – or Not – in Academic Biomedical Research' in Rochelle C. Dreyfuss, et al (eds), Working Within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Economy (n 12) 3–28; John P Walsh, Ashish Arora and Wesley M Cohen, 'Effects of Research Tool Patents and Licensing on Biomedical Innovation' in Wesley M Cohen and Stephen A Merrill (eds), Patents In The Knowledge-Based Economy (National Research Council 2003) 285.

67 Kenneth G Huang and Fiona E Murray, 'Does Patent Strategy Shape the Long-Run Supply of Public Knowledge? Evidence from Human Genetics' (2009) 52 Academy of Management Journal 1193; Fiona Murray and Scott Stern, 'Do Formal Intellectual Property Rights Hinder the Free Flow of Scientific Knowledge? An Empirical Test of the Anti-Commons Hypothesis' (2007) 63 Journal of Economic Behavior and Organization 648. Cf. Heidi L Williams, 'Intellectual Property Rights and Innovation: Evidence from the Human Genome' (Working Paper No. 16213, National Bureau of Economic Research Working Paper, 2010) <http://www.nber.org/papers/w16213> accessed 1 August 2011 (work protected by agreements of confidentiality).

Draft Community Patent Regulation, as well as national patent statutes recognize an experimental use exception.[68]

In common with many WTO countries, the United States does recognize a research exemption focused on the pharmaceutical industry. Under the so-called Bolar exemption,[69] generic drug manufacturers can conduct research using patented medicines during the patent term so long as the research is intended to generate data needed by authorities regulating drugs and veterinary biological products. In the United States, patentees are granted an extension of their period of exclusivity in exchange for tolerating the use, on the theory that patentees lose part of the term generating their own data for the regulatory authorities. Other countries have similar provisions, though some (including Canada) do not provide patent holders with extensions. This is the provision that was approved in the Canada-Pharmaceutical (art. 30) case. Strong arguments can be made that an analogous exemption should be recognized for software, where there is considerable consumer demand for interoperable and backwards-compatible products. In some cases, it is necessary to work with patented software to find the application program interfaces (APIs) or other material, such as validation codes, needed to create such products. Patentees regard these uses as infringement in order to protect their initial markets and their markets for peripherals and other compatibles. But economists have suggested a reverse engineering defense that would operate along the lines of a research defense would improve competition.[70] Article 6 of the EC Software Directive, harmonizing copyright protection of software across the EU, also authorises the decompilation of "parts of a software program", without the permission of the copyright holder, if this was, "indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs."[71]

b. Diagnostics. As we saw, many countries exclude diagnostics from patentability. However, these provisions usually apply only to diagnoses conducted directly on the body (e.g., examining the heart with a stethoscope). Modern techniques involve laboratory examination of biological samples and relating phenomena to each other (for example, relating a DNA sequence to vulnerability to disease or to the beneficial effect of a drug). These correlations could be excluded from patentability to protect patient access to the test and to second opinion testing, and to allow agencies to monitor quality. Other approaches include all diagnostics, exempting diagnostics used for second-opinion testing, or quality-control from infringement liability, or compelling those holding patents on diagnostics to agree to license. No country has taken such actions as yet.

c. Supplying the market. Some countries will award compulsory licenses in cases where the patentee fails to adequately supply the market. This is especially prevalent in the pharmaceutical sector, where inadequate supplies can lead to serious health problems. Originally, the TRIPS Agreement permitted such licensing only to predominantly supply the local market (art. 31 (f)). However, many countries cannot manufacture pharmaceuticals. In the Doha Declaration, the WTO Ministerial Conference agreed to alter the Agreement to permit one nation to award a compulsory license in favor of another country. These licenses must follow strict conditions to prevent the drugs from flowing into countries where supply is adequate (art. 31bis).

Analogously, countries that do not usually permit parallel importation (see below) may lift that ban in cases where the patentee refuses to adequately supply the market, or does not offer goods at prices comparable to those charged in other markets.[72]

d. Working. There are countries that take the position that patents should promote local employment and technological training. Under the Paris Convention, countries were permitted to issue compulsory licenses if the patentee failed to work the patent locally in a specified time period (3–4 years) (art. 5). However, the TRIPS Agreement does not permit discrimination on the basis of whether a product is locally produced or imported. Accordingly, TRIPS can be interpreted as overriding this provision. Paris has, however, been incorporated into TRIPS (art. 2.1). Accordingly, many believe that such licenses can still be awarded. The United States generally regards the patentee as competent to decide when it is efficient to work the patent in the country. Accordingly, it does not use working requirements.

Some jurisdictions outside the United States also provide that a compulsory license can be awarded for refusals to license on reasonable terms.[73] These provisions are rarely invoked in court because their in terrorem effect tends to induce voluntary licensing. These provisions are typically aimed at blocking patent situations. They would also be useful in the biotech arena, to induce firms holding rights over important diagnostic and research inputs to license or to pool their patents. It might also be helpful in sectors, such as IT and semiconductors, where multiple inputs are needed to bring products to market.

2. Government Use

The United States does not recognize patent infringement by the United States. Instead, the law provides that when a patented invention is "used or manufactured by or for the United

68 Article 9 (b) of the Draft Community Patent Regulation (noting that "acts done for experimental purposes relating to the subject matter of the patented invention" are not found to infringe the patent); Article 60 (5) of the UK Patent Act of 1977 provides also for an experimental use exception as well as in situations where the infringement act of the patent is done privately and for purposes that are not commercial.

69 35 U.S.C. §271 (e) (1). The exception is named for Roche Products, Inc. v Bolar Pharmaceuticals, Inc., 733 F.2d 858 (Fed. Cir. 1984), the case that focused attention on the problem of timing the research necessary for generic substitution.

70 Mark A Lemley and Julie E Cohen, 'Patent Scope and Innovation in the Software Industry' (2001) 89 California Law Review 1.

71 Parliament and Council Directive 2009/24/EC of 23 April 2009 on the legal protection of computer program [2009] OJ L111/16.

72 See, e.g., Australian Government, Productivity Commission Report, Restrictions on the Parallel Importation of Goods (2009).

73 See, e.g., Patents Act, 1977, c. 37, §48A (1) (b) (i) (Eng.); 2 John W Baxter, World Patent Law and Practice §8.02 (2001); see also Robert Merges, 'Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents' (1994) 62 Tennessee Law Review 75, 104.

States without license," the patent holder can bring an action for "reasonable and entire compensation" in the United States Court of Federal Claims.[74] Other nations have similar provisions.

3. Prior Users

As we saw earlier, in the IT sector and with respect to business methods, searching the prior art is difficult. If art is sufficiently obscure (e.g. a trade secret), it may not qualify as prior art for purposes of determining novelty and nonobviousness. In such cases, a later inventor can acquire a valid patent. The first user could then find himself an infringer. To avoid that result, at one time, the United States provided a defense in favor of those who used a business method invention earlier than a specified time before a patent application on the method was filed. While the defense was only available to business methods, it covered methods of doing business with a computer and thus also served much of the IT community. In first to file systems, a prior user right is available in all sectors, to anyone who begins to use the invention for more than a specified time prior to filing.[75]

4. Bad Acts

In the United States, a patent is unenforceable in its entirely if any claim was acquired through knowing deception of the patent office (e.g. by intentionally withholding prior art that is material to the patentability decision). All sectors are equally affected by this "inequitable conduct" defense.

In some systems, abuse of the patent is also regarded as a bad act. Under the doctrine of "patent misuse," the patent is unenforceable until the misuse is purged. At one time, many activities were considered misuse, including tie-ins, tie-outs, package licenses, price fixing, and grant backs. The defense differed from a competition law violation in two ways: there was no requirement to prove a dominant market position and the only result of proving misuse was unenforceability (in contrast, competition violations require proof of dominance and a successful patentee is awarded damages). Many observers believe that patent misuse would be very useful in the biotech sector and the IT sector (particularly for semiconductors). In these industries, multiple patented inputs are needed to bring products to market and there is considerable danger that one patentee will hold out and demand a disproportionate share of the profits. If holding out were deemed misuse, the risk that one patentee would block commercialization would disappear: patentees would be induced to license their patents individually or through pools. The refusal to license important upstream inputs or inventions important to public health could also be deemed misuse. Nevertheless, in recent years the United States has largely decided that conduct that is not regarded as a competition problem should also escape consideration as misuse. Thus, the doctrine has been folded into competition law, which is discussed below.

74 28 U.S.C. §1498.

75 28 U.S.C. §273.

SUMMARY: Defenses to infringement are the most direct way to cure problems in the patent system. They are particularly useful in connection with scientific inputs, such as in the biotechnology, pharmaceutical, and IT sectors, and for refusals to license locally on reasonable terms.

D. Remedies

There are three main remedies to infringement: injunctive relief, monetary damages, and control over importation. All are required by TRIPS, but the WTO accords a great deal of deference to national choices. Authorities must "have the authority" to award relief, but they need not exercise that authority in every case, so long as the over-all scheme deters infringement. Thus, the three forms of relief offer ways to deal with problems arising in particular sectors.

1. Injunctive Relief

Because intellectual property is a right to exclude third parties, the injunction is the premier form of relief in that it restores exclusivity. Nonetheless, in recent years, the United States Supreme Court has emphasized the equitable nature of injunctive relief. In ebay v. MercExchange, it held that before a court may grant an injunction, it must consider the public interest.[76] This decision is particularly important in the IT sector, where we saw that the indeterminacy of software claims, the difficulty in searching the prior art, and the number of patents needed to bring a product to market (especially in the semiconductor segment of the industy) can cause very difficult problems, such as the vulnerability of independent inventors to suit, opportunistic litigation by nonpracticing entities, and holdup problems. Refusing to grant injunctions (and instead requiring the payment of royalties) is, in some ways, the functional equivalent of compulsory licensing. Knowing that an injunction will not be awarded, patentees will be more likely to negotiate deals on their own rather than have the court calculate royalties.

Arguably, however, this approach, which works ex post (i.e. after a suit is fully litigated). is inferior to one that permits courts to award compulsory licenses ex ante (that is, before resources are invested in infringing activities). For example, it cannot cure problems in the medical sector, where refusals to license can reduce access to medicine or to diagnostics: no one will invest in manufacturing or diagnostic equipment without knowing whether the court will withhold injunctive relief. In the United States, however, there is a limited alternative: health care providers who are guilty of infringement are not required to cease activities or to pay royalties. Instead, actions for contributory infringement or induced infringement

76 eBay Inc. v MercExchange, L.L.C., 547 US 388, 391 (2006) ("a plaintiff seeking a permanent injunction must satisfy a four-factor test before a court may grant such relief. A plaintiff must demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction").

can be brought against parties who supply critical inputs, knowing they will be used for infringing purposes.[77]

2. Monetary Damages

Monetary damages are awarded to make the patentee whole for past infringements and to deter infringement. In recent years, a great deal of attention has focused on the calculation of damages, particularly in the IT sector. One problem is that if damages are calculated based on what the infringer would have paid had he licensed rather than infringed, there will be no deterrent effect. But if damages are increased to deterrent levels, then in fields where there are nonpracticing entities, the high level of recovery will attract opportunistic litigation.

Second, when many inputs are needed to bring a product to market, it can be difficult to determine the value the patent invention added to the total product. In the past, patentees were able to recover an amount based on the entire market value of the product. That acted as a tax on innovation and it attracted nonpracticing entities. In Lucent Technologies v. Gateway, the Federal Circuit announced that henceforth, damages will be apportioned, so that a successful defendant will collect only the value its advance contributed to the success of the product.[78]

Third, in cases, such as software, where it is difficult to search prior art, patents will often be infringed inadvertently, yet once the product is sold, it is difficult to replace the infringing component. In such cases, the new approaches to remedies can be combined. An injunction will be denied for a period of time that is sufficient to work around the infringing component. During that time (and to account for past infringement), money damages will be awarded, but the amount will be limited to the value the advance added to the product.

It should also be noted that Richard Posner, the noted critic of patents in the IT sector, recently dismissed a cellphone case when sitting as a district judge, claiming that damages for infringement could not be proved with sufficient certainty.[79]

3. Border Actions

Under TRIPS, members must give customs authority the power to prevent counterfeit and pirated goods from entering the market; they may also bar entry to other goods (art. 51). In the United States, this power is exercised in patent cases only when the patentee makes the invention commercially available (through local working or importation), or is in the process of developing this capacity. In that way, public availability of the invention is somewhat assured (even though the patentee can bring infringement actions against those who make, use, sell, offer to sell, or import the product).[80]

SUMMARY. Adjustments to relief can be used to deal with patent thickets, holdups, and other licensing problems. However, the system is ex post; it is not an efficient way to induce optimum levels of exploitation and licensing.

E. Government-Funded Inventions

In the United States, patents on certain government-funded inventions are subject to special rules on the theory that the public pays for them twice, once in taxes to fund the research, and the second time through the supracompetitive purchase price. These rules further the government's interests in creating new high tech jobs, bringing academia and industry into close contact, and assuring access to government-supported research.

The US government supports research both intramurally (in government laboratories) and extramurally, mostly by financing scientists working in universities and other research institutions. On the whole, the extramural funding is dispensed through peer-reviewed research proposals, a process that is administered by various federal agencies. Rights over the fruits of intramural research are owned and exploited by the government. At one time, the same was true of university-based research: the government took all patent rights and generally licensed them out on a nonexclusive basis. This changed in 1982, when the Bayh Dole Act went into effect.[81]

The Bayh Dole Act seeks to promote the commercialization of federally-supported inventions and collaboration among scientists in universities and industry. The Act retains government ownership as a default position. But it effectuates the goal of bringing academia and industry in closer contact by allowing certain "contractors"—small businesses and nonprofit organizations (mainly universities) that are parties to government funding contracts – to elect to retain title to inventions that arise from federally funded research. If neither the funder nor contractor wishes to patent, the inventor may pursue patent rights. The rights acquired are subject to various constraints.[82] Funding agreements can exempt foreign contractors and those under the control of another government. A funding agency can also deny rights of election when the research is of national interest or when it determines that government ownership would "better promote the policy and objectives" of the Act.[83] After transfer, the United States en-

77 35 U.S.C. §287 (c).

78 Lucent Technologies, Inc. v Gateway, Inc., 580 F.3d 1301 (Fed. Cir. 2009).

79 Apple, Inc. v Motorola, Inc., 869 F.Supp.2d 901 (N.D.Ill. 2012) (Posner, J., sitting by designation).

80 See 19 U.S.C. §1337. Importation actions are brought in a special tribunal, the International Trade Commission.

81 35 U.S.C. §§200–212. See also 15 U.S.C. §§3701–3714 (the Stevenson-Wydler Technology Innovation Act of 1980), which applies to certain entities other than universities.

82 §202 (a), (c) & (d).

83 §202 (a) (i) – (iv).

joys a nonexclusive, nontransferable license to practice or allow others to practice the invention on its behalf; funders can also demand similar rights under foreign patents.[84] Periodic reporting of commercialization efforts is required;[85] if the funder determines that the invention has been insufficiently exploited, it can "march in" and acquire rights to the invention.[86] Government retention or reacquisition is not, however, easy: there are cumbersome requirements and a right of review. In fact, the United States has only rarely withheld patent rights and has never successfully marched in, even in situations where the right was clearly underexploited.[87]

The Act imposes certain other safeguards as well. The contractor must ensure that rights can be secured.[88] Significantly, it must share the royalties received with the inventors; in most cases, it must plow its profits back into support for scientific research or education; excess earnings (measured by comparing profits to institutional budgets) must be returned to the US Treasury; licensing programs must prefer small businesses and US industry.[89] If reasonably possible, all exclusive licenses must be to entities that agree to produce products embodying the invention or using the invention "substantially in the United States."[90] The Act thus assures that faculty members are motivated to participate in licensing activities, that there is enough contact among the parties to promote a healthy interchange of ideas and skills, and that the public's tax expenditures an redound to the benefit of the US taxpayer through both better products and better jobs.

The Act's main significance has been in the biotech sector, where much of the research is conducted by universities with support from the National Institutes of Health (NIH). As we have seen, biotech and medical research may be impeded by the many fundamental research and medical inputs are patented (DNA, research tools). Because the safeguards in the Bayh Dole Act have not been used and United States does not recognize a general research exemption, the NIH has sought to impose limitations through its funding agreements. It has asked universities to license nonexclusively (or by field of use) when possible – usually, when the invention is close enough to commercialization that the licensee need not to invest significant resources. In that way, NIH seeks to increase competition and reduce the risk of holdups. Some funding agreements require universities to state their plans for exploitation and dissemination of the work they do. In addition, many universities have voluntarily undertaken to license in ways that safeguard public interests.[91]

84 § 202 (c) (4).
85 § 202 (c) (5).
86 § 203.
87 Arti K Rai and Rebecca E Eisenberg, 'Bayh-Dole Reform and the Progress of Biomedicine' (2003) 66 Law and Contemporary Problems 289.
88 35 U.S.C. § 202 (c) (1) & (2).
89 § 202 (c) (7).
90 § 204.
91 AUTM, 'Nine Points to Consider in Licensing University Technology' (6 March 2007) <http://www.autm.net/Nine_Points_to_Consider.htm> accessed 1 August 2011.

III. THE INTERACTION BETWEEN COMPETITION LAW AND IP LAW

A. Legal Framework and Goals of Competition Law

Competition law (or antitrust law in the United States) developed as a separate area of law in the late 19th century, when US Congress enacted the Sherman Act in 1890 with the aim to prohibit certain business activities deemed to be anticompetitive, in particular cartels (Section 1 of the Sherman Act) and monopolization (Section 2 of the Sherman Act). Although the Sherman Act today still forms the basis for most antitrust litigation, US Congress enacted the Clayton Act (which specifically prohibited exclusive dealing agreements, tying agreements and interlocking directorates, and mergers achieved by purchasing stock) and the FTC Act in 1914 (establishing the Federal Trade Commission and providing it with the power to investigate and prevent deceptive trade practices (Section 5 FTC Act). US antitrust law is enforced by the generalist courts (at the federal and state level), the Federal Trade Commission and the Department of Justice-Antitrust Division (for criminal investigations, such as cartels).

Established by the Treaty of Coal and Steel in 1951 and the Treaty of Rome on the European Economic Community in 1957, the competition law provisions of the European Union (EU) Treaties have remained largely unchanged since, despite the various modifications of the constitutive Treaties and the merging of the European Economic Communities within the European Union in the Treaty of Lisbon in 2009. Article 101 (1) of the Treaty on the Functioning of the European Union (TFEU) prohibits agreements, concerted practices and decisions of associations of undertakings that have as their object or effect to restrict competition and affect trade between Member States. The different elements of Article 101 (1) have been interpreted by the extensive case law of the European courts. Article 101 (3) provides that practices that fall within the scope of article 101 (1) may not be found illegal under Article 101 and are thus not subject to the prohibition principle if they contribute to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting economic benefit. In order to benefit from Article 101 (3) restrictive agreements should not impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives or should not afford such undertakings the possibility of eliminating competition in respect of a substantial part of the products in question. Article 101 (2) TFEU deals with some of the civil law effects of Article's 101 (1) prohibition. The Commission benefits from a broad regulatory competence in adopting measures of general application. The Commission has, indeed, adopted regulations that exempt categories of agreements from the prohibition of Article 101 (1), under Article 101 (3), in specific circumstances. These texts are completed by an array of guidelines, communications, notices, priority guidance, best practices, annual reports, oral statements, press releases, guidance letters, expert reports and third party studies, which provide invaluable information for the enforcement of competition law. Article 102 prohibits the abuse by one or more undertakings of a dominant position within the internal market or in a substantial part of it in so far as it may affect trade between Member States. Both articles 101 and 102 provide examples of prohibited or abusive conduct. However, this list is not exhaustive and the case law of the European courts as well as the decisional practice of the Commission show an extensive interpretation of these provisions, leading, for example, to the expansion of the application of article 102 to situations where the dominant position is detained by more than one undertakings (collective dominant position) or to situations where the abuse and the dominant position are not on the same relevant market. The Court's case law has not expanded the application of Article 101 TFEU to situations of tacit collusion if there is no evidence of some degree of concentration between the undertakings: parallel behavior does not constitute evidence of an illegal concerted practice or agreement. There was no effective system of merger control in the European Communities,[92] at least until the first EC Merger regulation (ECMR) was implemented in 1989.[93] The regulation established a centralized preventive and one-stop shop merger control system with a suspensory (to unauthorized mergers) effect. The competence for the examination and the decision in merger cases with a Community dimension lies exclusively with the European Commission. Member States are free to develop their own merger control systems for mergers without a Community dimension. This report focuses on the application of Articles 101 and 102 TFEU to practices involving IP rights and does not examine merger control, although some of the issues raised are similar. EU competition law is enforced by the European Commission (in particular the Directorate General for Competition or DG Comp), national competition authorities and national courts of the EU Member States. The Court of Justice and the General Court of the EU interpret the provisions of EU competition law and (for the General Court) perform a control of legality to the decisions of the European Commission in this area.

The view that competition law should aim to promote some form of economic welfare is intrinsically linked to the influence of economics and in particular welfare economics, consumer theory and related fields in competition law analysis and is valid for both US antitrust law and EU competition law. There are different views over the meaning of economic welfare and how this may be measured. First, competition authorities and courts may examine the efficiency of a change from one competitive situation to another adopting a "total welfare standard". The latter is a measure that aggregates the surplus of different groups in the economy (e.g. producers, consumers) and measures the welfare consequences of the change. It is important that total (consumer and producer)

92 Neither the Treaty of Rome nor the German GWB provided any specific provision for controlling mergers, with the exception of Art. 66 (1) – (6) of the European Coal and Steel Community (ECSC) Treaty, which established an exclusive competence for the High Authority of the ECSC without any residual competence to Member States for establishing national merger control and without the requirement of an effect on trade between Member States.

93 Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings [1989] L395/1. The case law of the European court of Justice had however extended the scope of application of Articles 101 TFEU (Joined Cases 142 and 156/84 BAT and Reynolds v Commission [1987] ECR and 102 TFEU to economic concentrations.

surplus increases, even if the surplus of one of the groups (consumers or producers) diminishes. Only the size of the economic pie matters, not its distribution among each group. From a total welfare perspective the objective of competition law enforcement should be to ensure the maximum level of efficiency for all these categories. This includes allocative efficiency, for example, the possibility for consumers to pay a price that corresponds to their willingness to pay or in some cases less than their willingness to pay (leading to consumer surplus). It should also include the possibility for producers to use production processes that yield the highest output levels for a given set of inputs or for consumers the possibility to enjoy innovative products and services, what is usually referred to as dynamic efficiency. Finally, one should take into account the scale efficiencies producers may enjoy, enabling them to reduce the production costs of a specific good (productive efficiency) and thus to raise their surplus in the sense that if a producer has a willingness to sell, and the market price for a good is above that price, then they would be able gain a surplus equal to the gap (producer surplus).

One might take a static view of efficiency (what is the current or short term situation of consumers and suppliers on the market) or a dynamic view which is concerned with the long run evolution of the market (focusing on encouraging research and development). In some circumstances there might be tension between static allocative efficiency and dynamic efficiency. As it is explained in a Canadian Bureau of Competition commissioned report on Innovation and Dynamic Efficiencies,

"(t)o sustain innovative efforts, and thus support dynamic efficiency, firms do not expect to price at short-run marginal cost at every point in time and as a result some degree of allocative inefficiency may be inevitable. Motivating firms to make costly investments in R&D requires some prospect of "profit," which as noted above is in the form of quasi-rents. In the absence of this positive return per unit of output sold, a firm would never be able to recoup its up-front investment in R&D, and would therefore have no incentive to undertake this investment. In other words, innovating firms anticipate a period of "incumbency" during which they are able to sell a product at a price exceeding not only the short-run marginal cost of production, but potentially also the price of existing products (if any) that do not incorporate the innovation. Consumers are willing to pay the higher price because they value the additional attributes embodied in the new or improved product sufficiently to pay a premium for it over other firms' products."[94]

It follows that firms engaged in considerable research and development and other innovative activity may have low marginal costs but large fixed costs, which would lead them to price significantly above marginal costs in order to earn a competitive return in the long run. This might at first sight seem in contradiction with the static allocative efficiency concern for lower prices and will certainly deviate from the model of perfect competition. However, from a dynamic total welfare perspective, this sacrifice in static allocative efficiency may be compensated by the benefits flowing from dynamic efficiency: higher profitability for the undertakings and new or better quality products for the consumers in the long run.

Competition law in the United States and to a lesser extent in the EU requires evidence of consumer harm before finding a conduct restricting rivalry or competition on a relevant market to violate the competition law statutes. The concept of "consumer harm" may include multiple dimensions.[95]

(i). In the economic jargon, the protection of consumer surplus constitutes an important part of the total welfare standard test. In this context, consumer surplus denotes the consumer part of the deadweight loss suffered as a result of the restriction of competition. For example, a price increase might lead to a volume effect that would be suffered by a certain category of consumers: because of the price increase some consumers will not be able to buy the product anymore, although past consumption patterns (revealed preferences) indicate that they would have preferred to do so, if the price had not increased. Under this narrow definition of consumer surplus, the overcharge paid by the consumers as a result of the price increase should not be of concern for competition law enforcement, as it constitutes a wealth transfer from the buyers to the sellers. The suppliers may be in a position to compensate (hypothetically, not actually) the loss that consumers have suffered while still being able to compensate with this wealth transfer their own losses following the volume effect (producer surplus). In this configuration the situation will be efficient. [the "consumer surplus standard"].

(ii). It is possible to decide that consumer surplus should be preserved at any cost and thus reject any compensation by the supplier that does not compensate actually and effectively the losses incurred by these consumers as a result of the volume effect [the "narrow consumer welfare standard"].

(iii). There is also an argument to move beyond consumer surplus and include in the analysis the wealth transfer that consumers have incurred because of the overcharges following the restriction of competition. These may not only relate to higher prices but could cover any other parameter of competition, such as quality, variety, innovation. In this case, both the loss of consumer surplus and wealth transfers will be compared to the total efficiency gains pertaining to the supplier (s), thus enabling a cost benefit analysis of the effect of the conduct on the welfare of a specific group of market actors, direct and indirect consumers (not all market actors). The idea is that

94 Andrew Tepperman and Margaret Sanderson, 'Innovation and Dynamic Efficiencies in Merger Review' (Canada, Competition Bureau 2007), available at <http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02378.html#key_concepts> pp. 6–7, accessed at 28 April 2013.

95 Part of the analysis in the following paragraphs draws on Ioannis Lianos 'Some Reflections on the Question of the Objectives of EU Competition Law', CLES Working Paper Series 3/2013 (2013), available at <http://papers.ssrn.com/sol3/papers.cfm?abstract id=2235875>, accessed at 28 April 2013.

following the change from an equilibrium situation to another, the consumers of the specific product will benefit from a surplus and/or wealth transfer, in the sense that their ability to satisfy their preferences will increase. [the "extended consumer welfare standard"].

(iv). Some authors also argue that competition authorities should aim to preserve an optimal level of "consumer choice", defined as "the state of affairs where the consumer has the power to define his or her own wants and the ability to satisfy these wants at competitive prices."[96] This concept seems broader than the concepts of "consumer surplus" and "consumer welfare" (the latter including consumer surplus + the wealth transfer because of the overcharge) as it may include other parameters than price, such as quality, variety and innovation. The same authors have used interchangeably the term of "consumer sovereignty", which is defined as "the set of societal arrangements that causes that economy to act primarily in response to the aggregate signals of consumer demand, rather than in response to government directives or the preferences of individual businesses."[97] Defining the "optimal degree" of consumer choice or consumer sovereignty and measuring it using some operational parameters seems however a daunting task. Consumer sovereignty may be conceptually appealing but may prove empirically weak to implement in competition law enforcement. One might be obliged to go a step further and claim that consumer sovereignty can be preserved by the ability of consumers to influence the characteristics of the product bundle according to their own hypothetical revealed preferences. Hypothetical revealed preference theory defines an agent's preferences in terms of what she would choose if she were able to choose, thus switching from actual to hypothetical choice.[98] The way this theory will work in practice is still a matter of speculation. It is clear that consumers are influenced in their decisions by "the context of choice, defined by the set of options under consideration. In particular, the addition and removal of options from the offered set can influence people's preferences among options that were available all along."[99] The firms with their marketing activities may, for example, shape endogenously consumer preferences by establishing an artificial selection process, "preferences are actually constructed – not merely revealed."[100] A greater focus on consumer sovereignty may thus, in some cases, lead to more intensive competition law intervention to establish the parameters of independent consumer choice and specific presumptions against commercial practices that deny the sovereignty of consumer choice. Open and contestable markets are a prerequisite for the empowerment of consumers. The consumer choice or consumer sovereignty standard may also accommodate the psychological aspect of the formation of these preferences, which is usually ignored in neoclassical price theory. The integration of behavioral economics' evidence in order to understand the consumers' behaviour and build counterfactuals of hypothetical choice, based on predictions about what someone would choose in a specific choice context may also be one of the implications of this theory.

In competition law, the aim of protecting consumers implies that the outcome/consequences of a specific practice on consumers matters, before any decision on the lawfulness or unlawfulness of this practice has been reached. A reduction of competitive rivalry, following the exclusion of a competitor or an agreement between two competitors to cooperate with each other, will not be found unlawful, if they do not also lead to a likely consumer harm or consumer detriment. A different approach would take a deontological perspective emphasizing competitive rivalry (and the protection of the competitive process as such), irrespective of any actual or potential consequences of the specific practice/conduct on consumers. Effects may indicate empirical observable findings on the worsening, in terms of price or quality, of the situation of specific groups of consumers, following the adoption of the anticompetitive practice (actual effects). It may also refer to situations where there are no observable findings of effects on these groups of consumers but there is "a consistent theory of consumer harm" which is empirically validated: that is, "the theory of harm should be consistent with factual observations" (ex ante validation) and "that the market outcomes should be consistent with the predictions of the theory" (ex post validation).[101] The theory of harm has the objective to establish a relation of causality between the specific practice and the consumer detriment. One could think in terms of a probability-statement, that is, an evaluation of the "inferential soundness" of this relationship, or in terms of relative plausibility of the specific consumer harm story.

The operation of static and dynamic approaches in assessing the effect of a practice on consumers is trickier than when one adopts a total welfare standard, hence not focusing on a specific category of actors. Turning back to our previous discussion of the tension between static and dynamic efficiency, it is arguable that increasing R&D does not necessarily lead to socially optimal innovation, as firms might have an excessive incentive (relative to that which is socially optimal) to seek to replace other firms ("the business stealing effect").[102] As it is noted by the Canadian Bureau of Competition commissioned report on Innovation and Dynamic Efficiencies, "consumers do not derive benefits from an additional dollar of R&D spending unless that dollar results in an increased likelihood of either a new product being developed or an ex-

96 Robert H Lande, 'Consumer Choice as the Ultimate Goal of Antitrust' (2001) 62 (3) University of Pittsburgh Law Review 503, 503.

97 Neil W Averitt and Robert H Lande (1997), 'Consumer Sovereignty: A Unified Theory of Antitrust and Consumer Protection Law' (1997) 65 Antitrust Law Journal 713, 715.

98 For a critical analysis see, Dianel M Hausman, Preference, Value, Choice, and Welfare (Cambridge University Press 2012) 31–33, citing as the main proponent of this theory Kenneth G Binmore, Game Theory and the Social Contract: Playing Fair (MIT Press 1994).

99 Eldar Shafir, Itamar Simonson and Amos Tversky, 'Reason-Based Choice' (1993) 49 Cognition 11, 21.

100 Ibid 34.

101 Penelope Papandropoulos, 'Implementing an effects-based approach under Article 82' (1998) Concurrences 1, 3.

102 Tepperman and Sanderson (n 94) 8.

isting product being made available for a lower price".[103] In other words, what is important is not to focus on R&D but on the innovation process and its outcomes. However, from a total welfare perspective, the cost to consumers of the increase of innovative activity is only one component of the analysis, the other being the profits that undertakings derive from the R&D activity long run. A change will thus be deemed efficient, even if there is over-investment on R&D, with regard to what is socially optimal, should the firm's profitability increase as a result of this R&D effort, enabling it to potentially compensate the consumers' loss.[104]

An important issue that has been examined from time to time in the case law of the European Courts and the decisional practice of the European Commission is if competition law and policy is an objective of EU law or is it also a means to further other objectives of EU Law. Initially, competition law and policy had been conceived as a means to enhance the objective of establishing a common (Internal) market. This "outer" aim of competition policy might explain the teleological and extensive interpretation of the competition law provisions of the Treaty that the European courts have followed in a number of cases against private or public practices that raise barriers to trade and restrict competition.[105] The objective of market integration has influenced the Courts in the interpretation of the competition law provisions of the Treaty, also in its recent case law.[106]

B. The Intersection Between Competition Law and Intellectual Property: Principles

1. The Thesis of a "Unified Field" and the Persistence of Conflicts

Even if one adopts the view that intellectual property law and competition law pursue the common and sole objective of economic welfare, there may still be instances of conflict between the two. This mainly occurs in situations of cumulative innovation or when IP is used strategically in order to exclude competitors and harm consumers.

a. Competition law, IP rights and the common objective of economic welfare

By granting an exclusive right, intellectual property offers the opportunity to the right holder to earn extra profits. The consumers of the particular good embodying the IP right will consequently lose because the level of output of the particular good will be lower than would have been the case in the absence of an exclusive right. The tension between intellectual property and competition policy will be even more significant if the objective of the latter is also to maximise consumer welfare by limiting money transfers from the consumers to the IP rights holder. However, if the IP owner did not have the opportunity to overprice his product, there would be suboptimal incentives to commit resources to investment at the first place. In the absence of intellectual property rights, the product would simply not exist and the consumers would benefit from less innovation.

It is not clear what the term "innovation" covers but we will define it broadly as referring to an "economic change" or development that is not generated by the spontaneous evolution of consumers' needs but is instead engendered by the producers. This covers, according to economist Joseph Schumpeter the following five cases:

"(1) the introduction of a new good – that is one with which consumers are not yet familiar – or of a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or half-manufactured goods, again irrespective of whether this source already exists or whether it has first to be created. (5) The carrying out of the new organization of any industry […]."[107]

Not all type of innovation should, however, be protected by intellectual property rights on this analysis; only those whose value to the consumers is more important than the cost of the IP protection.

103 Ibid 9.

104 A total welfare approach could also look to the possible effects of innovation across markets, so not only the effects on suppliers and consumers present in the specific relevant market, hence performing some form of general equilibrium analysis. General equilibrium analysis focuses on the economy as a whole and studies economic changes in all the markets of an economy simultaneously.

105 Cf: Case 56 & 58/64, Consten & Grundig v Commission [1966] ECR 299 applying Article 85 of the EC Treaty (now Art. 101 TFEU) to distribution practices establishing vertical restraints to competition.

106 Cf: Joined Cases C-501/06 P, C-513/06 P, C-515/06 P and C-519/06 P GlaxoSmithKline Services Unlimited v Commission [2009] ECR I-929 (finding that a dual pricing system restricting the opportunities of parallel trade constituted a restriction of competition by its object under Article 101 TFEU); See also, Joined Cases C-468/06 to 478/06, Sot. Lelos kai Sia v GlaxoSmithKline [2008] ECR (where the Court examined the compatibility to Article 102 TFEU of a refusal to supply wholesalers engaging in parallel exports. The Court implicitly recognized that certain types of conduct, such as a restriction of parallel trade are presumptively anticompetitive, because they frustrate the objective of the Treaty to achieve the integration of national markets through the establishment of a single market); Case 13/77, INNO / ATAB (1977) ECR 2115 (extending the application of the competition law provisions of the Treaty to state restrictions of competition).

107 Schumpeter (n 6) 66. 'The European Commission seems also to adopt this broad definition of "innovation" in its 1995 'Green Paper on Innovation' COM (1995) 688 final (The Commission defined innovation as "the renewal and enlargement of the range of products and services and associated markets; the establishment of new methods of production, supply and distribution; the introduction in changes in management, work organization and the working conditions and skills of workforce").

It is therefore important to balance the respective effects of competition law and intellectual property on consumer welfare. The trade-off between the long-term effects of IP rights on incentives to innovate and their short-term effects on output and prices is not however an easy task. Indeed, in theory, intellectual property law focuses more on the long-term effects, while competition law's focal point is primarily on the short-term effects of a business practice to "consumer welfare".

This is not to argue that competition law ignores the long-term effects brought by greater innovation to economic welfare.[108] The European Commission's Guidelines on the application of article 81 (3) of the Treaty examine the effects of a particular agreement on innovation[109] while they also integrate dynamic efficiencies as possible compensating factors of an otherwise anticompetitive agreement, which restricts output and increases prices.[110] The "balancing test" that the Commission applies aims to ensure that these "qualitative efficiencies", such as new and improved products, will create "sufficient value for consumers to compensate for the anti-competitive effects of the agreement, including a price increase".[111] This is because the availability of new and improved products constitutes an important source of benefits to consumers.[112] However, the assessment of pro and anti-competitive effects is an arduous task as it is difficult to assign precise values to dynamic efficiencies in order to conduct a cost benefit analysis and assess the effects of a practice to "consumer welfare".[113]

What are the implications of a strong intellectual property protection to total and consumer welfare? By offering the possibility to the IP holder to increase prices, IP rights may decrease output and therefore total welfare. However the dynamic efficiencies brought by IP may largely compensate the losses. The effect of IP to consumer welfare is a more complicated issue and depends on the extent the "monopolistic" profits generated by the exclusive right of the IP holder will be passed on to the consumers in one way or another. This will not necessarily take the form of lower prices, but also of better quality, new products or services and extended consumer choice.

108 See Commission Notice- Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements, [2004] OJ C 101/2, ("both bodies of law share the same basic objective of promoting consumer welfare and an efficient allocation of resources. Innovation constitutes an essential and dynamic component of an open and competitive market economy. Intellectual property rights promote dynamic competition by encouraging undertakings to invest in developing new or improved products and processes. So does competition by putting pressure on undertakings to innovate. Therefore, both intellectual property rights and competition are necessary to promote innovation and ensure a competitive exploitation thereof").

109 Guidelines on the application of article 81 (3) of the Treaty [2004] OJ C101/97, paras 24 to 25.

110 Ibid para 70.

111 Ibid para 102.

112 Ibid para 104.

113 Ibid para 103.

b. Intellectual property, competition and cumulative innovation

A system of strong IP protection may nevertheless harm consumers in the long run by restricting cumulative innovation. This situation raises two issues: the importance of cumulative innovation to economic welfare and the relation between innovation and market structure, as it is not necessarily true that a competitive structure will generate more innovation than a more concentrated one.

As we have previously explained, one can distinguish between two types of innovation: "stand alone innovation", which refers to the situation where the IP right will not be used as an input to another innovation, and "cumulative innovation", which refers to the situation of successive innovations built upon earlier innovations. It is widely accepted that cumulative innovation substantially increases social value. Public authorities recognise this reality by establishing innovation clusters, such as the Silicon Valley in the United States, which provide the possibility for information exchange and the development of research synergies.[114]

Cumulative innovation may take different varieties: either the second innovation could not be invented without the first, or the first innovation reduces the cost of achieving the second, or finally the first innovation accelerates the development of the second by providing new research tools.[115] The social value of the innovation process is, in each of these forms, unequally distributed between the first and the second innovator. It will be important to find the right incentive mechanism in order to ensure that earlier innovators are compensated adequately for establishing the foundations for later innovators, while also making sure that cumulative innovators still have an incentive to invest. The original design of intellectual property rights should therefore take into account the need to compensate both the initial and the subsequent innovators.

It is however impossible in practice to consider ex ante all the possibilities of cumulative innovation in designing the initial intellectual property rights. By definition, cumulative innovations did not exist the time the IP rights were granted to the initial innovator. Confronted with demands of subsequent innovators to use the first-generation innovation, the IP holders face a strategic choice: either they will encourage cumulative innovation or they will refuse to license their inventions and therefore block innovation. They may have an interest in refusing only if the cumulative innovator may be in a position to compete with them in the market of the second-generation product or in the market of the first-generation product covered by the IP right. This will indirectly affect consumers as, in the absence of cumulative innovation, they will not benefit from new products and services. However, by refusing to license the IP rights, holders of the first-generation prod-

114 For an analysis of the Silicon Valley model in product system development, see Masahiko Aoki, Towards a Comparative Institutional Analysis (The MIT Press 2001) 347.

115 Suzanne Scotchmer 'Standing on the Shoulders of Giants: Protecting Cumulative Innovators' in Suzanne Scotchmer, Innovation and Incentives (MIT Press 2005) at p. 139.

uct incur the risk that their rivals will develop in the future a competing technology, which will provide an alternative to the first-generation innovation.

It should also be noted that the initial design of intellectual property rights will also affect the bargaining position of the parties to the licensing agreement. Usually the IP right holder will not have any interest in refusing to license. There is an important body of literature explaining that in high technology sectors, competitors usually share information by publishing their research and do not systematically have recourse to intellectual property protection in order to appropriate part of the social value created by cumulative innovation.[116] The revenues that an initial inventor can derive from cumulative innovation via licensing are considerable.

Nevertheless, the private interest of the IP right holder will not always coincide with the goal of promoting cumulative innovation. In such circumstances, it may be expected that the IP right owners would likely decide to exclude competition. The simple fact that the refusal to license will make possible the exclusion of rivals from the market is not enough to infer a competition law infringement. It is also important to plausibly claim a theory of anticompetitive effects.

c. Exclusionary theories of anticompetitive effects and intellectual property rights

Economists have advanced a number of theories of anticompetitive effects explaining why even a unilateral practice may raise competition law concerns. Even if these theories apply to different settings, it is submitted that the anticompetitive effects may be reinforced in the presence of IP rights, if the later are used strategically in order to control a network and as a result restrict competition and innovation. We focus here on practices that produce anticompetitive effects and consumer harm by excluding competitors, as both US antitrust law and EU competition law apply to these practices. Some legal systems (such as EU competition law) also apply to practices that produce directly consumer harm, without the exclusion of a competitor (e.g. excessive prices, price discrimination), the so-called exploitative abuses.

(i) The leverage theory

One of the most controversial doctrines of anticompetitive effects is the leverage theory, which explains that, by refusing to license, the monopolists seek to extend their monopoly power to a downstream related market.[117] This theory was criticised by the Chicago school of antitrust economics, which argues that an upstream monopolist has no interest in leveraging its monopoly power to a related market because it is possible to gain only one monopoly profit overall (single monopoly profit theorem).[118] As a result, the leverage theory lost its appeal as an autonomous basis for action, in the United States,[119] although it still retains some significance in Europe.[120]

The economic grounding of the theory has nevertheless been revisited lately. Whinston criticised the assumptions of the Chicago school and argued that, in certain circumstances, a monopolist in a market A may follow a leveraging strategy by using tying practices as a commitment device in order to signal to its actual or potential competitors in the downstream market B that they will face aggressive competitive behaviour, which will eventually decrease their profits.[121] The potential rivals will thus be less inclined to enter the market or be excluded from it, if they were present. This strategy is profitable if the tied goods are complements in fixed proportions to the goods in market A.

Choi and Stefanadis also developed a model in which the incumbent firm may have the interest to extend its monopoly from one market to another if the two products are complements and the new entrant can effectively enter the market for one of the two product only if it has successfully innovated in both markets.[122] The cumulative innovators would therefore be prevented from capturing the social value of their innovation in one market before they also innovate in the second market. This will decrease their incentives to engage in innovation at the first place with the result that the dominant firm's strategy will pre-empt the emergence of cumulative innovation.

(ii) The essential facilities doctrine

The essential facilities doctrine is inspired by the leverage theory but presents certain specific characteristics. It is a legal doctrine framed by some early US decisions, which held that under specific circumstances, firms have affirmative duties to assist their competitors.[123] Although never explicitly accepted by the US Supreme Court, the lower courts have set the conditions for the application of the doctrine as requiring from the plaintiff proof of the following four elements: (1) control of the essential facility by a monopolist; (2) a competitor's inability practically or reasonably to duplicate the essential facility; (3) the denial of the use of the facility by a competitor; (4) the feasibility of providing the facility.[124] The Supreme

116 Yochai Benkler, 'Coase's Penguin, or, Linux and the Nature of the Firm' (2002) 112 Yale Law Journal 369.

117 Louis Kaplow, 'Extension of Monopoly Power Through Leverage' (1985) 85 Columbia Law Review 515.

118 Ward Bowman 'Tying Arrangements and the Leverage Problem' (1957) 67 Yale Law Journal 19; Richard Posner, Antitrust Law (University of Chicago Press 2001) 198–200.

119 Verizon Communications, Inc. v Law Offices of Curtis V. Trinko, LLP, 540 US 398 (Trinko case).

120 Case T-201/04 Microsoft v Commission [2007] ECR II-3601

121 Michael D Whinston, 'Tying, Foreclosure and Exclusion' (1990) 80 American Economic Review 837.

122 Jay P Choi, 'Preemptive R&D, Rent Dissipation and the 'Leverage Theory' (1996) 110 Quarterly Journal of Economics 1153; Jay P Choi and C. Stefanadis 'Tying, Investment, and the Dynamic Leverage Theory' (2001) 32 Rand Journal of Economics 52.

123 United States v Terminal R.R. Ass'n, 224 US 383 (1912); Associated Press v United States, 326 US 1 (1945); Otter Tail Power Co. v United States, 410 US 366 (1973) (although the US Supreme Court never accepted explicitly the theory).

124 MCI Communications Corp. v AT&T, 708 F.2d 1081, 1132–1133 (7th Cir. 1983) (MCI case)

Court has recently marginalised the doctrine of essential facilities and it seems that the use of the doctrine of essential facilities in US law has fallen in desuetude.[125] Because the monopolist controls an essential facility (sometimes called bottleneck) he may be able to extend his monopoly power from "one stage of production to another".[126] Under the essential facilities doctrine, a vertically integrated monopolist will be required to share some input in a vertically related market with someone operating downstream. This will only be the case if it is feasible for the monopolist to provide the facility, the competitor would be reasonably and practically unable to duplicate it and the denial of the use of the facility will deprive the competitor of an essential input, thus enabling the dominant firm to extend its monopoly power in a related market. In EU competition law, the Commission first used the concept of "essential facilities" in some decisions on interim measures involving the opening of port facilities to competition.[127]

An essential facility is taken as a facility to which access is essential for the provision of goods or services in a related market and where it is not economically efficient or feasible for a new entrant to replicate the facility. The concept has extended beyond infrastructure (railways, including track and stations; airports, including slot allocation; ground handling services; utility distribution networks e.g. electricity wires and gas pipelines; bus stations; ports) to airline computer reservations systems and in some cases intellectual property rights. There is some debate over the practical use of this doctrine and its added value in view of the quite interventionist approach of competition authorities and courts in Europe with regard to imposing a duty to deal, in comparison to the United States. Some authors have gone as far as analyzing all the case law of the European Courts on unilateral refusals to deal from the prism of the essential facilities doctrine.[128]

Contrary to the traditional leverage theory, the essential facilities doctrine has a structural and not a behavioural component, in the sense that "a monopolist's status (as the owner of the facility and a competitor in the market that relies on the facility) rather than any affirmative conduct determines liability".[129] The application of the essential facilities doctrine has been extended to a wide variety of "facilities" owned or controlled by a monopolist. Commentators seem however to increasingly question the utility of the essential facilities doctrine as a valid basis for antitrust liability[130] and recent case law in the United States has placed important limitations on its use.[131] The doctrine continues nonetheless to retain some significance in Europe.[132]

(iii) Raising rivals' costs

A distinct theory of anticompetitive effects is that dominant firms may use IP rights to create barriers to entry and raise the costs of their rivals.[133] As a result they will be able to increase profitably their prices, up to the level of their rivals and exercise market power, or to profitably undercut rivals' prices and drive them out of the market. IP rights may facilitate strategies of raising rival costs if the technology covered by the IP right is a valuable input.

Rubinfeld and Maness underscore that IP owners may use their IP portfolio strategically to raise their rivals' costs by creating a "patent thicket", which includes patents whose validity is questionable ("submarine patents"), or by adopting a strategy of "patent flooding", in which "a firm files a multitude of patent applications that claim minor variations on a competitor's existing technology".[134] These strategies will have the advantage, according to the same authors, to "require little or no short-run profit sacrifice to achieve the desired long-term goal of lessening competition in the marketplace".[135] They may nonetheless achieve a number of anticompetitive effects, such as foreclosure, predatory pricing and tacit collusion. Indeed, competitors will face a difficult choice: either they will have to litigate the validity of the patents, or they will have to accept a license and pay the fee, or finally they will have to design their products "around the patent".[136] All these practices will increase their costs, reduce their incentives to innovate and facilitate collusive practices as, in most cases, the dispute will lead to an anticompetitive patent settlement[137] or a cross-licensing scheme.[138] The IP owners could also offer a predetermined bundle of licenses to their competitors (package licensing), even if the later do not need the whole package. This will have the effect of limiting their rivals' choice and reducing their incentives to innovate, thus restraining competition in the final goods market.

125 See for instance the position of the Supreme Court in Trinko case (n 119). The Court noted that there are several problems with imposing a duty to deal and with regard to the essential facilities doctrine, it found "no need either to recognize it here or to repudiate it here", noting that the doctrine applies if access is unavailable. That was not the case as the 1996 Telecommunications Act already mandated access. Some lower courts have nevertheless continued to apply the essential facilities doctrine after the Trinko decision.

126 MCI case (n 124).

127 Sea Containers v Stena Sealink [1994] OJ L15/8; See also B&I Line plc v Sealink Harbours Ltd and Sealink Stena Ltd [1992] CMLR 255.

128 See John Temple Lang, 'Defining Legitimate Competition: Companies' Duties to Supply Competitors, and Access to Essential Facilities' (1994) 18 (2) Fordham International Law Journal 437.

129 Herbert J Hovenkamp, Mark D Janis and Mark A Lemley, 'Unilateral Refusals to License in the US' in François Lévêque and Howard Shelanski (eds), Antitrust, Patents and Copyright – EU and US Perspectives (Edward Elgar, 2005) 12 and 18.

130 See Abbott B Lipsky and Gregory J Sidak 'Essential Facilities' (1999) 51 Stanford Law Review 1187, 1191–1192.

131 Herbert J Hovenkamp, Federal Antitrust Policy (3rd ed, Thomson/West 2005) 309–314.

132 Case C-7/97 Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co KG [1998] ECR I-7791.

133 Thomas G Krattenmaker and Steven C Salop 'Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price' (1986) 96 Yale Law Journal 209.

134 Daniel L Rubinfeld and Robert Maness 'The Strategic Use of Patents: Implications for Antitrust' in Lévêque and Shelanski (eds) (n 129) 85.

135 Ibid 87.

136 Ibid 97.

137 Herbert Hovenkamp, Mark D Janis and Mark A Lemley 'Anticompetitive Settlement of Intellectual Property Disputes' (2003) 87 Minnesota Law Review 1719.

138 Cross-licensing may also have anticompetitive effects: Adam B Jaffe and Josh Lerner, Innovation and Its Discontents: *How the Broken Patent System is Endangering Innovation and Process, and What to Do About It* (Princeton University Press 2004) 60.

(iv) Maintenance to monopoly

The theories of anticompetitive effects set out in this section relate to strategies that erode the competitive advantage of the monopolist's rivals in a related market with the aim to extend the monopolist's market power in that related secondary market. An alternative claim of anticompetitive effect is that the dominant firm will seek to maintain its monopoly power on the primary market of the technology covered by the IP right. This maintenance of monopoly claim will usually be integrated in a sequential innovation scheme.[139]

Carlton and Perloff give the example of a two-period setting with a firm that operates in a primary market and a market for a complementary good. Under this example, due to a patent, the firm has, in a first period, a dominant position in the primary market. However, in a second period, the incumbent monopolist faces the risk of entry of an alternative producer into the primary market. According to their model, although the alternative producer has a superior complementary product in both periods, his primary product is of equivalent quality only in the second period.

The strategy of the alternative producer will be to use the profits earned by selling units in the complementary market to cover its fixed costs of entering the primary market. The incumbent monopolist can react by increasing the costs of entry of his rivals in the complementary market. He will achieve this goal by tying the primary product with the complementary product. As a result, the entry of the alternative producer in the primary market at the second period will be deterred. It is not the objective of the strategy to extend monopoly power in the market of the complementary good but simply to preserve market power in the primary product covered by the IP right. Consequently, less innovation will happen in both the primary and complementary products markets.

These different models suggest that, in certain circumstances, IP rights holders will have the interest to deter dynamic innovation that could render obsolete their technological standard.[140] This situation is exacerbated in a network setting, as the IP rights holders will have more incentives to engage in predatory practices in order to control the standard of the network.[141] By doing so, they will not only be able to recoup their investments but also capture the full value of the network. Indeed, the value of a network increases as it grows larger and more firms participate in it. The IP holder will therefore be able to capture value that has been created by the other participants to the network. The objective of IP rights should be to compensate the inventive effort of the IP holder and not to confer a windfall profit.

These anti-competitive effects can only be produced if the IP holder has a monopoly power. This is an important issue as the main objective for granting IP rights is to confer to the IP holder the ability to raise prices. On the contrary, competition law constraints the use of monopoly power.

2. The Focus on Static Allocative Efficiency Analysis in Competition Law

a. IP rights are not monopolies[142]

The history of IP rights highlights the fact that their conception as a form of "property right" is a recent evolution.[143] One could mention the example of patents, which were initially considered as monopoly privileges granted by the sovereign to supporters and favourites as a reward for their loyalty.[144] The excesses of these unjustified grants of privilege led to an increasing unrest of the courts and the legislature, which sought to create boundaries for these exercises of "royal prerogative".

In the case Darcy v Allein, decided in 1602,[145] the Kings Bench applying the restraints of trade doctrine, considered that the grant of an exclusive privilege damages everyone who wants to use the product because the monopolist will raise the price and reduce the quality of the goods and "deprive other workmen of a living".[146] However, the court rendered an exception from the prohibition limited-term patents. This rule was codified by the Statute of Monopolies in 1623, which declared void all monopolies but explicitly excepted from the prohibition, patents granted to the first inventor or inventors of new manufactures, if these were not "contrary to the law, nor mischievous to the state, by raising prices of commodities at home, or hurt of trade, or generally inconvenient".

The collision between the restraints of trade doctrine (being for these purposes an early antecedent of competition law) and what could be considered as the initial steps of patent law has been resolved in recognising the limited circumstances in which patent monopoly grants could be upheld. It is interesting to note that the word "property" was not used and that intellectual property rights were referred to as "privileges". Patents were also to be considered void any time they raised the price of commodities "at home". Their creation was purely motivated by mercantilist reasons (enhance techno-

139 Dennis W Carlton and Michael Waldman 'The Strategic Use of Tying to Preserve and Create market Power in Evolving Industries' (2002) 33 Rand Journal of Economics 194; Choi and Stefanadis (n 122).

140 Dennis W Carlton and Robert H Gertner 'Intellectual Property, Antitrust and Strategic Behavior' NBER Working Paper Series, Working paper 8976, available at < http://www.nber.org/papers/w8976 > last accessed 28 April 2013.

141 Herbert J Hovenkamp, The Antitrust Enterprise – Principle and Execution (Harvard University Press 2005) 277–304.

142 For a more extensive analysis, see Ioannis Lianos 'Competition Law and Intellectual Property Rights: Is the Property Rights' Approach Right?' in John Bell and Claire Kilpatrick (eds) 8 [The Cambridge Yearbook of European Legal Studies (Hart Publishing 2006)] 153.

143 Boudewijn Bouckaert, 'What is Property?' (1990) 13 Harvard Journal of Law and Public Policy 775.

144 Christopher May and Susan K Sell, Intellectual Property Rights – A Critical History (Lynne Reiner 2006).

145 Darcy v Allen (The Case of Monopolies) (1602), Moore (K.B.) 671.; 77 Eng. Rep. 1260.

146 Michael J Trebilcock, The Common Law of Restraint of Trade (Sweet & Maxwell 1986).

logical progress and export trade) and their negative effects on prices strictly limited to foreign trade and consumers.

The use of the term "property" came later when it became clear that there should be some kind of natural rights justification for maintaining this kind of monopoly privilege in the period of laissez-faire that followed the mercantilist era. The evolution of the "monopoly" concept has nevertheless limited the risks of conflict between competition law and intellectual property. As a result if has enfeebled the rationale of the "property rights" rhetoric.

The use of the term "property" does not necessarily confer an absolute antitrust immunity.[147] One of the attributes of property rights is exclusivity. Exclusivity means that the owner of the property has the right to exclude others from exercising his rights of use without permission. The right to exclude was also the cornerstone of the legal conception of "monopoly", before the consolidation of the more economic concept of market power. Indeed, during the most active period of antitrust enforcement that started in United States in the 1930s and also even prior to that, the legal definition of what constituted "monopoly" was still predominant and diverged from the definition of this term by economists.[148] This period also marks the ascendancy of the competition logic after a period of peaceful co-existence between intellectual property rights and antitrust.

If monopoly is considered as a synonym for exclusive right, then by definition the owner of a patent is a monopolist. But if the meaning of monopoly is the condition that generates social loss, in economics this condition is only present "when the demand curve has a negative slope in the region at which output is occurring".[149] This is not always the case for intellectual property rights, as there may be substitute products or technologies, which are not covered by the property rights and could be used instead by the consumers.[150] The owners of the intellectual property rights are therefore limited in their capacity to charge a monopoly price as they should also take into account the competitive pressures exercised by competing products or technologies.

One could also compare the situation with a monopolistic competition equilibrium following some product differentiation. Consequently, terminology can be seen to have an important significance.[151] In this context, the use of the concept of economic rents is a more suitable terminology than the concept of "monopoly" because it highlights the fact that the patent holder benefits from a cost advantage that allows him to make more profits than his rivals but the patent does not necessarily confer him the possibility to restrict output and therefore exercise monopoly power.[152]

The presumption that an intellectual property right may confer monopoly power has been weakened and ultimately abandoned in both US antitrust law[153] and EU competition law.[154] Although there is no presumption that IP rights confer market power, they may however reinforce in EU competition law the inference of a dominant position if the undertaking also enjoys a high market share.[155]

b. The property rights character of IP rights should not provide competition law immunity

One of the side-effects of the conflict between competition law and intellectual property rights is the need to find theoretical justifications for instituting property rights in ideas. It is not the first time that intellectual property is placed in a defensive position. The "literary property" debate of the 18th century and the "patent controversy" of the 19th century, highlighting the collision of copyright and patents with the common law and the principle of free trade, engendered an important debate on the theoretical underpinnings of intellectual property.[156] From these beginnings, it is clear that the narrative of property that appeared in both periods played an "ex post facto role in legitimating" the granting of property rights in ideas. It also served as a useful organising concept for all the different forms of IP rights that have emerged. In more recent times, the adoption of international treaties on intellectual property, within the WTO or the WIPO, has strengthened the importance of IP rights while at the same time restricted governments' discretion to actively apply their competition law statutes.[157]

From this perspective, considered as a form of property, IP rights benefit from a high level of esteem and legal protection that could lead to a weak application or even immunity from competition law enforcement. Property rights are of constitutional value. They are generally protected by the Constitutions of the European Union Member States and by the first additional Protocol of the European Convention of Human rights (ECHR), which is also integrated in European

147 Rudolph J Peritz, 'The "Rule of Reason" in Antitrust Law: Property Logic in Restraint of Competition' (1989) 40 Hastings Law Journal 285, 336.

148 Edward S Mason, 'Monopoly in Law and Economics' (1937) 47 Yale Law Journal 34.

149 Edmund W Kitch, 'Patents: Monopolies or Property Rights?' (1986) 8 Research in Law and Economics 31, 33.

150 Roger E Meiners and Robert J Staaf, 'Patents, Copyrights, and Trademarks: Property or Monopoly?' (1990) 13 Harvard Journal of Law and Public Policy 911; Edmund W Kitch, 'Elementary and Persistent Errors in the Economic Analysis of Intellectual Property' (2000) 53 Vanderbilt Law Review 1727, 1734.

151 Hillary Greene, 'Afterword: The Role of the Competition Community in the Patent Law Discourse' (2002) 69 Antitrust Law Journal 841, 844.

152 Dam (n 7) 250–251. The ability to raise prices profitably and restrict output is also a prerequisite for finding an "exclusionary market power" in situations of raising rivals' costs strategies.

153 Illinois Tool Works Inc. v Independent Ink Inc., 547 US (2006). The Supreme Court abandoned the presumption that a patent confers market power upon the patentee.

154 Case 78/70 Deutsche Grammophon Gesellschaft mbH v Metro-SB-Grossmarketete GmbH & Co., [1971] ECR 487, para 16.; Joined Cases C-241/91 and C-242/91 Radio Telefis Eireann v Commission (Magill), ECR [1995] I-743, para 46.

155 See, Case 85/76 Hoffmann-La-Roche v. Commission [1979] ECR 461, para 42D & 48; Case T-51/89, Tetra Pak Rausing S.A. v Commission [1990] ECR II-309, para 23.

156 On the "literary controversy" see, May and Sell (n 144) 87–97; Sherman and Bently (n 7) 11. On the "patent controversy" see Fritz Machlup and Edith Penrose, 'The Patent Controversy in the Nineteenth Century' (1950) 10 Journal of Economic History 1.

157 See article 31 of the TRIPS agreement. Hanns Ullrich, 'Expansionist Intellectual Property Protection and Reductionist Competition Rules: a TRIPS Perspective' in Keith Maskus (ed), International Public Goods and Transfer of Technology (Cambridge University Press 2005) 726–757.

Union law. The rhetoric of "property rights" therefore plays an important role in legitimating IP rights and in defining a framework for the interface between intellectual property and competition, which is largely biased in favour of IP rights. US law is somewhat different. The Constitution gives Congress the authority to create patent and copyright rights, however, there is no requirement that it do so.[158] However, once a patent or copyright is awarded, it is treated like property.

There are an increasing number of references, in competition law discourse, to the need to establish an analogy between physical property rights and intellectual property. Take for example the US Guidelines for Intellectual Property of 1995 which provide that:

"(t)he Agencies apply the same general antitrust principles to conduct involving intellectual property that they apply to conduct involving any other form of tangible or intangible property".

The European Commission also mentioned in the Microsoft decision that IP rights are "not in a different category to property rights as such". In addition, article 17 of the Charter of Fundamental Rights of the European Union, which has since the Lisbon Treaty legal-binding effect, proclaims the right to property, which is based on Article 1 of the Protocol to the ECHR.[159] The guarantee laid down in subsection 1 of article 17 applies also to IP, mentioned in subsection 2, which emphasizes the analogy drawn between property rights in goods and property rights in ideas. One could remark that the term "rights" is not used for intellectual property, while this is the case for property. However, nothing is mentioned in the second paragraph concerning the possible public interest limits to the scope of intellectual property protection.

It remains however clear that property does not constitute an absolute right. European Union law emphasises the "social function" of property, according to which, property rights can be restricted for reasons of public interest, provided that those restrictions in fact "do not constitute, as regards the aim pursued, a disproportionate and intolerable interference which infringes upon the very substance of the rights thus guaranteed."[160] Competition law constitutes a "general interest" objective that could justify a restriction on the scope of property rights.[161] The terminology of "property rights" does not create an antitrust immunity for IP rights, as their use can be restricted any time they contribute to an infringement of competition law and act against the public interest.

At the same time as being powerless in providing an immunity status to IP rights, the "property rights" rhetoric also does not contribute to the understanding of the necessity of balancing the objectives of reward and dissemination. Indeed, the criterion of "property" is formalistic and does not provide any useful information as to the adequate level of reward and dissemination in order for the scope of the IP right to be optimal.[162] This is clear from proponents of a strong IP protection not referring to the concept of "property right", when attempting to emphasise the instrumental character of intellectual property in order to achieve greater innovation and economic welfare. On the contrary, economists fully adhere to the instrumental approach to property rights and consider property rights as a form of collective action in the marketplace along with other tools such as direct regulation, liabilities, rewards and taxes.[163]

The parallel drawn with physical property is consequently not helpful in determining the adequate balance between reward and dissemination. It is remarkable that both those favouring a less activist antitrust policy against IP rights and those advocating a more careful consideration of the effects of intellectual property protection to competition adhere to the "property rights" logic of intellectual property, while supporting opposite conclusions.[164]

We consider that the analogy with property rights on tangibles is misleading.[165] First, IP rights have distinct characteristics not present in physical property rights. Information may be considered as a pure public good as the "consumption" of information by one person does not diminish the possibility of its consumption by another. Simultaneous (or joint) consumption is also possible. The necessity to confer property rights in order to avoid congestion externalities, which is the usual rationale for physical property rights, is not therefore compelling.[166] The overuse of the information by free riders may nevertheless decrease the value of the resource for the inven-

158 US Const. Art. 1, §8.

159 According to article 17 of the Charter, "1. Everyone has the right to own, use, dispose of and bequeath his or her lawfully acquired possessions. No one may be deprived of his or her possessions, except in the public interest and in the cases and under the conditions provided for by law, subject to fair compensation being paid in good time for their loss. The use of property may be regulated by law insofar as is necessary for the general interest. 2. Intellectual property shall be protected."

160 Case 265/87 Herman Schräder HS Kraftfutter GmbH v Hauptzollamt Gronau [1989] ECR 2237, para 15.

161 FAG-Flughafen Frankfurt/Main AG, 98/190, OJ [1998] L 72/30, para 90. This is also a conclusion reached by the advocate general George Cosmas in Case C-344/98 Masterfoods Ltd. v HB Ice Cream Ltd. [2000] ECR I-11369.

162 Steve Anderman, 'Does the Microsoft Case offer a New Paradigm for the Exceptional Circumstances Test and Compulsory Copyright Licenses under EC Competition Law?' (2004) Competition Law Review 7, 22.

163 Steven Shavell, Foundations of Economic Analysis of Law (Belknap Press of Harvard Univ. Press 2004) 93–94; See also Richard Posner, Economic Analysis of Law (6th ed, Aspen 2003) 47 (distinguishing between "formal property rights" and the way economists describe them as "every device – public or private, common law or regulatory, contractual or governmental, formal or informal – by which divergences between private and social costs or benefits are reduced"); James E Krier 'The (Unlikely) Death of Property' (1990) 13 Harvard Journal of Law and Public Policy 75, 76 and 78 ("(regulation and property) are simply variations in a more general category of operational techniques. Property is just a system of regulation and vice versa").

164 Comp. Cyril Ritter, 'Refusal to Deal and Essential Facilities: Does Intellectual Property Require Special Deference Compared to Tangible Property?' (2005) 28 World Competition 281; Simon Gevenaz, 'Against Immunity for Unilateral Refusals to Deal in Intellectual Property: Why Antitrust Law Should Not Distinguish Between IP and Other Property Rights' (2004) 19 Berkeley Technology Law Journal 741 who take a more activist antitrust standpoint with Christian Ahlborn, David S Evans and Jorge A Padilla 'The Logic & Limits of the "Exceptional Circumstances Test" in Magill and IMS Health' (2004) 28 Fordham International Law Journal 1109.

165 See, Ioannis Lianos 'Competition Law and Intellectual Property Rights: Is the Property Rights' Approach Right?' in John Bell and Claire Kilpatrick (eds) 8 [*The Cambridge Yearbook of European Legal Studies* (Hart Publishing 2006)] 153.

166 Mark A Lemley, 'Property, Intellectual Property and Free Riding' (2005) 83 Texas Law Review 1031.

tors who will find it more difficult to recoup their fixed costs. As a result, their incentives to innovate will diminish and the level of provision of this good would be below the socially efficient level.[167] Granting a property right on information requires a trade-off between the need to encourage innovation and the adequate dissemination of the innovation.[168] This is an important difference with physical property rights and highlights the inherent instrumental character of intellectual property. Second, the intervention of the public authorities is also more systematic and intensive for IP rights than for tangible property rights.[169] For example, the examination of the conditions of patentability is done by a specialised regulator, the Patent Office. This highlights the most important difference between intellectual property rights and property rights on tangibles: the intervention of an independent regulatory agency. By considering that certain intellectual property rights such as patents are not common law rights but simple creations of an administrative process, it is possible to argue that they should not benefit from the thesis of the efficiency of common law and that they can be the outcome of a regulatory capture.[170]

3. Standards for the Interaction Between Competition Law and IP Rights

Standards for the intersection between competition law and IP rights in Europe and the US have initially taken a formalist perspective focusing on the scope of the IP rights, their value or their essential function.[171] This did not rely on a case-by-case analysis of the economic effects of the interaction between competition law and IP rights on incentives to innovate or the dissemination of the invention but on a formalistic analysis of the scope of the IP right, its value, its essential function or the intent of the patent holder. Most recently, competition authorities in Europe and in the United States have opted for a balancing approach that compares welfare effects between, on the one hand static allocative efficiency and, on the other hand, dynamic efficiency on a case by case basis. These tests, although more economically oriented than the formal standards focusing on the scope of the IP rights, are difficult to apply in practice and may lead to favour competition law over IP rights in most circumstances.

a. Formalistic standards for the IP/Competition Law interface

(i) Standards focusing on the scope or value of the IP right

Standards focusing on the scope of the IP rights have taken different forms. First, the inherency doctrine, or limited license doctrine, protects the practices inherent to the exercise of the IP right from the application of competition law.[172] For example, "an output restriction imposed on licensees is encompassed by the patent holder's right to refuse to license to manufacturers altogether".[173] In Bement, the Supreme Court recognized the right of a patent holder to impose price restrictions on licensees, as the patent holder disposes the right to charge any price (even monopolistic) if it would reserve the market to itself.[174] According to the Court, "(t)he object of the patent laws is monopoly, and the rule is, with few exceptions, that any conditions which are not in their very nature illegal with regard to this kind of property, imposed by the patentee and agreed to by the licensee for the right to manufacture or use or sell the article, will be upheld by the courts, and the fact that the conditions in the contracts keep up the monopoly, does not render them illegal".[175] The doctrine was extended in order to grant antitrust immunity to patent holders imposing tying restrictions to their licensees, forcing them to limit the use of the patented product with unpatented products supplied by the patent holder.[176] The assumption was that if the licensees were happy to accept this additional burden it is because of the competitive superiority of the patented invention that provided the right to the patent holder to control the market for unpatented goods. The impact of this jurisprudence was to extend the rights of the patent holder to exclude, use and control a market of unpatented goods. The inherence doctrine, very favorable to the interests of patent holders, was abandoned following the introduction of the Clayton Act 1914 in which tying clauses restricting competition were made illegal, irrespective of whether they concerned patented or unpatented goods.[177] The Supreme Court overruled Dick in Motion Picture Patents referring to the Clayton Act, in which the Court condemned a licensing provision requiring operators of motion picture projectors to screen film only produced by the manufacturer[178] and confirmed in Morton Salt Co. v Suppiger Co. that the use of the patent monopoly to restrain competition in the marketing of the unpatented goods for use with the patented one constituted a patent misuse and was contrary to public policy.[179] Following this turn, the US antitrust authorities have been

167 Paul M Romer, 'When Should We Use Intellectual Property Rights?' (2002) 92 American Economic Review 213–216.

168 Nordhaus (n 27).

169 William Landes and Richard Posner, The Economic Structure of Intellectual Property Law (Harvard University Press 2003) 415; Bouckaert (n 143) 805 (noting that IP rights 'are exogenous to the inner logic of private law' and 'the only difference (with government regulation) is that the users of the ideas compensate producers directly without the intermediation of the government').

170 Hovenkamp The Antitrust Enterprise – Principle and Execution (n 139) 250–251 (giving examples of interest-group capture of IP protection).

171 See, Michael Carrier 'Resolving the Patent-Antitrust Paradox Through Tripartite Innovation' (2003) 56 Vanderbilt Law Review 1047.

172 Vladimir Bastidas Venegas, 'Shifting Towards a Dynamic Efficiency Test?: Evaluating Licensing Agreements under Antitrust Law' in Steven Anderman and Ariel Ezrachi (eds) Intellectual property and Competition Law – New Frontiers (Oxford University Press 2011) 461–485.

173 Ibid 466.

174 Bement v National Harrow Co., 186 US 70 (1902) cited by V. Bastidas Venegas (n 172) 466.

175 Ibid 70.

176 Henry v AB Dick Company, 224 US 1 (1912).

177 Clayton Act, Section 3.

178 Motion Picture Patents Company v Universal Film Manufacturing Company et al., 243 US 502 (1917).

179 Morton Salt Co. v Suppiger Co., 314 US 488 (1942).

relatively hostile to IP rights, culminating with the formulation of the so called "Nine No-Nos", a set of practices involving IP rights which were to be found to infringe antitrust law.[180]

In US v General Electric, the Supreme Court suggested a different standard for the interaction between competition law and IP rights.[181] The case concerned a restriction on the price of patented goods imposed by the patent holder to the licensee. The Court focused for the first time on the extent of the reward received by the patent holder and held that "the patentee may grant a license to make, use and vend articles under the specification of his patent for any royalty or upon any condition the performance of which is reasonably within the reward which the patentee by the grant of the patent is entitled to secure".[182] According to the Court, "one of the valuable elements of the exclusive right of a patentee is to acquire profit by the price at which the article is sold […] (t)he higher the price, the greater the profit, unless it is prohibitory."[183] Although this case law favors the interests of the patent holder as opposed to that of licensees, when the patent holder grants a license to make and vend the patented article, the use of the term "reasonable" opens the door to some form of control of the restrictions on price or methods of sale imposed by the patent holder. Commentators have suggested different standards to account for the reasonableness of the restriction.[184]

Baxter proposed a "comparability test" according to which "a patentee is entitled to extract monopoly income by restricting utilization of his invention" as long as the restriction is confined "as narrowly and specifically as the technology of his situation and the practicalities of administration permit."[185] Baxter's assumption is that the bargaining between the patent holder and the licensee sets the reward for each patented invention and provides information on the value of the patent for society. Any restriction confined to the exploitation of the patented invention and not extending to unpatented items will thus be immune from the antitrust laws. However, antitrust law should capture restrictions that potentially may harm the bargaining process, which is understood as being comparable to the value of the invention to licensees and to society. Any restriction affecting the genuineness of the bargaining process, for example a restriction protecting licensees from competition by other licensees, or a restriction allowing the monopolization of the end product in competition with other substitutable technologies, and thus leading to the sharing of the monopolistic profits between licensor and licensee, impacts on the function of the bargaining process as a mechanism for determining the reward to the patent holder and thus falls within the scope of antitrust intervention as going beyond the value of the patent.

Taking a Chicago school of antitrust economics perspective, Bowman advanced a "competitive superiority" test, which would allow a patentee to utilize a restrictive practice if the reward to the patentee represents "the patented product's competitive superiority over substitutes".[186] Bowman distinguishes between profit maximization (which may include the monopolistic price) and the extension of the legal patent monopoly to unpatented products. Only when the latter is established, the practice will fall under the scope of the antitrust laws. Hence, according to this standard, antitrust law will not apply to a practice that aims to deal with free-riding concerns, price discrimination or quality control, to the extent that these will not extend the monopoly rent to unpatented products.

In Europe, the development of standards for the interaction between competition law and IP rights is further complicated by the division of competence between the EU and its Member States with regard to IP law and competition law: Competition law is mainly an EU competence, if inter-state trade is affected, while the creation of systems of intellectual property remains the competence of the Member States. Starting with Consten & Grundig on the granting of a trade mark,[187] the EU courts have asserted on numerous occasions that the "existence" of IP rights granted under national law is not affected by the European treaties, while the "exercise" of the IP rights may fall within the scope of EU competition law. This distinction is based first, on the drafting of the Treaty which, in the context of the free movement of goods provisions of the Treaty, grants to Member States the possibility to justify quantitative restrictions to trade for the protection of intellectual property rights (Article 36 TFEU), second, on the fact that Article 345 TFEU provides that Member States' systems of property law should be protected. The distinction between "existence" and "exercise" may be subject to criticism as it is difficult to distinguish between the core of the IP right, its scope, and its exercise, unless the distinction reflects a decision over a list of legitimate activities that can fall within the scope of the IP right, similar to the approach followed in the US with regard to the scope of the IP rights. For example, would the sale of the IP right fall within the scope of EU competition law or would it be part of the existence of the right, assuming that this covers as any property right the use and sale of the right?

The European Courts have proceeded to a formalistic approach by defining the scope of the IP rights as linked to the "subject matter" and the "essential function" of the specific IP rights. The concept of the "specific subject-matter"

180 Bruce B Wilson, 'Patent and Know-How License Agreements: Field of Use, Territorial, Price and Quantity Restrictions' Address Before the Fourth New England Antitrust Conference (6 November 1970). The list was developed by Bruce Wilson, a former deputy assistant attorney general for antitrust in the 1970s and included mandatory package licensing (patent pools), tying of unpatented supplies, mandatory grant-back clauses, compulsory payment of royalties in amounts not reasonably related to sales of the patented product, tie-outs, post-sale price restrictions on resale by purchasers of patented products.

181 US v General Electric, 272 US 476 (1926).

182 Ibid 489 (emphasis added).

183 Ibid 490.

184 For more analysis, see Carrier (n 171); Bastidas Benegas (n 172).

185 William F Baxter, 'Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis' (1966) Yale Law Journal 267. For a critical analysis, see Michael A Carrier, 'Unravelling the Patent-Antitrust Paradox' (2002) 150 (3) University of Pennsylvania Law Review 761, 795–796.

186 Ward S Bowman, Patent and Antitrust Law: A Legal and Economic Appraisal (University of Chicago Press 1973).

187 Joined cases C-56/64 and 58/64 Consten and Grundig v Commission [1966] ECR 299.

made it possible to determine what might be covered by the legal status of any industrial or intellectual property right without damaging the EU principles of competition or that of free movement. For instance, in the field of patents, the 'specific subject-matter' consists, in the Court of Justice's view, in "the exclusive right to use an invention with a view to manufacturing industrial products and putting them into circulation for the first time […] as well as the right to oppose infringements".[188] The Court also found that "the basic function of the trade mark [is] to guarantee to consumers that the product has the same origin",[189] a definition later expanded to cover the ability of trademark owners to oppose "any possibility of confusion to distinguish that product from products which have another origin".[190] The Court referred to the purposive concept of "essential function" in order to expand the specific subject matter beyond the core rights previously identified. For example, in American Home products, the Court referred to the "essential function" of trademarks to grant to a trademark owner the right to prohibit a reseller of its goods from repackaging the products and then applying the trademark to the new package.[191]

In Windsurfing, the Court found incompatible with Article 101 (1) TFEU a patent licensing agreement containing obligations placed on the licensees only to use components approved by the licensor and to sell the patented product in conjunction with a product outside the scope of the patent clauses.[192] Windsurfing argued that the purpose of the requirement was solely to ensure that the products sold by the licensees were not of inferior quality and did not infringe the rights of other licensees, hence, they were covered by the specific subject-matter of the licensed patent rights. The Court found that such quality controls do not come within the specific subject-matter of the patent unless they relate to a product covered by the patent since their sole justification is that they ensure "that the technical instructions as described in the patent and used by the licensee may be carried into effect".[193] The Court found the "arbitrarily placed" obligation on the licensee only to sell the patented product in conjunction with a product "outside the scope of the patent" as not being "indispensable to the exploitation of the patent".[194]

The distinction between "existence" and "exercise" has also affected the enforcement of Article 102 TFEU to IP rights. In CICCRA/Renault and Volvo/Veng, concerning the refusal by the automobile manufacturers to deliver to independent repairers the spare parts they were producing, the Court emphasised that "the right of the proprietor of a protected design to prevent third parties from manufacturing and selling or importing, without its consent, products incorporating the design constitutes the very subject-matter of his exclusive right", finding that "an obligation imposed upon the proprietor of a protected design to grant to third parties in return for a reasonable royalty, a licence for the supply of products incorporating the design would lead to the proprietor thereof being deprived of the substance of his exclusive right, and that a refusal to grant such a licence cannot in itself constitute an abuse of a dominant position".[195] The Court noted, however, that the "exercise" of an exclusive right could be subject to Article 102 TFEU in "exceptional circumstances" if there was "certain abusive conduct" and provided three examples of situations where Article 102 TFEU could be applicable: in this case (i) the excessive pricing of the patented products, (ii) the refusal to supply independent repair shops and (iii) failure to continue production of parts for car models still in circulation.[196] The concepts of "subject matter" and "essential function" of IP rights have been used in these cases as a shield to competition law enforcement. However, by opening the door for "certain abusive conduct" to fall under Article 102 TFEU the Court sapped the practical relevance of the "existence" / "exercise" distinction.

In Magill, a case involving the refusal by TV stations grant a copyright license for the relevant information on their day programmes, thus impeding Magill from launching a weekly TV guide, the General Court went as far as concluding that the broadcaster conduct was outside the essential function of the copyright when, "in the light of the details of each individual case, it is apparent that that right is exercised in such ways and circumstances as in fact to pursue an aim manifestly contrary to the objectives of Article [102 TFEU]."[197] According to the Court, "(i)n that event, the copyright is no longer exercised in a manner which corresponds to its essential function […] which is to protect the moral rights in the work and ensure a reward for the creative effort, while respecting the aims of, in particular, Article [102 TFEU]. Indeed, "(i)n that case, the primacy of [EU] law, particularly as regards principles as fundamental as those of the free movement of goods and freedom of competition, prevails over any use of a rule of national intellectual property law in a manner contrary to those principles."[198] Although in its judgment on appeal the Court of Justice has not discussed this part of the General Court's judgment and did not deal with the issue of the "subject matter" of the copyright in question, Advocate General Gulmann noted in his Opinion that "the right to refuse licences forms part of the specific subject-matter of copyright" and criticized the General Court's conclusion for incorporating "the aim of the competition rules in the determination of the essential function of copyright" and thus for not accepting the competition law immunity of conduct falling within the scope of the "essential function" of the

188 Case 15/74 Centrafarm BV and Adriaan de Peijper v Sterling Drug Inc [1974] ECR 1147.

189 Case 119/75 Terrapin (Overseas) Ltd. v Terranova Industrie CA Kapferer & Co [1976] ERR 1039.

190 Case 102/77 Hoffmann-La Roche & Co. AG v Centrafarm [1978] ECR 1139.

191 Case C 3/78 Centrafarm v American Home products corporation [1978] ECR 1823.

192 Case 193/83 Windsurfing International v Commission [1986] ECR 611.

193 Ibid para 45.

194 Ibid para 57.

195 Case 53/87 CICCRA v Renault [1988] ECR 6039; Case 238/87 Volvo v Veng [1988] ECR 6211, para 8.

196 Ibid para 9.

197 Case T-69/89 RTE v Commission [1991] ECR II-485; Case T-70/89, British Broadcasting Corporation and BBC Enterprises Ltd v. Commission [1991] ECR II-535, para 58 (British Broadcasting case); Case T-76/89, ITP v Commission [1991] ECR II-575.

198 Ibid British Broadcasting Case, para 58.

copyright.[199] The Court of Justice preferred instead to refer to the "exceptional circumstances" that conduct involving IP rights might fall under article 102 TFEU.[200] The concept of "exceptional circumstances" has been interpreted broadly by the jurisprudence of the European Courts,[201] as well as national courts,[202] thus suggesting that the EU courts have abandoned their previous formalistic approach focusing on the definition of the scope of the IP right and its core for a more open-ended approach that would involve some form of case by case (economic) analysis.

It is noteworthy that in other occasions the EU Courts went beyond a purely formalistic distinction between the "existence", the core of the IP right, and its "exercise" and considered the value of the IP right in envisioning the interaction between competition law and IP rights. In Erawu-Jacquery v La Hesbignonne, the Court held that a prohibition on the sale or export of basic seeds was not within Article 101 TFEU since considerable investment had been made in developing the basic seed.[203] According to the Court, "a person who has made considerable efforts to develop varieties of basic seed which may be the subject-matter of plant breeders' rights must be allowed to protect himself against any improper handling of those varieties of seed" and "to that end, the breeder must be entitled to restrict propagation to the growers which he has selected as licensees."[204]

(ii) Standards focusing on the intent of the IP holder

A possible alternative standard is to focus on the intent of the monopolist.[205] Some US courts have adopted standards based on intent advancing the view that a monopolist should not "rely upon a pretextual business justification to mask anticompetitive conduct."[206] This might involve some analysis of the subjective intent of the undertaking, by looking to documents, emails or statements. However, it is unclear at what level of management the decision-maker should look to find evidence of intent and it is quite common for executives to use language that suggests intent to exclude a competitor.

An alternative would be to examine objective intent as this is indicated by the behaviour of the undertaking. In its Preliminary Report of the Sector Inquiry on the Pharmaceutical Sector, the Commission noted that "intention can […] be taken into account in competition law assessments,"[207] although it is clear that the intent of the applicants does not form part of the assessment of patent claims.[208] The Astra Zeneca decision of the European Commission, confirmed by the General Court, acknowledged the importance of evidence of anti-competitive intent in demonstrating that a conduct is liable to have anticompetitive effects.[209] The General Court found that while abuse is an objective concept, "[…] intention can still be taken into account to support the conclusion that the undertaking concerned abused a dominant position, even if the abusive conduct actually took place."[210] In any case, evidence of intent plays a limited role in Article 102 analysis.[211]

b. Economic balancing tests

Balancing tests weigh the restriction of allocative efficiency or other anticompetitive effects of the conduct involving IP rights from one side and the possible benefits of these IP rights in inducing innovation and dynamic efficiency on the other side. Innovation is considered positively as it enhances competition in the market and provides a variety of choice to consumers. Contrary to the formalistic analysis conducted under the scope or intent tests, balancing tests involve some consideration of the economic effects of the IP rights in the specific market configuration.

One of the most sophisticated balancing tests is Kaplow's ratio test, which examines the ratio between "the reward the patentee receives when permitted to use a particular restrictive practice" and "the monopoly loss that results from such exploitation of the patent."[212] According to Kaplow, 'patentee reward' and 'monopoly loss' refer, respectively, to the incremental reward and loss resulting from the practice in

199 Opinion of AG Gulman in Joined cases C-241/91 P and C-242/91 P, Radio Telefis Eireann (RTE) and Independent Television Publications Ltd (ITP) v Commission [1995] ECR I-743, para 38 & 70.

200 Joined cases C-241/91 P and C-242/91 P, Radio Telefis Eireann (RTE) and Independent Television Publications Ltd (ITP) v. Commission [1995] ECR I-743.

201 See, for instance Joined cases C-241/91 P and C-242/91 P, (n 194), paras 10 & 50; Case C-418/01 IMS Health GmbH & Co OHG v. NDC Health GmbH & Co KG [2004] ECR I-5039, para 35, 37 (listing as constituting exception circumstances the refusal to grant license of an input the supply of which was indispensable for carrying on the business in question, the fact that such refusal prevented the emergence of a new product for which there was a potential consumer demand, the fact that it was not justified by objective considerations and was likely to exclude all competition in the secondary market); Microsoft CFI case (n 120), para 331 and 647 (noting that prejudice may arise where there is a limitation not only of production or markets, but also of technical development, thus extending the scope of application of Article 102 TFEU to refusals to license) (IMS Health case).

202 See, for instance in the UK, Intel Corp. v Via Technologies Inc. [2002] EWCA Civ 1905 (Civil Division – Court of Appeal), para 48 (noting that exceptional circumstances may extend beyond those contemplated in Magill and IMS).

203 Case 27/87 SPRL Louis Erauw-Jacquery v La Hesbignonne SC [1988] ECR 1919. See also, Case 258/78, Nungesser v. Commission [1982] ECR 2015.

204 Ibid para 10.

205 Carrier (n 171) 793.

206 Image Technical Services, Inc. v Eastman Kodak Co. 125 F.3d 1195 (9th Cir. 1997), 1219.

207 European Commission, Pharmaceutical Sector Inquiry, Final Report (n 43), footnotes 375 and 376.

208 For example, in the context of the DG Comp's Pharmaceutical sector inquiry, the European Patent Office argued against a scrutiny of the intent of applicants in applying for patent rights for purposes of competition law. See, Communication from the Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report, available at < http://ec.europa.eu/competition/sectors/pharmaceuticals/inquiry/communication_en.pdf >, last accessed 28 April 2013, p. 7

209 Commission Decision, AstraZeneca (n 20) Annex A, para. 13.

210 Case T-321/05 AstraZeneca AB v Commission [2010] ECR II-2805, para 334, although on appeal the Court of Justice did not explicitly confirmed this position: Case C-457/10P AstraZeneca AB v. Commission (6 December, 2012).

211 See, for instance, Case C-549/10 Tomra Systems ASA v Commission (April 12, 2012), para 19 (noting that "it is clearly legitimate for the Commission to refer to subjective factors, namely the motives underlying the business strategy in question"), paras 21 and 22 (observing that "the Commission is under no obligation to establish the existence of such intent on the part of the dominant undertaking in order to render Article [102 TFEU] applicable" and that "(t) he existence of an intention to compete on the merits, even if it were established, could not prove the absence of abuse").

212 Louis Kaplow, 'The Patent-Antitrust Intersection: A Reappraisal' (1984) 97 Harvard Law Review 1813, 1816.

question."[213] The ratio depends on how much the reward is increased or decreased as opposed to how much the monopoly deadweight loss is increased or decreased by each individual licensing restriction. This ratio will be compared to an "optimal ratio", which is the ratio for increasing the patent life by one year, assuming that patent law has made the right balance of incentives and rewards at the first place.[214] If the individual ratio for the specific practice is lower than the optimal ratio, the practice should be prohibited. If it is higher, then one should measure whether the licensing practice costs less (in providing the incremental reward) than the last year of patent life. If the individual ratio is higher, the practice is permitted. Contrary to other standards, the test provides a balancing on a case-by-case basis of the possible effects of the exercise of the IP rights on allocative and dynamic efficiency. However, the test is resource intensive, as it requires ascribing particular numbers for patentee reward and monopoly loss, a difficult task already for economists not to mention the courts.[215] It also focuses on total welfare and does not grant a specific weigh to the welfare of consumers, unless we assume that the interest of the consumers long term coincide with that of the inventor, which might be problematic in jurisdictions in which the protection of the consumers is the primary objective of competition law. One might also object to the narrow view of the concept of innovation in this test as it emphasizes the reward for the pioneer inventor (standalone innovation), without considering the possibility of cumulative innovation.[216] The implicit assumption that the patent system has made the right balance of incentives and rewards, in order to define the optimal ratio, may also be questioned.

Among the various economic balancing tests that have also been suggested, Ordover argues that the critical trade-off is "between incentives for investment in knowledge creation and the overall efficiency with which this investment is achieved."[217] For Ordover, both competition law and intellectual property law contribute to the two stages of competition that are "pertinent to the understanding of dynamic evolution of the economy": "(e)x ante competition occurs at the R&D stage (production of knowledge); (e)x post competition occurs at the product (or service) stage."[218] The presentation of the tension between these two areas as indicating a tension between monopoly and competition is thus incorrect:

"First of all, inasmuch as patent, copyright and trademark laws and antitrust law are all concerned with promoting efficient allocation of social resources, there can be no conflict on this account. In particular, both patent and antitrust law recognize that without clearly specified property rights the economic system is bound to collapse. And, second of all, antitrust law itself recognizes monopoly (market power) as a reward for innovative effort."[219]

Hence, the conflict arises when the dynamic goals of the patent law clash with the static allocative goals of competition law, hence the conclusion that "the conflict between these two bodies of law reflects the trade-off between static and dynamic efficiency."[220] The comparison of static allocative efficiency effects and dynamic efficiency raises the issue of the discounting of the dynamic efficiency effects, "because the benefits from a given R&D investment flow over time they must be made commensurate with the up-front costs of the investment itself."[221] Ordover conceptualizes the existence of two markets: the upstream market (of ideas, information and knowledge) and the downstream market (of products and services) arguing that these two markets are connected temporally but also intertemporally linked "in the sense that economic events (such as the intensity of competition) that occur in the upstream market have a prospective impact on competition and on allocative efficiency in the downstream market."[222] He suggests the analysis of the effects of these practices and institutions in the form of a structured rule of reason that would look to market shares, market concentration and entry barriers at both levels of this "temporal vertical chain". The analysis is more complicated than for other vertical agreements in the licensing context as the firm that sells the license participates both in the upstream (R&D) market as well as in the downstream (product or services) market, which suggests that the anticompetitive effect is more likely in the licensing context if the restriction is employed by a firm that operates in both markets. A practice is deemed efficient "if it leads to a lower cost of 'producing' the same 'quantity' of knowledge, new information or ideas."[223] Should it be necessary to weigh the pro-competitive effects in one market to the anti-competitive effects in the other, Ordover suggests giving a greater weight to expansions of the R&D output than to expansions (or contractions) of outputs of goods and services. In essence, his approach advances the following components in the structured rule of reason analysis: "(i) (t)he finegrain structure of both the downstream and upstream markets, (ii) (t)he actual legal interpretations of the patent, copyright and trade-mark laws: for example, are patents interpreted broadly or narrowly? (iii) (t)he strength of incentives for the creation of intellectual and industrial property provided by other tools of social policy that have an impact on knowledge and information creation, (iv) (t)he nature of the R&D activity itself. For example, are R&D expenditures being devoted to a 'patent race' towards a major breakthrough where there can be (temporarily) only one winner, or are these expenditures being devoted to minor process or product improvements that allow a number of winners to coexist as rivals in the marketplace."[224]

213 bid 1831–1832.

214 Ibid 1830.

215 Carrier (n 172) 798. As it has been noted by Janusz A Ordover, 'Economic Foundations and Considerations in Protecting Industrial and Intellectual Property' (1984) 53 (3) Antitrust Law Journal 503, 514 (noting that "it is unlikely that the analyst will have information that is precise enough to determine the movement of the ratio, especially in those close cases when, as a result of relaxation, both numerator and denominator of the ratio move in the same direction, as when a new practice increases both the innovator's reward and the monopoly loss").

216 Bastidas Venegas (n 172) 473.

217 Ordover (n 215) 509.

218 Ibid 510.

219 Ibid 511.

220 Ibid

221 Ibid 514.

222 Ibid

223 Ibid 517.

224 Ibid 518.

Other economic balancing tests focus on the IP side of the equation and suggest an adjustment of the scope and strength of IP rights as a possible solution to the problem.[225]

Although not explicitly referring to a balancing test, the US DOJ and FTC Intellectual Property Guidelines in 1995 took a more positive view of IP rights and ended the period of hostility represented by the "Nine No Nos" approach previously followed by the US agencies, following a period during the 1980s during which the IP rights have been strengthened. The Guidelines advance that restraints in intellectual property licensing arrangements are evaluated under the rule of reason, the Agencies inquiring "whether the restraint is likely to have anticompetitive effects and, if so, whether the restraint is reasonably necessary to achieve procompetitive benefits that outweigh those anticompetitive effects,"[226] by looking to the characteristics of the restraint (was it imposed by a competitor or a non-competitor, does it involve an exclusive license?) and a number of market factors (concentration, market shares, possible foreclosure or collusive effects). According to the Guidelines,

"(i)f the Agencies conclude that the restraint has, or is likely to have, an anticompetitive effect, they will consider whether the restraint is reasonably necessary to achieve procompetitive efficiencies. If the restraint is reasonably necessary, the Agencies will balance the procompetitive efficiencies and the anticompetitive effects to determine the probable net effect on competition in each relevant market".

The Guidelines also put in place a "safety zone" recognizing that licensing arrangements often promote innovation and enhance competition and thus some degree of certainty should be offered to undertakings in order to encourage such activity. The safety zone encapsulates a balancing test, as it implies that such arrangements have positive effects on welfare. With regard to the effect on product markets, the licensor and its licensees collectively should account for no more than twenty percent of each relevant market significantly affected by the restraint. With regard to the effect on technology and innovation markets, there should be at least four or more independently controlled technologies in addition to the technologies controlled by the parties to the licensing arrangement. Alternatively, there should be four or more independently controlled entities in addition to the parties to the licensing arrangement possessing the required specialized assets or characteristics and the incentive to engage in research and development that is a close substitute of the research and development activities of the parties to the licensing agreement.[227] There is no presumption that arrangements falling outside the "safety zone" are anticompetitive.

The EU Guidelines on Transfer of Technology Agreements seem to be inspired by the same principle.[228] Their starting standpoint is that there is no inherent conflict between intellectual property rights and EU competition rules. According to the Commission,

"[…] both bodies of law share the same basic objective of promoting consumer welfare and an efficient allocation of resources. Innovation constitutes an essential and dynamic component of an open and competitive market economy. Intellectual property rights promote dynamic competition by encouraging undertakings to invest in developing new or improved products and processes. So does competition by putting pressure on undertakings to innovate. Therefore, both intellectual property rights and competition are necessary to promote innovation and ensure a competitive exploitation thereof."[229]

The Guidelines refer to the concept of "dynamic competition",[230] which we will explore later in the report, but it is important here to note that although there is no presumption that intellectual property rights and licence agreements as such give rise to competition concerns, any eventual anticompetitive concerns will be assessed with an eye on the possible pro-competitive efficiencies, which must be "balanced against the negative effects on competition."[231] The EU Guidelines also create a safe harbour for licensing arrangements that do not impose any hardcore restriction, such as a cartel, a resale price maintenance clause, restrictions on the exploitation and development of the licencee's own technology.[232] In the current version of the EU Regulation, the market share threshold to be applied for the purpose of the safe harbour depends on whether the agreement is concluded between competitors or non-competitors. In the case of agreements between competitors, which do not include a hardcore restriction, the market share threshold is 20% and in the case of agreements between non-competitors it is 30%, as in the latter case the activities of the parties are usually complementary to each other. Outside the safe harbour created by the market share thresholds individual assessment is required. The fact that market shares exceed the thresholds does not give rise to any presumption that the agreement is caught by Article 101 TFEU. In order to promote predictability beyond the application of these thresholds and to confine detailed analysis to cases that are likely to present real competition concerns, the Commission adds a second safe harbor, again with the exception of hardcore restrictions, when there are four or more independently controlled technologies in addition to the technologies controlled by the parties to the agreement that may be substitutable for the licensed technology at a comparable cost to the user.[233] According to the Guidelines, in assessing whether the tech-

225 E.g. Kaplow 'The Patent-Antitrust Intersection: A Reappraisal' (n 212).

226 US DOJ & FTC, Antitrust Guidelines for the Licensing of Intellectual Property (April 6, 1995), Section 3.1, available at < http://www.justice.gov/atr/public/guidelines/0558.htm#t21> accessed 28 April 2013.

227 Ibid Section 4.3.

228 Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements (n 106).

229 Ibid para 7.

230 Ibid para 8.

231 Ibid para 9.

232 Article 4, Transfer of Technology Block Exemption Regulation 772/2004, [2004] OJ L23.

233 Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements (n 106) para. 131.

nologies are sufficiently substitutable, the relative commercial strength of the technologies in question must be taken into account.

In the context of Article 102 TFEU, the European Commission seems to have been inspired by the balancing approach in its Microsoft decision.[234] The specific characteristics of intellectual property rights were not prima facie taken into account. The Commission observed that "there is no persuasiveness to an approach that would advocate the existence of an exhaustive checklist of exceptional circumstances and would have the Commission disregard a limine other circumstances of exceptional character that may deserve to be taken into account when assessing a refusal to supply."[235] Microsoft has put forward the same justification as in the US litigation: the need to protect its own incentives to innovate by preserving its intellectual property rights.[236] The Commission rejected that claim by affirming that intellectual property rights "cannot as such constitute a self-evident objective justification for Microsoft's refusal to supply."[237] It followed in that respect the position of the Federal Circuit in the US Microsoft case.[238]

The Commission considered that innovation is an objective for both intellectual property and competition law[239] and adopted a balancing test focused on innovation incentives concluding that

"[…] a detailed examination of the scope of the disclosure at stake leads to the conclusion that, on balance, the possible negative impact of an order to supply on Microsoft's incentives to innovate is outweighed by its positive impact on the level of innovation of the whole industry (including Microsoft). As such the need to protect Microsoft's incentives to innovate cannot constitute an objective justification that would offset the exceptional circumstances identified."[240]

On examination, the test seems broader than the "new product" rule. First, the Commission takes into account the incentives of the competitors of the dominant firm to innovate in the future. This was not an issue considered in Magill and IMS/NDC Health where the question was about products which, absent the refusal to supply, have been sold or were to be offered in the market. Second, the Commission included in its analysis the incentives of Microsoft to innovate. In Magill and NDCHealth the Court only referred to the dominant firm's competitors, which had the intention to enter the secondary market in order to offer a new product and were excluded by the dominant firm. However, in Microsoft, the Commission took also into account Microsoft's incentives to innovate in comparing the situation where article 102 applies with the alternative situation where Microsoft's anti-competitive behaviour remains unfettered.[241] According to the Commission,

"Microsoft's research and development efforts are […] spurred by the innovative steps its competitors take in the work group server operating system market. Were such competitors to disappear, this would diminish Microsoft's incentives to innovate."[242]

Because of the nature of the market, Microsoft's incentives to innovate were maintained, while those of its competitors were also preserved.

The analysis of the incentives of a dominant firm or of its rivals in the secondary market to innovate extends the scope of article 102 TFEU in comparison with the new product rule. This is based on the assumption that competitive pressure increases the dominant firm's incentives to innovate. This is also linked to the belief that a competitive market is the optimal structure for innovation.

The Commission's DG Comp Staff Discussion paper on Article 102 TFEU, adopted in 2005, suggested the adoption of two tests: the "new product rule" and the "incentives to innovate" test.[243] First, in order to constitute an infringement, the refusal to grant a licence should prevent: "the development of the market for which the licence is an indispensable input, to the detriment of consumers. This may only be the case if the undertaking which requests the licence does not intend to limit itself essentially to duplicating the goods or services already offered on this market by the owner of the IPR, but intends to produce new goods or services not offered by the owner of the right and for which there is a potential consumer demand."[244] Second, "a refusal to licence an IPR protected technology which is indispensable as a basis for follow-up innovation by competitors may be abusive even if the licence is not sought to directly incorporate the technology in clearly identifiable new goods and services. The refusal of licensing an IPR protected technology should not impair consumers' ability to benefit from innovation brought about by the dominant undertaking's competitors."[245]

The implementation of this test in practice would, however, raise important difficulties. The courts are not generally well equipped to conduct the type of prospective cost-benefit analysis that would be necessary in order to balance the incentives of the dominant firm and its rivals to innovate. In that respect, Microsoft was a relatively easy case. The Commission did not undertake the difficult task to balance incentives to innovate, as it assumed that the incentives of Microsoft

234 Commission Decision, Microsoft/W2000 (COMP/C-3/37.792), 24 March 2004, available from <http://www.europa.eu.int/comm/competition/antitrust/cases/decisions/37792/en.pdf> accessed 28 April 2013 (Microsoft Commission Decision).

235 Ibid para 555.

236 Ibid para 709.

237 Ibid para 710.

238 U.S. v Microsoft Corp., 253 F.3d 34, 63 (Microsoft's argument that the exercise of an intellectual property right cannot give rise to antitrust liability "borders on the frivolous") (US Microsoft Case).

239 Microsoft Commission Decision (n 228) para 712.

240 Ibid para 783.

241 Ibid para 725.

242 Ibid para 725.

243 DG Competition discussion paper on the application of Article 82 of the Treaty to exclusionary abuses (hereinafter referred as DG Staff Discussion Paper) December 2005, available at <http://www.europa.eu.int/comm/competition/antitrust/others/discpaper2005.pdf> accessed 28 April 2013, paras 237–242.

244 Ibid para 239.

245 Ibid para 240.

were not hampered by the prohibition of the refusal to supply interoperability. However, if the dominant firm's incentives to innovate were affected by the prohibition of the refusal to licence, it would have been necessary to conduct a proper cost-benefit analysis, which may prove a difficult task for the judiciary.

In its Microsoft judgment, the General Court rephrased the condition of the "new product rule" by considering that prejudice to consumers may arise where there is limitation of technical development.[246] The Court did not however balance Microsoft's incentives to innovate with those of its competitors, thus focusing on a version of the balancing test that would compare static allocative inefficiencies to dynamic efficiency benefits. This version of the test may lead to an extension of the scope of Article 102 TFEU, as it takes into account only the incentives of the rivals of the dominant firm to innovate without considering those of the dominant firm.

The Commission followed up with its Guidance on its enforcement priorities with regard to exclusionary abusive practices by integrating the "new product rule" to the consideration of consumer harm in the context of Article 102 TFEU in the form of dynamic effects, advancing that "consumer harm may, for instance, arise where the competitors that the dominant undertaking forecloses are, as a result of the refusal, prevented from bringing innovative goods or services to market and/or where follow-on innovation is likely to be stifled."[247] The Commission seems however to subject dynamic efficiency gains to a more demanding analysis, than anticompetitive dynamic effects: as for all types of objective justifications, "the dominant undertaking will generally be expected to demonstrate, with a sufficient degree of probability, and on the basis of verifiable evidence, that the following cumulative conditions are fulfilled: (i) the efficiencies have been, or are likely to be, realised as a result of the conduct […] (ii) the conduct is indispensable to the realisation of those efficiencies: there must be no less anti-competitive alternatives to the conduct that are capable of producing the same efficiencies […], (iii) the likely efficiencies brought about by the conduct outweigh any likely negative effects on competition and consumer welfare in the affected markets […] (iv) the conduct does not eliminate effective competition, by removing all or most existing sources of actual or potential competition."[248] The Commission further notes that "rivalry between undertakings is an essential driver of economic efficiency, including dynamic efficiencies in the form of innovation," thus requiring a residual degree of competition to be maintained in all cases.[249] The current approach does not take into account efficiencies with low probability of being realized or passed on to consumers.

A similar approach is followed in the context of article 101 (3) TFEU.[250]

The risk of the economic balancing approach is that in practice courts and competition authorities may emphasize more restrictions to allocative efficiency than dynamic efficiency benefits. The possibility that these economic balancing tests might lead in practice to weigh more static efficiency as opposed to dynamic effects has led to the view that competition law should turn to dynamic analysis and embrace the goal of innovation.

c. Competition law and the turn to dynamic analysis

(i) "Dynamic competition" as a criterion of competition law analysis

The competition/static allocative efficiency bias of the economic balancing test has led many authors to suggest a reorientation of competition law towards a more dynamic approach that would incorporate innovation as an objective of competition law.[251] The concept of "dynamic competition" regroups a number of theories that might be distinguished from the "static competition model".[252] Jerry Ellig and Daniel Lin outlined the principal strands of dynamic competition law scholarship: (i) Schumpeterian competition does not focus on price and output but on new products, new technologies, new sources of supply, new forms of organization. Possession of market power is found consistent with vigorous competition; (ii) Evolutionary competition acknowledges that firms develop different routines for doing things and that the bundle of routines that best enables undertakings to grow and prosper is selected by the competitive process,

246 Microsoft CFI case (n 118), para 647.

247 Communication from the Commission – Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings, [2009] OJ C 45/7, para. 87 (Guidance Paper).

248 Ibid para 30.

249 Ibid

250 European Commission, Notice – Guidelines on the application of article 81 (3) [2004] (n 107), para. 51, noting that "(a) ll efficiency claims must […] be substantiated so that the following can be verified: (i) the nature of the claimed efficiencies, (ii) the link between the agreement and the efficiencies, (iii) the likelihood and magnitude of each claimed efficiency and (iv) how and when each claimed efficiency would be achieved." According to the Commission, the parties should describe and explain in detail what is the nature of the efficiencies and how and why they constitute an objective economic benefit and substantiate any projections as to the date from which the efficiencies will become operational so as to have a significant positive impact in the market. Unsubstantiated efficiency claims are rejected. These requirements also apply in the context of Article 102 TFEU.

251 See, Michael A. Carrier, *Innovation for the 21st Century: Harnessing the Power of Intellectual Property and Antitrust Law* (Oxford University Press 2011).

252 See, for this opposition, Tepperman and Sanderson (n 93) 5, "Competition based on the successive introduction of new or better products over time is called dynamic competition. Dynamic competition based on investment in R&D may be thought of as a form of "competition for the market" in contrast to price competition which is "competition in the market." This characterization is overly simplistic, however. There are certainly many situations in which both forms of competition operate – firms may compete for customers' business by reducing price and improving quality for existing goods, and by pursuing innovation in an effort to introduce new goods to market. Nonetheless, this way of dichotomizing competitive rivalry serves to emphasize an important contrast. Static views of competition take the existing set of products and market participants as given, describing the outcome of competitive behaviour among those market participants using strategic instruments such as pricing or advertising that can be applied and varied in the "short term". Dynamic competition involves the creation of new products and potentially also new markets, along with the replacement or obsolescence of older products. It also implicitly or explicitly involves entry and exit by firms – there is no guarantee that today's successful firms will be able to offer the product attributes demanded by tomorrow's consumers".

which should be left to operate freely (without intervention); (iii) from an Austrian perspective, information about production methods and consumers' desires is incomplete. Hence, competition is a process by which firms discover new resources and better ways to satisfy consumers; (iv) a path dependence approach would focus on increasing returns and network effects, acknowledging the fact that consumers may be locked in to inferior technologically options and that competition often takes the form of "winner takes it all"; Finally, (v) a resource based perspective will emphasize capabilities in transforming resources to valuable outputs and thus increase profitability.[253] A common characteristic of these different theories of "dynamic competition" is that they focus on innovation as a key component of the competitive process.

Several authors have explored the implications of such dynamic analysis in competition law. Richard Gilbert and Steven Sunshine have argued for the explicit integration of dynamic efficiency concerns in merger control, through the concept of "innovation markets".[254] David Evans and Richard Schmalensee have noted that "firms engage in dynamic competition for the market, through sequential winner-take-all races to produce drastic innovations, rather than through static price/output competition in the market."[255] They argued for a competition law analysis in "dynamic industries" that would require explicit consideration of "dynamic competition", thus making a distinction between competition law applying to the "new economy" or "high technology" and the "old economy". Christopher Pleatsikas and David Teece have criticized the static analytical frameworks applied in defining markets and measuring market power without due noting that the basis for competition in many high technology industries is fundamentally different from that in more mature and stable industries, as there is a much greater emphasis on performance-based, rather than price-based, competition and hence a more "dynamic analysis" is required.[256] Sidak and Teece have argued for a "neo-Schumpeterian framework for antitrust analysis that favors dynamic competition over static competition [that] would put less weight on market share and concentration in the assessment of market power."[257] The concept of "dynamic competition" has been given different definitions. Some have emphasized the time dimension of the concept arguing that "(d)ynamic competition models entail the prediction of future competitive outcomes."[258] Others, have observed that "dynamic is a shorthand for a variety of rigorously competitive activities such as significant product differentiation and rapid response to change, whether from innovation or simply new market opportunities ensuing from changes in "taste" or other forces of disequilibrium",[259] taking leave from the concept of equilibrium, at least in a non-stochastic form. As it was often repeated, dynamic analysis "views competition through a broader lens and focuses less on outcomes and more on process".[260] This view might require a complete revamp of the way competition law addresses innovation.

Michael Katz and Howard Shelanski observed the multiplier effect that innovation may have on efficiency gains. They suggested the consideration of dynamic efficiencies, even if these are not certain, thus breaking with the conventional hostility of competition law to efficiency gains that are not certain, by advancing an expected value approach that would account both the magnitudes and probabilities of potential, merger-related efficiencies.[261] Competition authorities and courts should use a decision-theoretic approach under conditions of uncertainty, which would select the course of action that yields the highest expected payoff, "where the expected value of taking an action is equal to the payoffs associated with the different possible outcomes that can follow from that action weighted by the probabilities that those outcomes will occur if the action is taken."[262] Such an approach would require the decision-makers to base their judgment on broader evidence about how competition is evolving in the specific industry. Jonathan Baker has also suggested an industry-specific approach in competition law enforcement by arguing that competition law authorities should target enforcement to appropriate industries: "winner-take-all markets" or markets where future product competition remains unaffected by current product market competition, as a result of pending technological change, growing demand or regulatory intervention.[263]

Other authors have challenged the view that competition law analysis is static and does not accommodate dynamic competition concerns. Cal Shapiro criticized the view that innovation and dynamic competition concerns should lead competition law to be extremely cautious of imposing limits on the conduct of dominant firms or prohibiting mergers in dynamic industries, noting that today's market leaders may be able to maintain or extend their dominance while slowing the pace of innovation and arguing that competition doctrine does not actually focus on static analysis.[264] More recently, Gans argued that static analyses are not misleading and can

253 Jerry Ellig and Daniel Lin, 'A Taxonomy of Dynamic Competition Theories' in Jerry Ellig (ed), Dynamic Competition and Public Policy – Technology, Innovation and Antitrust Issues (Cambridge University Press 2011) 16–44.

254 Richard J Gilbert and Steven C Sunshine, 'Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets' (1995) 63 Antitrust Law Journal 569.

255 David S Evans and Richard Schmalensee, 'Some Economic Aspects of Antitrust Analysis in Dynamically Competitive Industries' in Adam B Jaffe, Josh Lerner and Scott Stern (eds), Innovation Policy and the Economy, Vol. 2, (MIT Press 2002). On the distinction between competition for the market and competition in the market, see Paul A Geroski, 'Competition in Markets and Competition for Markets' (2003) 3 Journal of Industry, Competition and Trade 151.

256 Christopher Pleatsikas and David Teece, 'The analysis of market definition and market power in the context of rapid innovation' (2001) 19 International Journal of Industrial Organization 665.

257 Gregory J Sidak and David J Teece, 'Dynamic Competition in Antitrust Law' (2009) 5 (4) Journal of Competition Law & Economics 581.

258 Douglas H Ginsburg and Joshua D Wright, 'Dynamic Analysis and the Limits of Antitrust Institutions' (2012) 78 (1) Antitrust Law Journal 1.

259 David J Teece, 'Favoring Dynamic over Static Competition: Implications for Antitrust Analysis and Policy' in Geoffrey A Manne and Joshua D Wright, Competition Policy and Patent law under Uncertainty (Cambridge University Press 2011) 203, 211.

260 Ibid 217.

261 Howard A Shelanski and Michael L Katz, Mergers and Innovation (2007) 74 Antitrust Law Journal 1.

262 Ibid.

263 Jonathan Baker, 'Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation' (2007) 74 (3) Antitrust Law Journal 575.

264 Carl Shapiro, 'Antitrust, Innovation, and Intellectual Property – Testimony Before the Antitrust Modernization Commission' (8 November 2005).

be a good proxy for dynamic effects, with the exception of cases where the predominant mode of commercialization by innovative entrants is via cooperation rather than competition with incumbent firms, in which case both static and dynamic analyses should be combined.[265]

Joshua Wright has expressed doubts as to the state of current theoretical apparatus and empirical evidence in competition law to conduct the complex trade-offs required by dynamic competition law analysis.[266] Drawing on previous work by Harold Demsetz,[267] Wright highlights the complexity of the task of weighing effects on the several dimensions of competition that might be affected by a specific conduct. In some cases one dimension of competition (e.g. price) is negatively correlated to another (e.g. new products, innovation or quality) and this negative correlation means that a policy selecting the optimal mix of competitive forms requires knowledge of the "technical rates of substitution between these forms in order to covert different forms into common units of consumer welfare".[268] However, as Wright notes, competition law analysis "does not provide an analytically coherent method to equalize measures of intensity, efficiency or consumer welfare".[269] Wright argues against presumptions of anticompetitive effect in this context and an overall guiding principle of deference to the competitive process, in the absence of clear and convincing evidence of substantial consumer harm.[270]

It follows from these divergent points of view that there is some disagreement over the adequate methodologies to be followed for the incorporation of innovation and "dynamic competition" in competition law analysis. Some would favour an adjustment to the existing tools, by paying more attention to possible dynamic anticompetitive effects and taking more into account dynamic efficiency gains, eventually biasing the economic balancing process in favour of dynamic efficiency considerations. Others would encourage a tailored approach to "dynamic competition" by developing new concepts and tools,[271] such as innovation markets and an innovation-centred competition law.[272]

It is important here to note that whichever approach with regard to the integration of "dynamic competition" is followed, this will have few implications for the relation between competition law and IP rights. In other words, this is a different question than the interaction between "static competition" and "dynamic competition" in competition law analysis. First, there should be no assumption that intellectual property rights promote "dynamic competition", as this depends on the nature of innovative activity in the industry (including the degree of cumulative innovation) or the strength of IP protection, among other factors. If that is true the fact that competition law focuses on "static competition" or "dynamic competition" is irrelevant, with regard to the interaction between these two areas of law. Indeed, a static competition law analysis might be the least imperfect option, if it is compared to the choice of protecting IP rights that would not advance "dynamic competition" but would restrict "static competition". Protecting "static competition" is better than not protecting any form of competition. Second, even if one assumes that intellectual property rights promote "dynamic efficiency" or "dynamic competition",[273] a rather blunt assumption with regard to the available evidence so far, it is also unclear how that would affect the interaction between competition law and intellectual property rights. If competition law pursues both "dynamic competition" and "static competition", it would be a far superior instrument than intellectual property law, which would sacrifice "static competition" for "dynamic efficiency", unless one considers that "dynamic efficiency" weighs more than "static efficiency" and that the methods for incorporating dynamic efficiency in intellectual property law are superior than those available in competition law analysis. However, there is no reason to assume that intellectual property law has developed a superior "technology" than competition law for incorporating dynamic efficiency concerns in the analysis. It is only if competition law pursues exclusively "static efficiency" that it would constitute an inferior alternative to intellectual property law, should it be assumed that intellectual property promotes "dynamic efficiency". Hence, by bringing "dynamic competition" and innovation to the centre of competition law, competition law scholars may finish by transforming competition law to a more effective regulatory instrument than intellectual property in promoting innovation.

(ii) Technology and innovation markets in US and EU competition law

The US DOJ and FTC Guidelines for the licensing of IP note that an arrangement can affect price or output in three types of markets: a market for existing goods and services, a technology market consisting of intellectual property that is licensed and its close substitutes, and an innovation market consisting of the research and development directed to particular new or improved goods or processes and the close substitutes for that research and development, "tomorrow's products".[274] Technology and innovation markets serve as

265 Joshua S Gans, 'When Is Static Analysis a Sufficient Proxy for Dynamic Considerations? Reconsidering Antitrust and Innovation' (2011) 11 (1) Innovation Policy and the Economy 55.

266 Joshua D Wright, 'Antitrust, Multidimensional Competition and Innovation – Do we Have an Antitrust-Relevant Theory of Competition Now?' in Geoffrey A Manne and Joshua D Wright (eds), Competition Policy and Patent law under Uncertainty (Cambridge University Press 2011) 228–251.

267 Harold Demsetz, '100 Years of Antitrust: Should we Celebrate?' Brent T. Upson Memorial Lecture, George Mason University School of Law, Law and Economics Center (1991).

268 Wright, 'Antitrust, Multidimensional Competition and Innovation' (n 258) 241.

269 Ibid 233

270 Ibid 251.

271 Gilbert and Sunshine (n 247); Marcus Glader, Innovation Markets and Competition Analysis: EU Competition Law and US Antitrust Law (Edward Elgar 2006).

272 Michael A Carrier, 'Resolving the Patent-Antitrust Paradox Through Tripartite Innovation' (2003) 56 Vanderbilt Law Review 1047.

273 Assuming that innovation is the first order preference of consumers and that dynamic competition is the process that enables consumers to maximise their utility, the concepts of "dynamic efficiency" and "dynamic competition" are close to each other and can be used interchangeably.

274 US DOJ and FTC Guidelines on the licensing of IP rights, (n 220) Section 3.2. The distinction between these three markets was first noted by William F Baxter, 'The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies' (1984) 53 Antitrust Law Journal 717.

analytical tools to predict changes in the price or output of goods and services.

According to the US DOJ and FTC Guidelines, technology markets consist of the intellectual property that is licensed and its close substitutes, technologies or goods that are close enough substitutes significantly to constrain the exercise of market power with respect to the intellectual property that is licensed. The concept is used when rights to intellectual property are marketed separately from the products in which they are used, technology being an input, which is integrated either into a product or a production process. That would be the case, for example, of an upstream firm that is not vertically integrated downstream to the production and commercialisation of the products. The concept is referred to also in the EU Block exemption regulation on the transfer of technology agreements and Guidelines.[275] The delineate the relevant technology market, both the European Commission and the US Agencies will apply the hypothetical monopolist test (or SSNIP test),[276] which identifies the smallest group of technologies and goods over which a hypothetical monopolist of those technologies and goods likely would exercise market power, by imposing a small but significant and non-transitory increase of the price (e.g. the royalties) of a level of 5–10%.

The concept of innovation markets enables competition authorities to assess the effects of an anticompetitive practice on research and development efforts and eventually future product markets. Gilbert and Sunshine have suggested a five steps process for identifying innovation markets: first, identify the overlapping R&D activities of the merging firms, second, locate any alternative sources of R&D, third, evaluate actual and potential competition from downstream products that could make it unprofitable for a hypothetical R&D monopolist to raise price or reduce output; fourth, assess potential competitive effects on investment and R&D that could result from the increased concentration brought about by the practice; fifth, assess any efficiencies arising from the practice that would likely increase output and lower the post-practice price of R&D in the innovation market under review, in order to determine whether such efficiencies would be sufficient to outweigh any likely anticompetitive effects.[277] An alternative to the innovation markets approach would be to use potential competition theory and in particular consider the possibility of limit pricing, the strategy of constraining price in order to reduce the risk of future entry.[278] Applying potential competition analysis would however require that one of the firms is already an established supplier of the relevant good and service, which is not always the case and some effects, for example possible delays in introducing a new drug in the market, cannot be captured by the tool of potential competition.[279] The concept of innovation market thus extends the ability of competition law to assess effects on research tools or processes competition.

The concept has nevertheless been subject to a number of criticisms: first, R&D is only an input to the production of goods and services and competition law analysis should focus on outputs, the actual supply of future goods and services; second, the sources of R&D may be difficult to identify as discoveries may come from unexpected places; third, economic theory does not provide a solid empirical basis on the assumption that the decrease in the number of firms engaged in R&D will affect negatively innovation (the link between market structure and innovation), as the elimination of redundant expenditure, the reduction of costs and the possibility for the firm to fully capture the results of the R&D programme might accelerate the process of innovation (if one takes a Schumpeterian view).[280]

Recognizing that a licensing arrangement may affect the development of goods that do not yet exist, the US DOJ & FTC Guidelines acknowledge that they will analyse such an impact either as a separate competitive effect in relevant goods or technology markets, or as a competitive effect in a separate innovation market.[281] The concept will be used only when the capabilities to engage in the relevant research and development can be associated with specialized assets or characteristics of specific firms. The authorities will rely on market data or evidence from buyers' and market participants' assessments of the competitive significance of innovation market players. The use of this concept in some high profile merger cases has been controversial.[282]

From the other side of the Atlantic, the EU Guidelines do not ascribe the same importance to this concept than to that of technology markets. The Commission accepts that licence agreements may affect innovation markets, but in analysing such effects, the Commission prefers to confine itself to examining the impact of the agreement on competition within existing product and technology markets. It is only in a limited number of cases that it might be useful and necessary to also define innovation markets, for example where the agreement affects innovation aiming at creating new products and where it is possible at an early stage to identify research and development poles, in which cases it will analyse whether after the agreement there will be a sufficient number of competing research and development poles left for effective competition in innovation to be maintained.

275 Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements (n 106) para 19–25.

276 Small but Significant and Non-transitory Increase in Price test.

277 Gilbert and Sunshine (n 247) 596–597.

278 Robert J Hoerner, 'Innovation Markets: New Wine in Old Bottles?' (1995) 64 Antitrust Law Journal 49.

279 Richard J Gilbert, 'Competition and Innovation' in Wayne D Collins (ed) 1 ABA Section of Antitrust Law, Issues in Competition Law and Policy 577, 583 (American Bar Association 2008) Ch 26.

280 Ibid.

281 US DOJ and FTC Guidelines on licensing IP rights (n 220), Section 3.2.3.

282 See, for instance, Genzyme Corporation / Novazyme Pharmaceuticals, Inc. and the statement of Chairman T. Muris (critical to the use of the concept): <http://www.ftc.gov/os/2004/01/murisgenzymestmt.pdf> accessed 28 April 2013.

(iii) Dynamic analysis in the context of competition law assessment in merger control and antitrust

In most cases, dynamic analysis is incorporated in competition law assessment with the consideration of "dynamic efficiencies". As it has been noted by some commentators, "dynamic efficiency in competition economics is connected to whether appropriate incentives and ability exist to increase productivity and engage in innovative activity over time, which may yield cheaper or better goods or new products that afford consumers more satisfaction than previous consumption choices", the concept relating to "the ability of a firm, industry or economy to exploit its potential to innovate, develop new technologies and thus expand its production possibility frontier".[283] Both static and dynamic efficiencies should be taken into account in competition law enforcement. We have previously noted that the evidential requirements for the proof of efficiency gains in competition law, in particular in the context of the EU, might render more difficult the consideration of dynamic efficiencies.[284]

The main difficulties relate, first, to the verification requirement as well as to the requirement that efficiency gains and their passing on to consumers (whose position should not be worse than that prior the anticompetitive conduct) must be probable enough, in view of the fact that the burden of proof rests on the defendants.[285] Firms may have difficulty to meeting the requisite level of proof with regard to causation and the quantification of the incremental surplus created by the additional innovative effort, most of which will relate to future products.[286] Remote dynamic efficiencies may also be discounted to some extent against short-term anticompetitive effects. Second, the requirement that restrictions should be indispensable for the realization of dynamic efficiency gains (in merger control, any dynamic efficiency put forward should be merger specific) raises the issue of causation and of the existence of less restrictive to competition alternatives to achieve the same dynamic efficiency gain.[287] Third the trade-off between static allocative inefficiency, because of higher prices, and dynamic efficiency is particularly difficult to make. Some have opted for a "dynamic pure consumer welfare standard", in order to balance any consumer harms flowing from short run price increases with consumer benefits from price decreases in the longer run resulting from diffusion of the merger-induced cost reductions to other competitors.[288] However, as we have highlighted above, applying an appropriate discount rate to future time periods, in order to ensure that greater weight will be given to relatively more certain, short run, effects than uncertain dynamic efficiencies, might defeat the purpose of favoring "dynamic competition". In conclusion, the static and dynamic efficiency trade-off will in most cases take the form of a "rough comparison".[289]

A possible solution to the risk of over-considering static allocative inefficiency effects would be to weigh more heavily liked dynamic efficiencies than static effects. Tepperman and Sanderson provide two reasons for that.[290] First, there may be many sources for dynamic efficiencies, while only one for allocative inefficiency, in view of the important spill-over effects that innovation in one market or sector might bring to other markets or sectors and thus to a different set of consumers. This effect is not taken into account by conventional competition law analysis that focuses on the effects on a relevant market (as a result of the partial equilibrium analysis performed) and does not incorporate in the analysis cross-market effects. The European Commission takes into account the positive welfare effects of an agreement as long as "the group of consumers affected by the restriction and benefiting from the efficiency gains are substantially the same."[291] The Court's position on this issue seems more liberal. In a number of cases on the application of Article 101 (3) the Court had regard to advantages arising from the agreement, not only for the specific relevant market but also for "every other market on which the agreement in question might have beneficial effects".[292] Second, price effects tend generally to be transitory, given the dynamically competitive nature of competition, as higher profitability will generally attract new entry and a new round of innovation in order to displace the leader. This

283 Andrej Fatur, EU Competition Law and the Information and Communication Technology Network Industries (Hart Publishing 2012) 40. See also, Jesús Huerta De Soto, The Theory of Dynamic Efficiency (Routledge 2009).

284 The US Guidelines seem to offer more flexibility to the parties to argue efficiency gains. The comparison of anticompetitive harms and procompetitive efficiencies will "necessarily" be a qualitative one.

285 E.g. according to the Guidelines on the Assessment of Horizontal Mergers under the Council Regulation on the Control of Concentrations between Undertakings (EC) [2004] OJ C31/03, paras 79–88, efficiency claims have to be 'substantiated', 'verifiable', 'precise and convincing', and should be quantified ' [w] here reasonably possible'. Section 9.3 of Form CO requires notifying parties making efficiency claims to provide detailed quantification, including estimated cost savings and assessments of the significance of new product introductions and improvements.

286 For a detailed analysis, see Christian R Fackelmann, 'Dynamic Efficiency Considerations in EC Merger Control. An Intractable Subject or a Promising Chance for Innovation?' Oxford Centre for Competition Law and Policy Working Paper No. L-09/06, pp. 23–32 (concluding that "quantification of dynamic efficiencies appears to be beyond the (pre-sent) powers of economic analysis, let alone of enforcement practice". Even if the assessment of dynamic efficiencies is purely qualitative, the EU Horizontal Merger Guidelines require firms to provide material on the basis of which a "clearly identifiable positive impact on consumers, not a marginal one", thus raising the standard of proof for the parties).

287 EU Commission's Guidelines on the application of Article 81 of the EC Treaty [now Article 101 TFEU] to technology transfer agreements (n 106) require undertakings arguing dynamic efficiency gains to explain and demonstrate why seemingly realistic and significantly less restrictive alternatives would be significantly less efficient from a dynamic perspective. Again, the US Agencies seem more flexible. The US Guidelines note that "the Agencies will not engage in a search for a theoretically least restrictive alternative that is not realistic in the practical prospective business situation faced by the parties".

288 Steven C Salop, 'Efficiencies in Dynamic Merger Analysis' (1995), Statement at FTC Hearings on Global and Innovation-Based Competition, available at www.ftc.gov/opp/global/saloptst.htm accessed 29 April 2013.

289 Tepperman and Sanderson (n 94) 33

290 Ibid

291 European Commission, Notice – Guidelines on the application of article 101 (3) (n 107) para. 43. The Commission notes, however, in its Horizontal Merger Guidelines (n 278) para. 79, that "(c)onsumers may also benefit from new or improved products or services, for instance resulting from efficiency gains in the sphere of R&D and innovation", thus not confining the consideration of efficiencies to a specific relevant market.

292 Case T-86/95 Compagnie générale maritime and others v Commission [2002] ECR II-2011, para. 130; Case T-213/00 CMA GCM & Others v Commission [2003] ECR II-913, para. 227.

conclusion relies on the assumption that the market leader would not be able to block or deter entry through the exercise of exclusive rights (e.g. IP rights) or strategic conduct (e.g. predatory pricing, tying).

What are the different sources of dynamic efficiency gains?[293] First, dynamic efficiency gains may derive from variable and fixed costs savings across time. Second, they may arise from a combination of R&D programs or different capabilities creating synergies (these may relate to the integration of R&D activity, productive assets or distribution capacity, that is different segments of the innovative process). In the case of R&D synergies this might reduce the risk of a wasteful duplication and the elimination of redundant R&D. Third, they might be economies of scale or scope in R&D activities, the assumption being that an R&D program of some size is more productive than two separate programs of half size. The avoidance of patent thickets issues and a better IP rights enforcement might also be considered as enhancing dynamic efficiency, by enhancing returns to R&D efforts. Increased financial resources on innovation and improving the spread of R&D risk constitute further sources of dynamic efficiency gains.

It is worthy of note that neither the EU Guidelines on the Transfer of Technology nor the US Guidelines on the licensing of IP examine the different sources of dynamic efficiency and provide guidance on how the trade-off between static and dynamic efficiency will be done in practice. The Guidelines prefer a general presumptions approach that would assume the existence of dynamic efficiencies if the licensing arrangement falls within one of the two safe harbours of the regulation (structural indicators, such as market shares or the number of technologies available). The more recent US Horizontal Merger Guidelines include a new section on innovation and product variety, which incorporates dynamic competition in the analysis of anticompetitive effects. It is recognized that "competition often spurs firms to innovate" and that the US Agencies will intervene if "a merger is likely to curtail the merger firm's innovative effort below the level that would prevail in the absence of the merger".[294] The possible effects on innovation could take different forms, such as a reduced incentive to continue with an existing product-development effort or a reduced incentive to initiate the development of new products. With regard to dynamic efficiencies, the Guidelines note that "in evaluating the effects of a merger on innovation, the Agencies consider the ability of the merged firm to conduct research or development more effectively", in particular if this may spur innovation without affecting short-term pricing.[295] Yet, it is also recognized that "the Agencies should consider the ability of the merger firm to appropriate a greater fraction of the benefits resulting from its innovations", including licensing and intellectual property conditions, which "affect the ability of a firm to appropriate the benefits of its innovation". Although the Guidelines acknowledge that most weight is given to the results of competition analysis over the short term, it is also noted that "(r)esearch and development cost savings may be substantial and yet not be cognizable efficiencies because they are difficult to verify or result from anticompetitive reductions in innovative activities", thus opening the door to a more flexible consideration of dynamic efficiencies.

The trade-off between static anticompetitive effects (allocative inefficiency) and dynamic efficiencies may even be more complicated in a multi-jurisdictional setting. One may envisage a situation in which a licensing practice affects consumers in jurisdiction A but enables a licensor established in jurisdiction B to profit from dynamic efficiency gains. In principle, this should not pose a problem, as the consumers of jurisdiction A would eventually benefit from the outcome of the innovation in the long run. Yet, it is possible that the product will first be introduced in the market of jurisdiction B, thus benefiting the consumers of this jurisdiction, without the consumers of jurisdiction A being able to enjoy within a reasonable time frame, for different reasons, the benefits of the sacrifice of allocative efficiency for the purposes of innovation. This issue may become a concern, from a political economy perspective, if the core of the inventive activity is concentrated in some jurisdictions only.

d. The need to apply an overall "decision theory" framework

It should be clear by now that the case law has developed multiple standards in order to tackle the anticompetitive exercise of intellectual property rights. Despite the use of the "property rights" rhetoric, the competition law authorities and the courts do not apply the essential facilities doctrine and take into account the need to protect innovation. The standards used are nevertheless complex and fact-specific and ultimately a source of uncertainty for firms.

The need for an overall approach is highlighted by Ahlbors, Evans and Padilla who suggest an "error-cost framework", which is structured in two stages. First, economic theory and evidence will be used "to assess the cost and likelihood of errors resulting from condemning welfare-increasing business practices or condoning welfare reducing ones"; In a second stage, "a legal rule that minimizes the expected cost of intervention taking into account the possibility of legal error" will be "selected from a spectrum of standards ranging from per se legality to per se illegality, including the rule of reason".[296] The authors start from the assumption that "what matters is the impact of forcing access on the incentives to innovate, and not the nature of the property rights at stake".[297] What applies to intellectual property rights should also apply to other property rights as both are "the result of previous investment or risk taking".[298]

This starting position may be criticised as it is not always true that IP rights are the result of significant previous investment

293 Tepperman and Sanderson (n 94) 34–38.

294 US DOJ & FTC Horizontal Merger Guidelines (2010), available at <http://www.ftc.gov/os/2010/08/100819hmg.pdf> Section 6.4

295 Ibid Section 10.

296 Ahlborn, Evans and Padilla (n 161)

297 Ibid 1141.

298 Ibid and 1156.

or risk taking. In addition, this approach does not take into account the different degrees of "previous investment and risk taking". An insignificant inventive effort will be considered the same way a significant one would be. The authors' assumption may be explained by the fact that they try to avoid the difficulties of balancing incentives to innovate with anticompetitive effects (allocative inefficiencies), which, they consider, is "an extremely complex" and "daunting task" for courts.[299] However, even if one could agree that this is an important issue which has not yet been resolved, this is not a valid reason to adopt such a strong assumption.

According to Ahlborn, Evans and Padilla, the existence of compulsory licensing will inevitably reduce the incentive ex ante for the IP holder to take the risk to invest in new products.[300] However, even if this hypothesis may be a plausible generalisation, it does not always hold. Increasing competition in the secondary market will exercise pressure on the IP holder to innovate as this will be the only way to maintain its competitive advantage against its competitors. The disincentive created by the compulsory license may well exist but it is also important to consider that the IP holders will still have a first mover advantage as it would probably not be before a substantial period of time that their rivals would be able to compete in equal terms. Moreover, it would be possible for the inventor to increase his revenues from licensing.

Furthermore, Ahlborn, Evans and Padilla apply the "cost-error framework" to antitrust but not to intellectual property, which, they assume, is the outcome of a meritorious investment and "risk taking" process.[301] However, this double standard is not justifiable. Ironically, this approach supposes that decision analysis theory may be useful for assessing antitrust, which is essentially a judge-made law that follows an adversarial process but not for examining IP rights, which are granted by a regulatory body and therefore it is more likely to be subject to decision errors or capture. Indeed, the protection of IP has expanded considerably the last twenty years following the transformation of economic structures and the focus on international competitiveness. Even trivial "inventions" may benefit from an IP protection. The ex post case by case analysis of competition law may be at certain regards superior than the ex ante approach of intellectual property, as market information is most likely available after the IP rights has been granted. However, a procedure of post-grant review may mitigate this concern.

Furthermore, the protection of intellectual property is backwards looking. The examination of the patent application focuses on the "prior art" and there is no assessment of the existence of possible substitutes or potential competition. The problem is particularly acute in emerging industries where prior art is difficult to locate as it is disseminated in scientific journals or in the form of informal know how, with the result that the patent officer's examination can be easily flawed, from a welfare perspective.

299 Ibid 1143 to 1144.
300 Ibid 1129.
301 Ibid 1141.

Type I errors (over-expansion of IP rights) are therefore more likely to happen than type II errors (under-inclusiveness of IP protection). By limiting the negative effects of type I errors, caused by a broad intellectual property protection, competition law is a necessary complement to intellectual property law.

On the above basis, competition law's intervention is justified if IP law has failed to guarantee the level of innovation in the market.[302] This is what happened in Magill where intellectual property rights were granted to simple data without any inventive effort having been made. The European Community's Directive on the Legal Protection of databases, which provides high levels of protection for databases may illustrate the side-effects of a careless intellectual property protection.[303] The Directive was adopted following an intense effort of lobbying by database companies and is a compromise between the lower "sweat of the brow" copyright protection that was granted to databases in some EU Member States (e.g. UK, Ireland) and the higher standard of copyright protection granted by other Member States (e.g. France). The directive established a legal framework giving a high level of copyright protection to "original" databases, which "by reason of the selection or arrangement of their contents constitute the author's own intellectual creation"[304] and a new form of "sui generis" protection to non-original databases if the "maker" of the database showed "that there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents" of the database.[305]

The Directive protects a simple compilation of existing basic information, which is the result of some kind of investment. The objective of this form of IP protection is therefore not to protect innovation but to protect the investments of the database "makers" against the "parasitic behaviour" of free riders.[306] The sui generis protection granted has the potential to produce important anticompetitive effects. Contrary to a copyright protection, which distinguishes between the idea, which stays in the public domain, and the expression of the idea, which is protected, the database directive gives the possibility to exclude the re-utilisation of the data by others. This is particularly risky for competition, "in cases, where a database is the only possible source of the data contained therein, such as telephone directories, television program listings or schedules of sporting events" and may result in "an absolute downstream information monopoly in derivative information products and services".[307]

302 Thomas Dreier, 'Balancing Proprietary and Public Domain Interests: Inside or Outside of Proprietary Rights?' in Rochelle C Dreyfuss, Harry First and Diane Zimmerman (eds) Expanding the Boundaries of Intellectual Property (Oxford University Press 2001) 295, 312 (antitrust remedies "should be reserved for exceptional situations where intellectual property law has failed").
303 Parliament and Council Directive 96/9/EC (n 38).
304 Ibid Art. 3 (1).
305 Ibid Art. 7 (1).
306 First Evaluation of Directive 96/9/EC (n 39) One could remark the "free riders" property rights rhetoric used by the Commission.
307 P Bernt Hugenhotz 'Abuse of Database Right: Sole-Source Information Banks under the EU Database Directive' in Lévêque and Shelanski (eds) (n 129) 203.

In response to this risk, article 16 of the Directive required the Commission to submit a report examining whether the application of the sui generis right "has led to abuse of a dominant position or other interference with free competition which would justify appropriate measures being taken, including the establishment of non-voluntary licensing arrangements." Indeed, while the first proposal of the Database Directive provided for the possibility of compulsory licensing in order to limit the risk of anti-competitive effects, these provisions have been removed from the final version of the Directive, which only limited the right of the database "maker" in exceptional circumstances.[308] This is probably why recital 47 provides that the Directive is without prejudice to the application of Community or national competition rules, making it therefore possible to limit the rights of the database "makers" through competition law. The application of competition law can therefore be seen to be triggered by the failure of the text of the database Directive to take properly into account the protection of cumulative innovation and competition.

It is remarkable that the national courts and the European Court of Justice have interpreted the "quantitative substantial investment" requirement of the Directive restrictively in order to avoid the emergence of anticompetitive effects.[309] Indeed, the ECJ curtailed the scope of the protection by explicitly refusing to adopt the "spin off" doctrine, developed by some Dutch courts, which would make it possible to provide sui generis protection for databases generated as "by-products" of the main activities of the Database "maker" on which the later has a de facto monopoly (e.g. television program listings, railway schedules etc), which is the situation that arose in Magill.[310] The ECJ distinguished between creating and obtaining data in order to assemble the contents of a database.[311] It also considered that the activity of creating materials that make up the content of a database did not constitute substantial investment in the sense of the directive and that therefore a single-source database was not protected under sui generis rights.[312]

By adopting a narrow interpretation of the scope of the Directive the Court avoided the situation where single-source databases would benefit from the sui generis protection and as a result enable the database "makers" to abuse their dominant position on the information they create. The recent evaluation report of the Database directive also considers the risk of potential anticompetitive effects and examines different options, ranging from the simple repeal of the Directive to the preservation of the status-quo. While the Commission notes the "attachment" of the EU database industry to the sui generis protection for factual compilations and their "considerable resistance" to any reform (an indication of the "specific-interest group" character of this legislation), it also remarks on the weak empirical support for such a system of protection.[313] Less restrictive to competition alternatives for protecting the investments made exist. Indeed, the United States opted for a system of liability and not of property rights in protecting the investments of the database "makers".[314] The US approach is based on unfair competition principles which protect the database "maker" against misappropriation only if, as a result, there will be market harm.[315]

The limitation of the scope of intellectual property protection makes it also possible to consider ex ante (before the grant of the IP right) the effects of intellectual property protection on competition and constitutes therefore a conceivable option for attaining the right balance between competition law and intellectual property.[316] The European Commission's proposal to amend Directive 98/71/EC on the legal protection of designs[317] illustrates the dialectic relationship between the scope of IP rights and competition law.[318] By removing Members States' option to provide design protection for spare parts of complex products, such as automobiles, the Commission seeks to avoid the constitution of monopolies in the aftermarket for spare parts for which "there is no practical alternative".[319] The proposal codifies the case law of the ECJ in Renault and Volvo, whose effect could have been curtailed by the generalisation of the "new product rule" to all refusals to license IP rights, following the ECJ's judgment in IMS/NDC some months earlier.

308 Proposal for a Council Directive on the Legal Protection of Databases, COM (92) 24 final, OJ 1992 C 156/4, art. 8 (1) and 8 (2).

309 Case C-46/02 Fixtures Marketing Ltd. V Oy Veikkaus Ab [2004] ECR I-10365; Case C-203/02 The British Horseracing Board Ltd and Others v William Hill Organisation Ltd [2004] ECR I-10415; Case C-338/02 Fixtures Marketing Limited v. AB Svenska Spel [2004] ECR I-10497; Case C-444/02 Fixtures Marketing Ltd v. Organismos Prognostikon Agonon Podosfairou AE – OPAP [2004] ECR I-10549. For an analysis of national courts' decisions, see First Evaluation of Directive 96/9/EC (n 39) p. 11.

310 Estelle Derclaye, 'Databases Sui Generis Right: Should We Adopt the Spin-off Theory' (2004) 26 (9) European Intellectual Property Review 402.

311 Case C-46/02 Fixtures Marketing Ltd. V. Oy Veikkaus Ab (s 302) para 34 ("the expression 'investment in […] the obtaining […] of the contents' of a database must […] be understood to refer to the resources used to seek out existing independent materials and collect them in the database, and not to the resources used for the creation as such of independent materials").

312 Case C-203/02 The British Horseracing Board Ltd and Others v. William Hill Organisation Ltd, (s 302) para 35; Mark J Davison and P Bernt Hugenholtz 'Football Fixtures, Horseraces and Spin Offs: The ECJ Domesticates the Database Right' (2005) European Intellectual Property Review 113; Estelle Derclaye, 'The Court of Justice Interprets the Database Sui Generis Right for the First Time' (2005) European Law Review 420.

313 First Evaluation of Directive 96/9/EC (n 39) p. 5.

314 Feist Publications v Rural Telephone Service Company, 499 U.S. 340 (1991) [The Supreme Court refused to accept that information contained in a telephone directory could be protected under copyright laws. A database may only be copyrighted if it possesses some "minimal degree of creativity"].

315 Guido Westkamp 'Protecting Databases under US and European Law: Methodical Approaches to the Protection of Investments between Unfair Competition and Intellectual Property Concepts' (2003) 34 International Review of Industrial Property and Copyright Law 772.

316 The adjustment of the duration of the IP protection is another option. See, Kaplow 'The Patent-Antitrust Intersection: A Reappraisal' (n 206) 1840 (" […] setting the patent life and determining patent-antitrust doctrine are interdependent endeavors; in other words, the system of equations that defines the optimization process must be solved simultaneously"). However, this is unlikely to happen as the duration of the IP protection is usually determined by international treaties, which is impossible or extremely difficult to amend.

317 Directive 98/71/EC on the legal protection of designs [1998] OJ L 289/28.

318 Proposal for a Directive of the European Parliament and of the Council amending Directive 98/71/EC on the legal protection of designs COM (2004) 582 final.

319 Ibid 9.

C. Illustrations of the Interaction Between Competition Law and IP Rights: a Comparative EU/US Perspective

1. The Patenting Process and Unreasonable Patent Exclusions

a. Refusal to license

Both EU and US competition law start from the general rule that a duty to deal with a competitor should be rarely imposed to dominant undertakings. There is no obligation for the IP holder to license the use of their IPRs to others. This rule may be explained for three reasons, all accepted as significant in both US antitrust and EU competition law. First, undertakings should have the right to choose their trading partners and to dispose freely of their property.[320] Second, existence of an obligation to license, even for a fair remuneration, "may undermine undertakings' incentives to invest and innovate and, thereby, possibly harm consumers".[321] Third, at least in US antitrust law, this cautious approach may also be explained by a concern over the administrability of competition law, as "an antitrust court is unlikely to be an effective day-to-day enforcer of these detailed sharing obligations", should a duty to license be imposed more frequently.[322]

In US antitrust law, unilateral refusals to license have been dealt under the following three broad standards.[323] In Data General Corp. v Grumman Systems, the First circuit although it noted that "exclusionary conduct can include a monopolist's unilateral refusal to license a copyright", it created a rebuttable presumption that unilateral refusals to license is a "presumptively valid business justification for any immediate harm to consumers".[324] In Image Technical Services v Eastman Kodak, the Ninth circuit modified slightly that presumption to emphasize more market reality.[325] The court recognized that, although intellectual property owners are not immune from antitrust liability, "patent and copyright holders may refuse to sell or license protected work". Yet, it also noted that intellectual property justifications in this case were pretextual, hence bringing forward the role of intent in the analysis, noting that "neither the aims of intellectual property law, or the antitrust laws justify allowing a monopolist to rely upon a pretextual business justification to mask anticompetitive conduct".[326] Finally, in Re Independent Service Organizations Antitrust Litigation, the Federal Circuit rejected the presumptive legality approach for one that would extend antitrust immunity to refusals to license, in the absence of any indication of illegal tying, fraud in the Patent and Trademark Office or sham litigation.[327] The Federal Circuit created a rule of per se legality for refusals to license, even in cases in which the refusal to license would have the effect to influence a market other than that covered by the relevant IPR.[328] Following the Supreme Court's judgment in *Verizon Communications v Law Offices of Curtis V Trinko*, it looks highly unlikely that a unilateral refusal to deal (and even more a unilateral refusal to license) would be found to violate Section 2 of the Sherman Act.[329]

In the context of EU competition law, the application of article 102 TFEU, prohibiting the abuses by an undertaking of its dominant position, to unilateral refusals to license IP rights has been an important issue since the decisions of the ECJ in Volvo v Veng and CICRA v Renault.[330] In these cases, the ECJ held that the right of the proprietor of a protected design to prevent third parties from manufacturing and selling or importing without its consent products incorporating the design does not constitute an abuse of a dominant position. Otherwise, the IP holder would be deprived of the substance of his exclusive right. However, the Court did not go as far as to create an irrebutable presumption for the exercise of IP rights. A refusal to license may constitute an abuse if the exercise of the IP right would involve, in the part of the undertaking, "certain abusive conduct", such as an arbitrary refusal to supply spare parts to independent repairers, the fixing of prices at an unfair level or a decision no longer to produce spare parts for a particular model.[331] In subsequent decisions, the Court extended the scope of article 102 TFEU to cover the acquisition by a dominant firm of an exclusive patent license of an

320 Guidance Paper (n 247) para. 75; See also in US antitrust law, United States v Colgate & Co., 250 U.S. 300, 307 (1919) " [i]n the absence of any purpose to create or maintain a monopoly, the [Sherman Act] does not restrict the long recognized right of [a] trader or manufacturer engaged in an entirely private business, freely to exercise his own independent discretion as to parties with whom he will deal".

321 Guidance Paper (n 247) para. 75; See also in US antitrust law, Trinko (n 119) ("Firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. Compelling such firms to share the source of their advantage is in some tension with the underlying purpose of antitrust law, since it may lessen the incentive for the monopolist, the rival, or both to invest in those economically beneficial facilities").

322 In Trinko, the Court was cautious in finding exceptions to the general rule of no duty to aid a rival, precisely "because of the uncertain virtue of forced sharing and the difficulty of identifying and remedying anticompetitive conduct by a single firm".

323 Herbert Hovenkamp, Mark D Janis and Mark A Lemley, 'Unilateral Refusals to License' (2006) 2 (1) Journal of Competition Law & Economics 1.

324 Data General Corp. v Grumman Systems, 36 F2d 1147, 1187 (1st Cir. 1994) ("an author's desire to exclude others from use of its copyrighted work is a presumptively valid business justification for any immediate harm to consumers").

325 Image Technical Services v Eastman Kodak, 125 F3d 1195 (9th Cir. 1997).

326 Ibid, pp. 1219–1220.

327 Re Independent Service Organizations Antitrust Litigation, 203 F.3d 1322 (Fed. Cir. 2000).

328 Ibid, pp. 1327–1328. The Court held that patents could entitle the patent holder to control secondary markets: in this case Xerox's part patents enabled Xerox to control the market for service of Xerox copiers as well.

329 Trinko case (n 119), the Supreme Court noting "the few existing exceptions from the proposition that there is no duty to aid competitors".

330 Case 53/87 CICCRA v Renault [1988] ECR 6039; Case 238/87 Volvo v Veng [1988] ECR 6211.

331 Case 53/87 Renault, (n 323) para 9

alternative technology[332] or a refusal to license IP rights in order to defend an existing monopoly power.[333]

The case law has moved subsequently to develop a standard which takes into consideration the specificity of intellectual property rights. The ECJ adopted the "new product" rule in Magill where it held that the exercise of an exclusive right by the intellectual property owner may, in "exceptional circumstances", involve abusive conduct.[334] Exceptional circumstances consist of the following: (i) access is indispensable, (ii) the refusal to license prevented the appearance of a new product for which there was potential consumer demand, (iii) there was no justification for such refusal, (iv) the refusal to license excluded all competition on the secondary market. By insisting on the requirement that the refusal to license prevented the sale of a new kind of product for which there was unsatisfied demand, the ECJ appeared to consider the necessity to protect innovation in the market. In Magill, the refusal to license had impeded the emergence of a new product, a composite TV guide, which the holders of the intellectual property right did not offer and for which there was a potential demand. The weak and questionable nature of the IP right that was involved in this case, a copyright protection granted on simple TV listings under a "sweet of the brow" standard, may explain the position of the Court, in particular as access to these data was indispensable for the emergence of the new product. The judgment was not also clear as to the cumulative or alternative character of these exceptional circumstances and some confusion resulted from a subsequent case of the General Court, which treated conditions (i) and (ii) of Magill as alternative rather than cumulative.[335]

In the meantime, the Court of Justice in Oscar Bronner, a case which did not involve a refusal to license but the refusal by a dominant firm to share its distribution network with a competitor, interpreted the four conditions of Magill as being cumulative and narrowed down the duty to deal doctrine in EU competition law, by interpreting the indispensability condition as requiring evidence from the undertaking requesting access that it should not be economically viable for an undertaking with a comparable size with the dominant firm to develop its own facility or input.[336]

In IMS/NDC Health,[337] the ECJ reaffirmed the cumulative character of these conditions and explained that the "new product or service" rule limits the finding of abuse for a refusal to licence "only where the undertaking which requested the licence does not intend to limit itself essentially to duplicating the goods or services already offered on the secondary market by the owner of the copyright, but intends to produce new goods or services not offered by the owner of the right and for which there is a potential consumer demand".[338] In Renault and Volvo, both of which involved rights of design on spare parts, the exceptional circumstances were held to exist even if the refusal to license did not impede the emergence of a new product. The identification of two different but interconnected stages of production is also important, as it is only if the upstream products or services are an indispensable input for the supply of the downstream product that a refusal to licence may fall within the scope of article 102 TFEU. Yet, as the Court noted, it is sufficient to identify a captive, potential or hypothetical input market, for example by distinguishing between the different stages of the innovation process, the intellectual property right being one of them.[339]

In its recent Enforcement Priorities Guidance on exclusionary abuses,[340] the Commission notes that it will consider unilateral or "constructive"[341] refusals to deal as an enforcement priority if all the following circumstances are present: (i) the refusal relates to a product or service that is objectively necessary to be able to compete effectively on a downstream market, (ii) the refusal is likely to lead to the elimination of effective competition on the downstream market, and (iii) the refusal is likely to lead to consumer harm.[342] As it becomes clear, the third condition did not exist as such in the case law of the EU courts. The Commission emphasizes the interest of consumers and indicates that it will examine the likely negative consequences of the refusal to supply in the relevant market outweigh over time the negative consequences of imposing an obligation to supply. Preventing innovation, in particular stifling follow-on (cumulative) innovation constitutes an example of possible consumer harm. The Guidance also takes a more liberal view of the condition of indispensability, as the fact that the licensee does not intend to limit herself essentially to duplicating the goods or services already offered on the secondary market is not the only instance in which cumulative innovation may be considered as likely to be stifled. The Commission adopts instead a wider interpretation of the restrictive effect on innovation. With regard to possible objective justifications, the Guidance recognizes two instances which may give rise to such claims by IPR holders: the need to allow the dominant undertaking to realize an adequate return on the investment required for the development of its input business and the need for the undertaking to generate incentives to invest in the future, taking the risk of failed projects into account.[343] These efficiency gains should however be examined under the four conditions test for efficiencies, described below.

In contrast to US antitrust law, refusals to provide interoperability are assessed in the EU under the broader category

332 Case T-51/89 Tetra Pak [1990] ECR II-309.

333 Case T-504/93 Tiercé Ladbroke SA v. Commission [1997] ECR II-923 (the objective of the French race courses was not to extent their monopoly in Belgium (leverage theory) but to protect their monopoly in the French market, which could be threatened if the Belgian companies were able to take bets for French races).

334 ECJ, Joined Cases C-241/91 and C-242/91, Radio Telefis Eireann v Commission (Magill), ECR [1995] I-743.

335 Case T-504/93 Tierce Ladbroke SA v Commission [1995] ECR II-923.

336 Case C-7/97 Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co KG [1998] ECR I-7791.

337 IMS Health case, paras 34–35.

338 Ibid para 49 (emphasis added).

339 Ibid paras 44–45.

340 Guidance Paper (n 247).

341 For example, unduly delaying or otherwise degrading the supply of the product or imposing unreasonable conditions in return for the supply.

342 Ibid para 81.

343 Ibid para 89

of refusals to supply.[344] The Commission applied Article 102 TFEU to the refusal by Microsoft to supply Sun Microsystems the necessary information to establish interoperability between their work group server operating systems and Microsoft's PC operating system Windows.[345] Microsoft was ordered to disclose interoperability information in a reasonable, non-discriminatory and timeliness way. While the Commission did not contemplate compulsory disclosure of the source code of Windows and the disclosure measure only covered interface specifications, it acknowledged that "it cannot be excluded that ordering Microsoft to disclose such specifications and allow such use of them by third parties restricts the exercise of Microsoft's intellectual property rights".[346] Microsoft's conduct was not necessarily impeding the emergence of an identifiable new product. Microsoft's conduct had nevertheless, according to the Commission, the effect of reducing the incentives of its competitors to innovate (and produce new products in the future) and therefore to limit consumer choice. The Commission affirmed that intellectual property rights cannot as such constitute a "self-evident objective justification" for Microsoft's refusal to supply and employed a balancing test examining if the possible negative impact of an order to supply on Microsoft's incentives to innovate could be outweighed by its positive impact on the level of innovation of the whole industry (including Microsoft). Taking the view that "Microsoft's research and development efforts are […] spurred by the innovative steps its competitors take in the work group server operating" system market that "were such competitors to disappear, this would diminish Microsoft's incentives to innovate", the Commission concluded that the costs outweighed the benefits in this case.

The General Court (at the time the Court of First Instance) confirmed the Commission's Microsoft decision in 2007.[347] While it reaffirmed the four criteria of the ECJ in Magill and NDC Health it also adopted a more open-ended interpretation for some of these conditions. First, the Court used language that implied that these conditions were not the only exceptional circumstances in which the exercise of the exclusive right by the owner of the intellectual property rights may give rise to such an abuse, although it noted that the requirement "that the refusal prevents the appearance of a new product for which there is consumer demand is found only in the case-law on the exercise of an intellectual property right".[348] Second, the Court gave also a broad interpretation to the "new product rule" of IMS/NDC Health, finding that consumer injury may arise where there is a limitation not only of production or markets, but also of technical development.[349] Contrary to Magill and IMS, Microsoft's conduct did not impede the emergence of identifiable new products but affected the competitive process that would have brought about these new products in the future. Third, the Court interpreted "consumer harm" broadly noting that consumer choice would be affected if rival products of equal or better quality would not be able to compete on equal terms at the market.[350]

SUMMARY. There is a significant divergence between US antitrust law and EU competition law in the treatment of unilateral refusals to license. US antitrust law is relatively permissive for this type of conduct, even in the context of an entrenched dominant position. It is only in rare circumstances that an obligation to license has been imposed. Following the Supreme Court's judgment in Trinko, the emphasis is put on dynamic efficiency and the incentives of the dominant undertaking to invest and not on the allocative efficiency losses of monopoly pricing. On the contrary, in Europe, refusals to license may fall under Article 102 TFEU in "exceptional circumstances". The interpretation of the case law and in particular the decisional practice of the Commission and its soft law rule making activity indicate, however, that these "exceptional circumstances" have been expanded to cover an array of situations and that the conditions set by the ECJ in IMS/NDC Health do not effectively limit the scope of liability under Article 102 TFEU.

b. Anticompetitive abuses of the IP system

The value of an IP right, in particular a patent, lies in the fact that it can be enforced against infringers. However, dominant firms have been found in both US antitrust law and EU competition law to abuse the regulatory and litigation system with the aim to raise the costs of their rivals, exclude competition and ultimately harm consumers. The abuse may take the form of (i) a fraudulent litigation or some form of misrepresentation in the context of the regulatory process at the patent offices, (ii) or it might also consist of introducing litigation with the collateral purpose of imposing to the rival(s) an anticompetitive injury. In the context of patent litigation, this conduct may take the form of competition law (antitrust) counterclaims to patent infringement claims, what is generally referred to as "sham litigation" in the US or "vexatious litigation" in Europe.

It is important here to note that what constitutes a restriction of competition in these cases is not the use of the regulatory or litigation process itself but the abuse of that process. The restriction of competition flows directly from a "private" action, as the injury would have happened no matter what the government official or judge would have decided. What is important is to establish criteria enabling the decision-maker to distinguish a legitimate use of the regulatory process or the courts from the abuse of these processes.

With regard to the first type of abusive conduct, the Supreme Court held in Walker Process Equipment that a defendant in a patent suit might bring an antitrust counterclaim where the allegedly infringed patent was obtained by fraud on the PTO.[351] He must show by clear and convincing evidence that there is some fraud or "inequitable conduct" from the patent holder. Not any misrepresentation from the patent holder in the pat-

344 Ibid., para 78.
345 Commission Decision Microsoft (n 228).
346 para 546 and para 1004
347 Microsoft CFI case (n 118).
348 Ibid paras 332–334.
349 Ibid para 647.
350 Ibid para 652.
351 Walker Process Equipment v Food Mach. & Chem Corp., 382 US 172 (1965).

ent application process is sufficient to make a patent unenforceable. The US courts require high standards for the proof of "inequitable conduct": this includes a misrepresentation of a material fact, the falsity of that representation, the intent to deceive, a justifiable reliance upon the representation by the party deceived and a showing of "materiality", that is injury to the party deceived as result of the misrepresentation (the patent examiner would not have issued the patent if the misrepresentation was not made).[352] The important question to ask, once the infringement action is filed is whether the infringement plaintiff knew or should have known that the action is improper. In addition to "fraud" or "inequitable conduct" element of the offense, which has been broadly interpreted,[353] US courts require, as in all Section 2 Sherman Act cases, evidence that the conduct is reasonably capable of maintaining or extending monopoly power by impairing the opportunities of rivals.

In the EU, the Commission and the EU Courts may also apply Article 102 TFEU to fraudulent misrepresentations by a dominant undertaking to a Patent Office (during opposition and appeal procedures) or a national court (during patent litigation) in order to procure IP rights. For example, in 2005 the European Commission found Astra Zeneca guilty of having abused dominance by using its IPRs and the pharmaceutical regulatory system to prevent or delay the marketing of generic versions of its ulcer treatment drug, Losec.[354] Astra Zeneca had submitted misleading information to national patent offices in order to acquire supplementary protection certificates (SPCs) which would extent the patent protection for Losec and then defending those in court . It had also misused national rules by launching a tablet form of the drug and withdrawing authorizations for the original version of its drug Losec in certain national markets where patents or SPCs were due to expire. The General Court upheld the decision of the Commission finding that the misleading nature of representations made to public authorities must be assessed on the basis of objective factors, proof of the deliberate nature of the conduct and of the bad faith of the undertaking in a dominant position not being required for the purposes of identifying an abuse of a dominant position.[355] However, the ECJ found that intention was a relevant factor in the assessment of abuse in this case, the Court also emphasizing that dominant companies do not need to be "infallible" in their dealings with regulatory authorities and each objectively wrong representation will not necessarily be an abuse.[356] As a result of this case dominant companies would not be considered to have engaged in abusive conduct simply because a patent application was struck down when challenged. Indeed, "innovative companies should not refrain from acquiring a comprehensive portfolio of intellectual property rights, nor should they refrain from enforcing them".[357]

Competition authorities in Europe and the US have also found that the commencement of litigation may be abusive in limited circumstances. The reasons pushing the competition authorities to intervene against this type of conduct are not hard to imagine. First, litigation of IPRs is particularly significant in some economic sectors, such as the pharmaceutical industry, as originator companies use a variety of instruments to extend the commercial life of their medicine, including litigation.[358] Second, litigation costs are important. The European Commission found in its recent Pharmaceutical Sector Inquiry that the average duration of opposition and appeal proceedings averages 2,8 years (from 6 months to 6 years in some Member States), litigated infringement proceedings could take about 7 years, the average duration of interim injunctions granted was 18 months and litigation costs are significant in view of the fact that patent infringers (in this case generics) face multiple actions in multiple states, given the absence of a unified EU patent system.[359]

"Sham" or "vexatious" litigation refers to the predatory use of adjudicative procedures to achieve anticompetitive goals. It is a typical case of non-price predation: the predator uses legal processes to impose expenses and delay, at little cost to itself. In the United States, an exception to Noerr-Pennington immunity[360] exists where one uses the governmental process, rather than its outcome, as a sham to cover anticompetitive conduct.[361] In Europe, vexatious litigation may constitute an abuse of a dominant position, contrary to article 102 TFEU.[362] The key piece of evidence in identifying sham litigation is the absence of genuine interest in receiving judicial relief. Establishing the genuine motive of the plaintiff, therefore, has been the central issue to much of the case law on sham litigation in Europe and in the United States.

In practice, courts adopt two different approaches to identify sham claims. Some took a narrow view and defined sham litigation as a pattern of baseless claims made without regard to their merits, and designed to delay and tie up the judicial process. Others based their assessment of the real motive of

352 Nobelpharma AB v Implant Innovations, Inc., 141 F.3d 1059 (Fed. Cir. 1998). For a critical analysis of this case law see, Herbert Hovenkamp, 'The Walker Process Doctrine: Infringement Lawsuits as Antitrust Violations' University of Iowa Legal Studies Research Paper No. 08–36 (1 September 2008) available at <http://ssrn.com/abstract=1259877> accessed 28 April 2013.

353 Hovenkamp, 'The Walker Process Doctrine' (n 345) 4, noting that "infringement actions can also be qualifying exclusionary practices […] when they are based on valid patents that are known by the infringement plaintiff to be unenforceable as a result of improprieties in procurement, or on valid patents but where the infringement plaintiff knew or should have known that the infringement defendant was not an infringer" or "when the infringement plaintiff bases its cause of action on unreasonable and clearly incorrect interpretations of questions of law".

354 2006/857/EC: Commission Decision, AstraZeneca [2006] OJ L 332/24.

355 Case T-321/05, Astra Zeneca v Commission (n 204), para. 356.

356 Case C-457/10P, Astra Zeneca v. Commission (n 204).

357 Ibid para 188.

358 European Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report (2009) (n 202), noting that "(t)he number of patent litigation cases between originator and generic companies increased by a factor of four between 2000 and 2007".

359 European Commission, Pharmaceutical Sector Inquiry – Final Report (n 43), pp. 202–253 and 394–415.

360 Noerr-Pennington immunity holds that, efforts to influence public officials through lobbying, publicity, and other contact are protected by the petition clause and are not a violation of antitrust law even when the petitioning activity is undertaken for a disfavored motive, such as eliminating competition. See, e.g., United Mine Workers v Pennington 381 U.S. 657 (1965); Eastern Railroad Presidents Conference v Noerr Motor Freight 365 U.S. 127 (1961).

361 Walker Process Equipment v Food Machinery and Chemical Corp. (1965) 382 US 172.

362 Case T-111/96 ITT Promedia NV v Commission (1998) ECR II-2937.

the plaintiff on a cost-benefit analysis of his economic interest to bring suit.

With regards to the first approach, the existence of a predatory intent is clearly demonstrated in situations of misrepresentations of facts or law to tribunals, perjury, fraud or bribery. However, the courts also consider as sham litigation actions that are manifestly unfounded or without probable cause. In assessing the existence of probable cause the courts examine the situation existing when the action in question was brought. Probable cause to institute civil proceedings requires no more than a reasonable belief that there is a chance that a claim may be held valid upon adjudication. This approach makes virtually conclusive the presumption that a successful suit cannot be a sham. It requires as a first step of the analysis of the claim of sham litigation by the courts, the proof that the lawsuit is objectively baseless, in the sense that no reasonable litigant could realistically expect success on the merits. However, there are important reasons to object to this test. Probable cause may be absent if the claim is not supported by the adequate factual evidence. It is also possible that a claim is considered baseless because of a misconceived interpretation of the law. However, in this some courts may consider baseless an action that other courts will consider meritorious. This risk is particularly present in situations in which the concept of what constitutes a baseless claim may be influenced by the court's conception of the adequate balance to achieve between allocative and dynamic efficiency. The establishment of a bright-line rule may lead to an important risk of false negatives. Furthermore, it might not be objectively reasonable to bring a lawsuit just because there is a probability of some success on the merits, no matter how insignificant the value of the claim might be.

The second approach is broader. The fact that the claim is not baseless does not preclude the finding that the use of litigation constitutes an antitrust violation. Rather, the existence of sham litigation is evaluated by a purely objective test focusing on the economic interest of the plaintiff to bring legal action. What counts is whether the suit's expected value to the plaintiff exceeds its costs. The economic test for sham litigation is essentially a predation test, as it requires the proof of a profit sacrifice, which cannot be recouped by the plaintiff at a later stage in the event his legal action is successful. The application of this test raises numerous questions. For instance, information with respect to relative legal merits of the opposing parties and the amount of recovery may be privately held. The parties must learn about each other before they can identify suitable settlement terms. This learning is difficult because of incentives to misrepresent private information. Further, economies of scale in legal services may prompt large or dominant firms to follow anticompetitive rent-seeking strategies. As a result, some anticompetitive rent-seeking cases may be wrongly identified as non-predatory. The forgoing leads us to the question as to what is a workable standard for establishing the existence of sham litigation. Unlike the vast literature on predatory pricing, economists have had little to say on the issue of predatory sham litigation. Economic literature has yet to produce an objective examination of the incentives for sham acts.

In US antitrust law, the Supreme Court has adopted a two parts test, combining an objective with a subjective approach: (i) the lawsuit must be objectively baseless, no reasonable litigant could realistically expect success on the merits; (ii) only if the challenged litigation is objectively meritless may a court examine the litigant's subjective motivation (his bad faith).[363] Thus, motive alone cannot make viable a Section 2 Sherman Act case for infringement or misappropriation of intellectual property simply because the IPR turns out to be invalid.[364] Similarly, because of the additional subjective requirement, objective baselessness alone, although necessary, is not by itself a sufficient element of a competition law claim.[365] It is not sufficient that the underlying claim is objectively baseless; the claimant (in the IP infringement case) must know or believe that it is. In EU competition law, the General Court found that bringing legal proceedings may constitute an abuse only in "exceptional circumstances", namely (i) where the action cannot reasonably be considered as an attempt to establish the rights of the undertaking concerned and would therefore serve only to "harass" the opposite party and (ii) the action is part of a plan whose aim is to eliminate competition.[366] This test seems to be more geared towards the intent of the claimant than the US antitrust two parts test, yet focusing on an objective definition of that intent by inferring it from the absence of any other plausible explanation for the claim than a harassment strategy of the other party.

The application of these criteria in practice presents a number of difficulties, in particular with regard to the complex patent environment in certain industries (e.g. pharma). In the context of this industry, litigation almost always raises disputes on seemingly genuine or reasonable issues about infringement, sometimes involving secondary patents filed by the originator some years after the grant of a primary or base patent raising material issues as to the scope of the patent and the ability of the generic firms to invent around the claimed patent.[367] Patent litigation in this area is also initiated in an important proportion by generics firms seeking declarations of non-infringement or declarations of invalidity, thus breaking with the "mould" envisaged by the test.[368] It has also been noted that a dominant undertaking initiating the IP litigation would be required to show, as a defence to the antitrust counterclaim, that it believed at the time of initiating this litigation that it had good prospects of success, by disclosing privileged information the undertaking received from its counsel on the success of the litigation or internal documents on the perceived value of patent or IPR.[369]

363 Professional Real Estate Investors, Inc v Columbia Pictures Indus., Inc, 508 U.S. 49 (1993).

364 Ibid para 66.

365 Ibid para 61–62.

366 Case T-111/96, ITT Promedia NV v Commission (1998) ECR II-2937, paras 55 and 57.

367 Simon Priddis and Simon Constantine, 'The Pharmaceutical Sector, Intellectual Property Rights, and Competition Law in Europe' in S. Anderman & A. Ezrachi (eds.), Intellectual Property and Competition Law (n 167) 241–275, 267.

368 Ibid

369 Ibid 268.

SUMMARY. This area of interaction between competition law and IPRs still remains largely unexplored and involves some difficult compromises, as access to justice should be preserved, while competition in the marketplace preserved. The recent enforcement activity of the European Commission might offer an occasion to address some of the complex evidential challenges in this area of competition law.[370]

2. The "Innovation Commons"[371]

In some key industries, such as semi-conductors, computer software, biotechnology, nanotechnology, electronics, amongst others, the fuzzy boundaries of individual IPRs, the development of complex products requiring a variety of inputs and complementary assets, the importance of litigation following up disputes over appropriability and the need to organize the sharing of benefits between the actors present at different stages of the innovation process, has led to the development of "innovation commons", enabling the sharing of information protected by IPRs and avoiding the problem of blocking patents. When licenses from too many individual IP holders are required, firms might under invest in the commercialization of downstream technologies, thus impeding R&D activity by making it difficult for firms to operate without extensive licensing of complementary technologies. The fragmentation of IPRs may impede the development and commercialization of new products or may increase considerably their cost. Focusing on the biotechnology industry, Heller and Eisenberg have discussed the "tragedy of the anti-commons" that may arise when there are multiple gatekeepers, each of whom must grant permission before a resource can be used: when IPRs are fragmented, the resource is likely to be underused and thus innovation will be stifled.[372] There is empirical evidence of this "anti-commons" problem and the resulting fragmentation of IPRs in various industries. For example, Hall and Ziedonis have examined patenting in the semi-conductor industry and found that this was higher in the presence of a low concentration of patent rights among rival firms, that is, a situation of greater fragmentation of patent rights. These empirical studies indicate that firms attempt to defend themselves from the anti-commons problem by developing strategies of defensive patenting in order to strengthen their bargaining position, thus at the same time increasing the likelihood of a "tragedy of anti-commons".[373]

Innovation commons may take different forms: those working within the framework of IPRs include patent pools and cross-licensing arrangements, blanket licensing, cooperative standard setting and settlement of IP related disputes. The management of common resources provides benefits in comparison to the organization of the activity within a firm, as it enables the public to benefit from communal development, but also competition. In certain circumstances it can be a superior alternative than individual IPRs, dealing with the problem of "excessive or misaligned" IPRs and the constitution of "patent thickets". Patent thickets are particularly common in technology areas that are densely populated by patents having overlapping claims relating to similar technology.[374] This overlapping set of patent rights requires that those seeking to commercialise new technology obtain licenses from multiple patentees. This leads first to increased transaction costs associated with negotiating with multiple patent owners if a license is needed to avoid infringement. Second, producers may infringe patents inadvertently, because it is difficult to identify overlapping patents or because the patent boundaries are hard to determine prior development of the invention. Third, inventors may face potential litigation from upstream firms that do not practice their patents and hence keep them in relative obscurity, thus increasing litigation costs. Fourth, when multiple patents cover complementary components of a technology, patentees may exclude each other from using the technology as produce will have to navigate a "thicket" of conflicting rights to use their invention. The risk of exclusion may be intensified if patent holders strategically engage in building thickets of patents in order to force innovators to share rents under cross licenses or to develop a patent portfolio for defensive purposes. Small and medium enterprises (SME) may also be at disadvantage than large incumbents disposing of strong patent portfolios, which may conclude between them cross-licensing arrangements excluding SMEs from entering markets.

Patent thickets may produce negative welfare effects. It is well known in economics that when firms with market power sell complementary goods, their combined price will typically be higher than if both were sold by a single monopolist. This phenomenon called double marginalization may be particularly acute in high technology fields. In high-tech fields where innovation is rapid and cumulative, a large number of patents may touch on the same new technology. Double marginalization can make the technology expensive to commercialize, harming downstream producers and consumers as well as the innovators the patent system was designed to reward. This complements problem may even become worse if the downstream firms using the various inputs truly require the IPRs controlled by the upstream firm to make their products. First, the downstream producer will have to pay royalties to multiple patent owners, leading to the increase of the total amount of royalties paid, leading to high royalty overcharges that act as a tax on new products incorporating the patented technology, thereby impeding rather than promoting innovation (royalty stacking).[375] This issue is examined in more detail in a different part of the report. Second, it would have

370 See, for instance the recent European Commission's investigation of the patent infringement claims of Laboratoires Servier against Apotex. European Commission Press Release, MEMO/09/322, available at <http://europa.eu/rapid/press-release_MEMO-09–322_en.htm> accessed 28 April 2013.

371 Christina Bohannan and Herbert Hovenkamp, *Creation Without Restraint: Promoting Liberty and Rivalry in Innovation* (Oxford University Press 2012) 325.

372 Michael A Heller and Rebecca S Eisenberg, 'Can Patents Deter Innovations? The Anticommons in Biomedical Research' (1989) 280 Science 1.

373 Bronwyn H Hall and Rosemarie H Ziedonis, 'The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979–1995' (2001) 32 (1) Rand Journal of Economics 101.

374 Review of Intellectual Property and Growth, Patent Thickets, Licensing and Standards, available at <http://www.ipo.gov.uk/ipreview-doc-as.pdf>, accessed 28 April 2013.

375 Mark A. Lemley & Carl Shapiro, 'Patent Holdup and Royalty Stacking' (2007) 85 Texas Law Review 1991, 1993.

been possible for the downstream producer to invent around the blocking patents if that manufacturer were aware of the patent and disposed of the time to do so. However, the situation is different if the downstream producer becomes aware of the patent after the downstream product has been designed and placed into large-scale production. In this case, the manufacturer would have incurred asset specific investments for the use of the specific technology and would be in a far weaker negotiating position. The patent holder could thus seek far greater royalties, backed up with the threat that she may interrupt the productive activity of the manufacturer. The producer's only options in this case would be either to negotiate in a weak bargaining position with the patent holder or go back and redesign the product, re-launch its production, solve any compatibility problems there might exist between the different versions of the product, activities that would impose a huge cost. Consequently, the downstream producer is highly susceptible to hold up by the patent holder (the hold-up problem). Hold out can also arise if the downstream producer needs multiple complementary IPRs which are procured in a sequenced fashion, but patent holders strategically delay the start of the negotiation and thus get the greatest surplus because of the increased bargaining power that would result from their position as the last bidding seller.[376]

A possible solution to the double marginalization problem is the vertical integration of the companies controlling complementary assets. Such a solution may however decrease competition more than what is necessary for the resolution of the problem and might be less optimal than a solution that enables firms to cooperate while maintaining some degree of competition between them. Alternatively, the undertakings controlling these assets may coordinate their activities in a cooperative setting that would enable them to deal with the complements and the hold-up problems by cross-licensing their IPRs. Any cooperation and cross-licensing would be superior to a world in which patent holders fail to cooperate. Such cooperation may however face obstacles with regard to competition law's sensitivity to the cooperation of undertakings that might be potential competitors in different circumstances. As a matter of public policy, coordination will certainly generate benefits to the parties, but one cannot assume that it will always be compatible with the public interest to promote competition and protect the consumers. We will examine the application of competition law in Europe and the US to the various coordination mechanisms put in place in order to deal with the complements and the hold-up problems.

376 Robert P Merges, 'Contracting into Liability Rules: Intellectual property Rights and Collective Rights Organizations' (1996) 84 California Law Review 1293.

a. Patent pools and cross licensing

Patent pools and cross-licensing arrangements constitute a natural solution to the complements problem.[377] Under a patent pool, an entire group of patents is licensed in a package, either by one of the patent holders or by a new entity established for this purpose, offering a "one stop shop" to all members of the pool to have access to the desired patents. Patent pools also enable non-members to have access to the patented technology at a royalty rate established by the members of the pool. Patent pools go back a long time and in some cases their creation was initiated by the State.[378] In 1917, during the First World War, US aircraft manufacturers were asked by the US government to participate to a patent pool because ongoing litigation between the company established by the Wright brothers had led aircraft production to a stalemate.[379] Patent pools are often developed in conjunction with technological standards (e.g., the MPEG-2 video and DVD standards in the late 1990s).

When patents in a pool are complements, the pool can lower their combined price, reduce transaction costs by limiting the number of individual licensing agreements required to make use of the technology) and thus increase licensing revenues. Pools may also reduce costs by reducing the occurrence of infringement litigation. Patent pools may however also be used to eliminate competition between rival technologies and facilitate cartelization. Participants in a patent pool might be able to use it as an opportunity to exchange competitively sensitive information on prices, output, marketing strategies etc. While recognizing the benefits of patent pools, competition authorities at both sides of the Atlantic have subjected patent pools to competition law scrutiny, in particular with regard to their formation, the selection of the included technologies and their operation.

With regard to cross-licensing, the US Guidelines consider that when cross-licensing allows firms to combine complementary factors of production, such licensing can be pre-competitive.[380] The Agencies apply a rule of reason analysis to all cross-licensing arrangements, inquiring whether the restraint harms competition among entities that would have been actual or likely competitors in the absence of the license and whether the restraint is reasonably necessary to achieve precompetitive benefits that outweigh anticompetitive effects.[381] However, they take a different perspective when cross-licensing constitutes a method for collusion on price

377 Cross-licensing arrangements take the form of bilateral agreements under which two firms license large blocks of their respective patents to one another so as to avoid infringement litigation. That removes the need of patent-by-patent licensing and reduces transaction costs. Patent pools intervene in situations in which a firm requires licenses to a small number of patents held by each of many firms.

378 On the first patent pool, see, Adam Mossof, 'The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s' (2011) 53 Arizona Law Review 165.

379 For an analysis of the emergence of patent pools, see Robert Merges, 'Institutions for Intellectual Property Exchange: The Case of Patent Pools', in (Rochelle Dreyfuss, ed.) *Intellectual Products: Novel Claims to Protection and Their Boundaries* (Oxford Univ. Press, 2011) 123.

380 DOJ and FTC Guidelines (n 220) §2.3.

381 Ibid §3.1.

or output by downstream competitors: arrangements determined to be mechanisms of naked price fixing or market division are analyzed under the per se prohibition rule.[382] The Agencies consider that anticompetitive exclusion because of a cross-licensing arrangement is unlikely unless the parties to the arrangement collectively possess market power.[383] The Guidelines' market share threshold and the number of technologies safe harbors apply in this context.

With regard to patent pools, both the US Licensing arrangements guidelines and the EU Transfer of Technology Guidelines distinguish between complement and substitute technologies. Two technologies are complements when they are both needed for the production of the product or for carrying out the process to which the technologies relate. Two technologies are substitute when either technology enables the downstream manufacturer to produce the product or carry out the process to which the technologies relate. Pools composed of pure substitute technologies are more likely to harm competition and social welfare than are pools of complementary technologies. A further distinction is made between essential and non-essential technologies. Pools which are only composed of essential technologies are always precompetitive. All essential technologies are by definition considered complementary as well. Pools with complementary non-essential technologies may raise some competition concerns and there should be pro-competitive reasons to include non-essential technologies to the pool. The US Agencies apply a rule of reason analysis to patent pools, with the exception of when the pool is a naked restraint to competition. Patent pools limiting competition among entities that would have been actual or likely potential competitors in a relevant market in the absence of the license have the greatest potential to restrict unreasonably competition. Vertical license restrictions may also harm competition if they foreclose access or raise the price of an important input or if they facilitate horizontal coordination. The US Agencies have completed their policy analysis of patent pools in the Guidelines with a number of favorable business review letters issued by the Department of Justice regarding an MPEG patent pool, two DVD patent pools and a patent platform arrangement involving five separate wireless communication 3G technologies. The FTC has also initiated some enforcement action against patent pool formed by Summit Technologies, Inc and VisX, INC, two firms present in the manufacture and marketing of lasers for vision correcting eye surgery. The FTC examined if the two alleged efficiencies of the patent pool could have been achieved by significantly less restrictive means and the patent pool was dissolved following a settlement with the FTC.[384]

Categorizing technologies as being complements or substitutes is not an easy task as in some cases technologies may display characteristics of both. There is also some discussion over the essential or non-essential character of the technology, as different tests to define whether the patent is essential to a standard or technology have been put forward.[385] Recent patent pools have all been limited to essential patents and provide for independent experts to determine which patents should be included on this basis as a competitive safeguard to ensure that patent pools will not produce any anticompetitive effects.

The EU Transfer of Technology Guidelines adopts a similar approach.[386] Patent pools composed of essential technologies do not fall within the scope of Article 101 (1) TFEU. The inclusion of substitute technologies brings the patent pools within the prohibition principle of Article 101 (1) and it is highly unlikely that it will benefit from the legal exception of article 101 (3) TFEU, at least not if the substitute technologies constitute a significant part of the pooled technology, even if parties remain free to grant individual licenses, as this is unlikely to occur. If complementary patents of a non-essential nature are included, article 101 (1) becomes applicable because of collective bundling, yet article 101 (3) may apply if the nature of the pooled technology is ambivalent (complementary in part, substitute in part) or it changed over time (from essential to non-essential). Market dominating pools are required to practice fair and non-discriminatory terms of licensing and they may not grant exclusive licenses.[387] The EU Guidelines on transfer of technology also contain detailed analysis on the institutional framework governing the pool, noting that "(t)he way in which a technology pool is created, organized and operated can reduce the risk of it having the object or effect of restricting competition".[388] Open pools are considered more competition-compatible than pools set up by a limited group of technology owners. The involvement of independent experts to the creation and operation of the pool and for the consideration of whether or not a technology is essential also reduce the likelihood of the pool being found anticompetitive. The likelihood of sensitive information being exchanged in an oligopolistic setting and the competitive safeguards put in place to avoid this from happening are also examined by the Commission.

SUMMARY. Both US antitrust and EU competition law have adopted a flexible approach to patent pools and cross-licensing, thus facilitating the resolution of the complements and hold up problems that may arise in situation of patent thickets.

b. Standard setting and other forms of technology sharing

Standard setting may take different forms: technical standards may be the consequence of regulatory intervention, cooperative standards may be established through voluntary

382 Ibid §3.4.

383 Ibid §5.5.

384 US DOJ and FTC, 'Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition' (April 2007) available at <http://www.ftc.gov/reports/innovation/P040101PromotingInnovationandCompetitionrpt0704.pdf> last accessed 28 April 2013, pp. 64-86.

385 One could distinguish between an "economic" test and a "technically essential" test.

386 As technology pools include more than two parties, the Block exemption Regulation 772/2004 on transfer of technology agreements does not apply. However, the Commission provides information on the analytical framework in its Guidelines on transfer of technology agreements.

387 Ibid para 226.

388 Ibid para 230–235.

standard setting organizations or de facto standards set by the market place may emerge following an intense competition between firms engaged in a winner-take-all standards war. One might think of Microsoft's Window operating system or the QWERTY keyboard layout as illustrations of the emergence of the latest type of standard, the firm's position as market leader enabling it to select the standard (protected by IPRs) and force rivals to obtain a license. Standards provide increased compatibility between different products, increased interoperability, thus enabling the launch of a network. The role of interface standards is particularly significant in communication technologies, such as cell phones, personal digital assistants, laptops. A standard implemented before the development of a patent thicket may alleviate some of the complements and hold up concerns related to patent thickets. At the same time, standardization may impose costs, as it locks in consumers to a legacy system, enables hold up in cases essential IPRs have not been declared prior the standard or may enable dominance by big players. The way the industry standard emerges is of particular importance in order to assess its effects on competition. A cooperative standard is likely to enable multiple firms to be active in the industry, while the development of a *de facto* standard may lead to a single, proprietary product, controlled by a dominant firm.

Cooperative standard setting involves collaboration between competitors in the context of a Standard Setting Organization (SSO). SSOs adopt IP-related rules so as to promote cooperation and the development of standards: disclosure rules require participants to the SSO to inform the SSO members of any IP rights they held on technologies; SSOs are also based on transparency rules enabling members to be kept informed of ongoing and finalized standardization work. Licensing rules ensure that all members have effective access to the standard on fair, reasonable and non-discriminatory terms ((F)RAND). As these rules engage actual or potential competitors, they may infringe, in certain circumstances, the provisions of Section 1 Sherman Act in US antitrust law or Article 101 TFEU in EU competition law.

In US law, antitrust liability has been found for participants in a standard setting process abusing of this process in order to exclude competitors from the market.[389] Although, according to the Supreme Court, "an agreement on a product standard is, after all, implicitly an agreement not to manufacture, distribute, or purchase certain types of products," US antitrust law has stayed clear from cooperative efforts that aim to set standards as long as the scope of the agreement is limited to standard setting and does not extend to distribution or pricing. Integration and risk sharing, even among competitors, has traditionally been classified as a joint venture agreement under US antitrust law, thus escaping per se prohibition.[390] In the context of a standard setting organization, the aim of the agreement is not however to share risks but to mitigate a hold up situation, limiting the likelihood that blocking patents may jeopardize the development of a new technology.

The ex-ante negotiation of licensing terms by SSO participants may enter the radar of competition authorities, as competing firms will be acting jointly to negotiate licensing terms with each of the firms whose technology may be considered for inclusion on the SSO's standard. Sham negotiations "intended to cloak the true nature of a particular licensing agreement", are subject to the per se prohibition rule.[391] For example, any effort by the SSO members to negotiate a price fixing agreement will be per se illegal. Conduct such as multilateral ex ante licensing negotiations or SSO requirements for intellectual property holders to disclose their intended licensing terms for technologies being considered for adoption in a standard, taking place before any decision is reached on which technology to include in a standard, will however be examined under the rule of reason standard.[392]

A series of cases has brought to the attention of competition authorities in the US deceptive conduct by a participant in the context of a SSO. In re Dell, the FTC examined deceptive conduct by Dell, which had omitted to disclose the IPRs held by Dell, prior to the adoption of a standard by the Video Electronics Standards Association. Once this standard has been adopted, Dell informed all the other participants that their implementation of the standard violated its exclusive right. The FTC entered into a consent agreement impeding Dell from using the patent against those implementing the standard.[393] In Unocal, the Union Oil Company of California had also deceptively declared in the context of the SSO's rulemaking proceedings prior to the adoption of the standard that it had no proprietary rights on technologies included in the standard, before claiming once the technology has been implemented and other oil refiners had modified their refineries to comply with the standard the infringement of its patents and the collection of royalties. The FTC successfully challenged this practice and Unocal agreed to settle in not enforcing the patents relating to the standards.[394] As some of these cases are related to (F)RAND terms related litigation, we will examine this further in the following section.

Turning to Europe, the recently adopted Guidelines on the applicability of Article 101 TFEU on horizontal cooperation agreements contain detailed guidance on standardization agreements.[395] The Commission examines the effect of the standard-setting process on different markets: (i) the product or the service market to which the standard relates, (ii) if the standard setting involves the selection of technology and

389 Allied Tube & Conduit Corp. V Indian Head, Inc., 486 US 492 (1988) (noting that "private standard-setting associations have traditionally been objects of antitrust scrutiny" because of their potential use as a means for anticompetitive agreements among competitors); American Society of mechanical Engineers v Hydrolevel Corp., 456 US 556 (1982).

390 See, our analysis below III.C.2.e.

391 DOJ and FTC Guidelines on licensing arrangements (n 220) §3.4., example 7.

392 See, US DOJ and FTC, 'Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition' (April 2007) available at <http://www.ftc.gov/reports/innovation/P040101PromotingInnovationandCompetitionrpt0704.pdf > last accessed 28 April 2013, pp. 33–56

393 Re Dell, 121 FTC 616 (1996).

394 Re Union Oil Co. of California, 2004 FTC LEXIS 115 (July 7, 2004); See also, re Rambus, Inc., Dkt. No. 9302, 2006 FTC LEXIS 101 (Aug. 20, 2006), which will be discussed further below.

395 Communication from the Commission – Guidelines on the applicability of Article 101 TFEU to horizontal co-operation agreements, [2011] C 11/1, Part 7.

the rights to IP are marketed separately from the products to which they relate, the impact on the relevant technology market, (iii) on the market for standard-setting, if different standard-setting arrangements exist, (iv) on a distinct market for testing and certification that may be affected by the standard-setting.[396] The Commission recognizes that standardization may produce significant positive effects as it encourages the development of new and improved products or markets, but in certain circumstances they might restrict price competition and limit to control production and the level of innovation and technical development, in particular by facilitating collusion or by excluding innovative technologies and foreclosing the market. The analysis is even more complicated in the context of standard-setting involving IPRs as there are multiple actors involved: (i) Companies that are only operating upstream and do not engage in manufacturing. These "non-practising entities" may hold patents essential to a standard, their only source of income being licensing. (ii) Downstream-only companies are solely present at the manufacturing level and do not hold IPRs, their production being based on technologies developed by others. (iii) Finally, vertically integrated companies that both develop technologies and sell products. In negotiations between non-practising entities and vertically integrated companies, the former ones have the upper hand, as the vertically integrated companies may not offer to cross-license their own IPRs. This can lead to situations of patent abuse and excessive royalties, as we will examine further in the report.

The possible anticompetitive effects notwithstanding, the Commission recognizes that there is no presumption that holding or exercising IPRs essential to a standard equates to the possession or exercise of market power. Effects on competition are assessed on a case-by-case basis. As it is also the case with US antitrust authorities, the Commission considers that using the disclosure rules of the SSO prior to the adoption of the standard to cover jointly fixed prices of either downstream products or of substitute technologies constitutes a restriction of competition by object under Article 101 (1). All other arrangements may not be subject to Article 101 (1), unless there are demonstrable anticompetitive effects. According to the Commission, "(w)here participation in standard-setting is unrestricted and the procedure for adopting the standard in question is transparent, standardization agreements which contain no obligation to comply with the standard and provide access to the standard on fair, reasonable and non-discriminatory terms will normally not restrict competition within the meaning of Article 101 (1)".[397] The Commission acknowledges the need for the SSO to have transparent participation rules and procedures,[398] good faith disclosure rules[399] and notes that the SSO's IPR policy "would need to require participants to have their IPR included in the standard to provide an irrevocable commitment in writing to offer to license their essential IPR to all third parties on fair, reasonable and non-discriminatory terms ("(F)RAND commitment")" that "should be given prior to the adoption of the standard".[400] Furthermore, any exclusion by the participants of specified technology from the commitment to offer to license should be done at an early stage of the development of the standard. If participation to the standard-setting process is open equal access is ensured, allowing all competitors and/or stakeholders in the market affected by the standard to take part in choosing and elaborating a standard, the risks of a likely restrictive effect on competition will be low.[401] Similarly, competition between many SSOs or standard-setting processes in the industry will exclude the likelihood of the finding of anticompetitive effects. As it is clearly indicated by the Commission, the analysis should focus on the effects on the market and for this reason the market shares of the goods or services based on the standard will be taken into account.[402] Usually market shares of more than 20% may lead to a more intense scrutiny of the SSO's arrangements. In the worst-case scenario, if anticompetitive effects are identified, article 101 (3) may come into play. The Commission recognizes that standardization frequently gives rise to significant efficiency gains. With regard to the pass-on to consumers requirement of Article 101 (3), the analysis will focus on "which procedures are used to guarantee that the interests of the users of standards and end consumers are protected", the Commission noting that "(w)here standards facilitate technical interoperability and compatibility of competition between new and already existing products, services and processes, it can be presumed that the standard will benefit consumers".[403] Presumptions may thus avoid a quite difficult and complex examination of the trade-off between allocative and dynamic efficiency in this context. When, however, standard-setting leads to a de facto industry standard, Article 101 (3) may not enter into play if affords the parties the possibility to substantially eliminating competition.[404]

SUMMARY. Both US antitrust law and EU competition law offer a high degree of flexibility to voluntary standard-setting processes as long as basic rules of transparency, good faith disclosure, or a requirement to commit to license on (F)RAND terms are implemented.

c. (F)RAND licensing obligations

As we have previously explained, once a standard is adopted, it is impossible to manufacture products compliant with the standard without infringing the IPRs covering that standard. Hence, once a patented technology is incorporated as an essential part of a standard, the industry gets locked in this standard as switching to an alternative technology may be particularly costly. The holder of a standard essential patent is able to seek a court injunction to block companies from producing any products compliant with the standard and to ask for higher royalties than what he would have asked prior to the adoption of the standard. The infringers would have in

396 Ibid para 261.
397 Ibid para 280.
398 Ibid para 280 & 282.
399 Ibid para 286.
400 Ibid para 285.
401 Ibid para 295.
402 Ibid para 296.
403 Ibid para 321 (emphasis added).
404 Ibid para 324.

this case to remove their infringing products from the market and no other choice than to accept licensing terms that they would not have accepted otherwise (a hold up situation). The issue may arise even if the standard essential patent holders have made a commitment to license in (F)RAND terms.[405] An often related issue is what constitutes (F)RAND. This is an issue we will examine in more detail when analyzing the application of competition law to pricing conduct. However, even in presence of (F)RAND licensing the level of royalties required may be higher than otherwise would be the case, in particular if the standard essential patents (SEP) are owned by upstream companies that are not active in both R&D and the supply of products or services (the so called "non-practising entities"). These may sometimes contribute to the R&D effort upstream (e.g. universities and companies actively investing in R&D but choosing a licensing IPRs business model) but also "patent trolls", companies that do not contribute to R&D and product development but instead purchasing companies with large patent portfolios, then waiting until an industry is locked into a SEP they own and then taxing the industry participants with substantial royalty demands. The risk of hold up is particularly important in complex technically markets in which detailed standards have been developed cooperatively by many companies. As it was explained below, non-practising entities are not constrained by the need to guarantee cross-licensing arrangements, as most vertically integrated companies active in the supply of goods and services do: they can ask for injunctive relief against other companies knowing that they are not exposed to the risk of being subject to similar actions. For similar reasons they do not fear that SSOs may be reluctant to accept in the future their technologies, as they are not active inventors in the specific industry. Hence, in a case opposing NTP, a non-practising entity holding SEP in wireless email technology and Research In Motion (RIM), the manufacturer of blackberry, NTP's threat of an injunction ceasing the operation of all Blackberry services by RIM led the later to agree to settle for a sum of $612,5 million.

Since the eBay judgment of the US Supreme Court, it is much more difficult for non-practising entities to obtain injunctions in patent infringement cases. However, in Europe, such constraints in the use of permanent injunctions do not exist yet and although damages are less significant, the availability of injunctive relief may enhance the bargaining power of non-practising entities and ensure high rents from settlements.

Both US antitrust and EU competition law have touched upon conduct relating to (F)RAND licensing and standard essential patents. We have already examined below the enforcement of Section 1 Sherman Act and Article 101 TFEU. It is clear from the EU Guidelines on horizontal cooperation agreements that patents declared essential to a standard must be made available on all interested parties in (F)RAND terms.[406] Unilateral conduct may also fall within the scope of competition law, most usually Article 102 TFEU in Europe and Section 5 of the FTC Act in the US. As it has been recognized by the European Commission, "abuse of the market power gained by virtue of IPRs included in the standard constitutes an infringement of Article 102 TFEU".[407]

Some of the examined conduct relates to the transferability of the (F)RAND commitment from the companies engaged in the standard-setting process to the non-practising entities that acquired these patents, following a merger and acquisition process or other transaction. In N-Data, Negotiated Data Solutions, a non-practising entity obtained certain patents essential to an Ethernet standard developed by the IEEE. N-Data's predecessor had committed to license its technology for a one off fee of $1000 per license, as a result of which the technology was included in the standard and the industry committed to the standard. Although N-Data had made the acquisition in full knowledge of this commitment of the previous owner, it demanded royalties far in excess of $1000 per license. The FTC alleged that N-Data's conduct was an unfair practice under Section 5 of the FTC Act harming consumers and N-Data agreed to a consent order, which required it to change its licensing terms so as to bring them in conformity with the commitment of the original patent holder.[408] It is noteworthy that the broad interpretation of Section 5 of the FTC Act in this case may be considered as limited by the requirements that (i) the conduct is coercive or oppressive (here it was assumed that the patent hold-up was inherently "coercive" and "oppressive" with respect to firms that are, as a practical matter, locked into a standard) (ii) there is an adverse effect on competition (here the alleged effect was on prices and the integrity of the standard setting-process); and (iii) the injured parties are unable to defend themselves.[409]

The European Commission has also taken position as to the transferability of the (F)RAND commitment in its Horizontal Cooperation Guidelines providing that "to ensure the effectiveness of the (F)RAND commitment there would also need to be requirement of all participating IPR holders who provide such a commitment to ensure that any company to which the IPR owner transfers its IPR (including the right to license that IPR) is bound by that commitment, for example through a contractual clause between buyer and seller."[410]

The litigation strategies employed in the context of SEP have also been examined in the two recent investigations in the US and in Europe. In the US, the FTC has recently conclud-

405 In Europe, the term Fair and Reasonable Non-Discriminatory Prices is used. In the US, the term RAND (Reasonable and Non Discriminatory terms) is preferred, as US antitrust law does not deal with exploitative practices and hence "fair" prices. See our analysis below.

406 Communication from the Commission – Guidelines on the applicability of Article 101 TFEU to horizontal co-operation agreements (n 382) paras 282–283.

407 Ibid para 284.

408 In re Negotiated Data Solutions LLC, FTC File No. 051–0094, Decision and Order (Jan. 23, 2008), available at <http://www.ftc.gov/os/caselist/0510094/080122do.pdf> (note the dissenting statements of Deborah Platt Majoras and Bill Kovacic; see also, In re Robert Bosch GmbH, FTC File N. 121–0081, Decision and Order (Nov. 26, 2012), available at <http://www.ftc.gov/os/caselist/1210081/121126boschdo.pdf> accessed 29 April 2013.

409 See, Analysis of Proposed Consent Order To Aid Public Comment at 4–6, In re Negotiated Data Solutions LLC, File No. 0510094 (Jan. 23, 2008), available at <http://www.ftc.gov/os/caselist/0510094/080122analysis.pdf> accessed 29 April 2013.

410 Communication from the Commission – Guidelines on the applicability of Article 101 TFEU to horizontal co-operation agreements (n 382) para. 285.

ed a settlement with Google with regard to the conduct of Google's subsidiary Motorola to renege on its licensing commitment before its acquisition by Google made to several standard-setting bodies to license its SEP relating to smartphones, tablet computers and video game systems on RAND terms by seeking injunctions against willing licensees of those SEPs. Google had acquired Motorola Mobility (MMI) in 2012 including MMI's patent portfolio of over 24000 patents and patent applications with a number of patents essential to industry standards used to provide wireless connectivity and for internet-related technologies (e.g. smartphones, gaming systems, operating systems, devices offering wireless connectivity or high definition video). The FTC found that the conduct tended to affect competition in these electronic devices markets and was in violation to Section 5 of the FTC Act. FTC's settlement requires Google to withdraw its claims for injunctive relief on RAND-encumbered SEP's around the world in the future. According to the FTC, the proposed settlement "may set a template for the resolution of SEP licensing disputes across many industries and reduce the costly and inefficient need for companies to amass patents for purely defensive purpose in industries where standard-compliant products are the norm".[411]

In Europe, the Commission approved the merger between Google and Motorola in 2012. In response to Google's argument that the new entity would not have the ability to significantly impede effective competition post-merger, as it will be constrained by the (F)RAND commitment which has been given by Motorola Mobility, the Commission noted that (F)RAND commitments "cannot be considered as a guarantee that a SEP holder will not abuse its market power".[412] According to the Commission, a SEP holder can certainly threaten to seek or seek injunctions at any time and nothing ensures that a national court in question may grant an injunction without a detailed examination of whether (F)RAND and Article 102 TFEU have been respected, leaving the SEP holder free to enforce the injunction.[413] The Commission noted that "the threat of injunction, the seeking of an injunction or indeed the actual enforcement of an injunction granted against a good faith potential licensee, may significantly impede effective competition by, for example, forcing the potential licensee into agreeing to potentially onerous licensing terms which it would otherwise not have agreed to".[414] Commenting on this decision, Damien Geradin argues that "the Commission takes a prudent position" as "while it does not suggest that patent holders who have made a (F)RAND commitment should always be prohibited from seeking injunctions (which would be an excessive position), it recognizes that there may be circumstances where the seeking of an injunction may be abusive, especially when such injunctions are used to coerce "good faith" licensees to accept licensing terms that it would not accept but for the injunction".[415] The approach followed by the Commission raises the issue of identifying what makes someone a "willing" (good faith) licensee, an issue that was also raised in the US cases.

The Commission has recently opened investigations against two SEP holders active in the mobile device industry (Samsung Electronics and Google MMI) alleging that by seeking and enforcing injunctions in various Member States' courts against competing manufacturers based on alleged infringement of certain SEPs, the companies have failed to honor their irrevocable commitments to license any SEP on (F)RAND terms, that behavior being an abuse of a dominant position.[416] These cases may offer the European Commission the opportunity to elucidate its position with regard to the availability of injunctive relief for SEP holders in the case of willing licensees and provide a more detailed definition of the latter category.

SUMMARY. Competition law authorities in Europe and the US have recently intervened to control behavior adopted in the context of SSOs and in negotiations between standard essential patent holders and potential licensees outside the standard-setting environment. The trend at both sides of the Atlantic is to limit the right of SEP holders to use injunctive relief and reverse commitments to license in (F)RAND terms taken previously by the original SEP holders. The availability of injunctive relief in this context has already been curtailed in the US, with the recent judgment of the Supreme Court in eBay and the recent actions of the FTC in the enforcement of Section 5 of the FTC Act. In Europe, the recent investigations of the European Commission in the enforcement of Article 102 TFEU signal that a similar move will take place.

d. Price fixing and horizontal market restraints

Horizontal price fixing or naked agreements seeking to divide the market or to impose output restrictions between competing intellectual property owners are prohibited by both Section 1 Sherman Act and Article 101 TFEU. Agreements between competitors that restrict licensing or that give to one competitor the right to veto another's strategic licensing decisions as to pricing, output, innovation will likewise be treated as a per se violation of Section 1 of the Sherman Act.[417] In Europe, such restrictions are explicitly excluded from the benefit of the block exemption regulation and it is highly unlikely that they might be justified under Article 101 (3) TFEU.[418]

411 In re Google Inc., FTC File No. 121–0120 (January 3, 3013), available at <http://www.ftc.gov/os/caselist/1210120/130103googlemotorolastmtofcomm.pdf> Statement of the Federal Trade Commission.

412 European Commission, Case No COMP/M.6381, Google/Motorola Mobility (February 13, 2012), available at <http://ec.europa.eu/competition/mergers/cases/decisions/m6381_20120213_20310_2277480_EN.pdf> accessed 29 April 2013.

413 Ibid para 113.

414 Ibid para 107.

415 Damien Geradin, 'Ten Years of DG Competition Effort to Provide Guidance on the Application of Competition Rules to the Licensing of Standard-Essential Patents: Where Do We Stand?' (21 January 2013), available at SSRN: <http://ssrn.com/abstract=2204359> or <http://dx.doi.org/10.2139/ssrn.2204359> accessed 29 April 2013.

416 European Commission, Commission opens proceedings against Samsung, IP/12/89 (January 31, 2012), available http://europa.eu/rapid/press-release_IP-12–89_en.htm; European Commission, Commission opens proceedings against Motorola, IP/12/345 (April 3, 2012), available at <http://europa.eu/rapid/press-release_IP-12–345_en.htm> accessed 29 April 2013/

417 US DOJ and FTC, Guidelines on Licensing arrangements (n 220) §3.4.

418 EU Guidelines on Transfer of Technology Agreements, (n 106) Article 4.

e. Joint ventures

A distinction should be made between horizontal cooperation agreements that constitute joint ventures, which are analyzed under the rule of reason and horizontal price fixing or naked output restrictions that are subject to the principle of per se prohibition.[419] To determine whether a particular restraint in a licensing arrangement is given per se or rule of reason treatment, the US Agencies examine whether the restraint in question can be expected to contribute to an efficiency-enhancing integration of economic activity. Any restraint in a licensing arrangement that may further the combination of the licensor's intellectual property with complementary factors of production owned by the licensee by, for example, aligning the incentives of the licensor and the licensees to promote the development and marketing of the licensed technology, or by substantially reducing transactions costs should be analyzed under a rule of reason standard. For example, price restraints that limit the independent pricing of the members of the joint venture may be subject to a quick look rule of reason approach when they are reasonably necessary in order to achieve the efficiency-enhancing integration of economic activity.[420]

In some cases, restrictions may be necessary in order to achieve important transactional efficiency benefits. A classic example is collecting societies. In BMI the US Supreme Court held that the blanket licenses issued and priced by the music performing rights organizations ASCAP and BMI were not subject to per se prohibition under Section 1 of the Sherman Act because: (i) they allowed for new, integrated products "entirely different from the product that any one composer was able to sell by himself", (ii) they generated substantial transaction-cost savings and (iii) they were a practical necessity if songwriters were to be paid for the use of their compositions.[421] The BMI approach enables horizontal cooperation arrangements that bring substantial efficiency gains to escape prohibition. EU Competition law is also relatively lenient to cooperative joint ventures for production or sales with efficiency gains.[422] The EU Courts have also recognized the important transactional benefits of collecting societies,[423] although there is recently some skepticism over the indispensability of the restrictions of competition inherent in a collecting society, as individual exploitation using digital rights management systems (DRMs) may technically replace collective administration through collecting societies.[424]

SUMMARY. Joint ventures may escape prohibition in both US and EU competition law when they allow for efficiency-enhancing integration of assets, in the absence of a naked or hardcore restriction to competition (e.g. cartels).

3. Tying and Interoperability

Bundling may take different forms: pure bundling, tying arrangements where some of the goods contained in the package are offered on their own (tied product) whereas others are not available individually (tying products), or mixed bundling, which refers to the practice of selling each product as part of a package, as well as individually but to be interesting for consumers the bundle price must be lower than the sum of individual prices. In EU competition law tying arrangements may fall under Articles 101 and 102 TFEU. In US antitrust law they may be analyzed under Section 1 and 2 of the Sherman Act, Section 3 of the Clayton Act or Section 5 of the FTC Act. In addition, tying may establish a basis for a copyright or patent misuse claim. Intellectual property tying claims may take different forms: (i) the tying of a patented device with an unpatented component or when the licensing of one technology is conditional upon the licensee purchasing a product, (ii) technological tying resulting from product design changes with the aim to combine functionalities between a patented product with an unpatented one, (iii) bundled or package licensing which bundles an unwanted IPR to another IPR that the licensee desires, the classic example being block booking of motion pictures, (iv) the bundling of licensing a specific IPR with franchising. We will focus on patent ties, technological tying and package licensing.

a. Patent ties

Tying is a relatively frequent claim related to IP licensing and has been particularly important for the development of the interaction between competition law and IP rights, the first antitrust cases dealing with IP rights involving tying claims of patented with unpatented goods and raising the question of the extent of the right of the IP owner to exploit its IPR. Following the Supreme Court's judgment in Jefferson Parish Hospital, tying was subject to a peculiar quasi-per se illegality analysis, as the plaintiffs were required to meet four elements to prove a violation of Section 1, among which (i) the existence of two separate products, (ii) evidence of coercion and (iii) proof that the seller has sufficient economic power in the market for the tying product to enable it to restrain trade in the market for the tied product (a market share of less than 30% in the tying product market was considered insufficient to establish market power).[425] In Illinois Tool Works, the Supreme Court acknowledged that "this Court's strong disapproval of tying arrangement by the case law has substantially diminished" and stressed the need to prove market power for tying to be considered anticompetitive.[426] The Court also

419 US DOJ and FTC, Guidelines on Licensing arrangements (n 220) § 3.4.

420 Texaco, Inc. v Dagher, 547 US 1 (2006).

421 Broadcast Music, Inc. v Columbia Broadcast. System, Inc., 441 US 1 (1979).

422 See, European Commission, Guidelines on Horizontal Cooperation Agreements (n 382), paras 150–194 (production joint ventures), paras 225–256 (in particular para. 255 for joint ventures on sales).

423 Case 395/87, Ministère public v Jean-Louis Tournier [1989] ECR 2521.

424 Case COMP/C2/38.698–CISAC (July 16, 2008), available at <http://ec.europa.eu/competition/antitrust/cases/dec_docs/38698/38698_4567_1.pdf> (The Commission took the view that a series of measures, including membership and territorial restrictions incorporated in the reciprocal representation agreements concluded between the collecting societies infringed Article 101 TFEU). The Commission's decision was recently partially annulled by the General Court: see Case T-442/08 International Confederation of Societies of Authors and Composers (CISAC) (12 April 2013).

425 Jefferson Parish Hospital District No 2 v. Hyde, 466 U.S. 2, 16 (1984). The fourth element is that a non insubstantial amount of interstate commerce in the tied product is affected.

426 Illinois Tool Works v Independent Ink, 126 S. Ct 1281 (2006).

noted that a patent does not necessarily confer market power on the patentee, thus breaking with a long tradition of precedents that had made that presumption. The 1995 DOJ and FTC Guidelines on Licensing arrangements move to a rule of reason analysis of intellectual property tying arrangements noting that "(a)lthough tying arrangements may result in anticompetitive effects such arrangements can also result in significant efficiencies and procompetitive benefits".[427] According to the Guidelines, agencies are likely to challenge a tying arrangement if (i) the seller has market power in the tying product, (ii) the arrangement has an adverse effect on competition and (iii) efficiency justifications for the arrangement do not outweigh the anticompetitive effects.[428] The Guidelines seem to focus less on evidence of the existence of two separate products.

In EU competition law, for a tying claim to exist "it is a condition that the products and technologies involved are distinct in the sense that there is distinct demand for each of the products and technologies forming part of the tie or the bundle".[429] As it is noted in the Commission's Transfer of Technology Guidelines, "(t)his is normally not the case where the technologies or products are by necessity linked in such a way that the licensed technology cannot be exploited without the tied product or both parts of the bundle cannot be exploited without the other".[430] Tying arrangements escape Article 101 TFEU if the market share of the parties is below the threshold of 20% for agreements between competitors and 30% for agreements between non-competitors, which apply "to any relevant technology or product market affected by the license agreement, including the market for the tied product".[431] Above these market share thresholds the Commission will balance the anti-competitive and pro-competitive effects of tying. Among the efficiency gains considered, the Commission notes instances in which tying is necessary for a technically satisfactory exploitation of the licensed technology, for ensuring conformity to quality standards, for allowing the licensee to exploit the licensed technology significantly more efficiently, or when the licensor has a legitimate interest in ensuring that the quality of the products are such that it does not undermine the value of his technology or his reputation as an economic operator.[432]

Contractual tying may fall under the scope of Article 102 TFEU. Article 102 (d) cites tying as an example of abuse: "making the conclusion of contracts subject to acceptance by the other parties of supplementary obligations which, by their nature or according to commercial usage, have no connection with the subject of such contracts". The implementation of this article requires the difficult task of identifying anticompetitive (affecting consumers) forced package sales, while tolerating those that are not anticompetitive.

In Tetra Pak II the Court of Justice found that even where tied sales of two products are in accordance with commercial usage or there is a natural link between the two products in question, such sales may still constitute abuse within the meaning of Article 102 unless they are objectively justified, thus adopting a quasi-per se illegality standard to the contractual bundling by a dominant firm of two distinct products. The Court adopted a supply-oriented test for defining the condition of two distinct products by noting that for a considerable time there have been independent manufacturers for the tied product and inferring from that that the two products are distinct. The Court also announced the principle that "(a)ny independent producer is quite free, as far as [EU] competition law is concerned, to manufacture consumables intended for use in equipment manufactured by others, unless in doing so infringes a competitor's intellectual property right".[433] In CBET, the Court of Justice held that an abuse is committed where, without any objective necessity, an undertaking holding a dominant position on a particular market reserves to itself or to an undertaking belonging to the same group an ancillary activity which might be carried out by another undertaking as part of its activities on a neighbouring but separate market, with the possibility of eliminating all competition from such undertaking.[434]

This restrictive approach of the EU Courts for contractual tying may have been transformed to a form of structured rule of reason analysis in the recent judgment of the General Court in Microsoft, although this case concerns technological tying.[435] The Commission's Priorities Guidance do not refer to the condition of coercion found in the case law and note that Article 102 may apply where an undertaking is dominant in the tying market and where, in addition, (i) the tying and tied products are distinct products and (ii) the tying practice is likely to lead to anticompetitive foreclosure.[436] The condition of the distinct products is also interpreted more broadly, the Commission considering that "the presence on the market of undertakings specialised in the manufacture or sale of the tied product without the tying product or each of the products bundled by the dominant firm" constitutes indirect evidence (not direct as it was suggested in the previous case law of the Court) of the distinct character of the products.[437]

b. Technological tying

Technological integration or tying has been an area of continuous debate, in view of the trend to integrate multiple functionalities in products in high technology markets. Product design changes and technological integration may give rise to antitrust liability in US antitrust law. In *C.R. Bard, Inc. v. M3 Systems*, the Federal Circuit found improper the modification by Bard of the product design of its biopsy gun in order to prevent its competitor's copycat replacement needles from

427 US DOJ and FTC, Guidelines on Licensing arrangements (n 220) § 5.3.
428 Ibid.
429 European Commission, Guidelines on Transfer of Technology (n 106) para. 191.
430 Ibid
431 Ibid para 192.
432 Ibid paras 194–195.
433 Case C-333/94 P, Tetra Pak v Commission (Tetra Pak II) [1996] ECR I-5991.
434 Case 311/84, CBET v. Compagnie Luxembourgeoise de Télédiffusion SA [1985] ECR 3261
435 Microsoft CFI case.
436 European Commission, Priorities Guidance (n 241) para 50.
437 Ibid para 51.

being used in the guns.[438] In Microsoft II, the Court of Appeals for the Federal Circuit held that the tying by Microsoft of its web browser software with the operating system software was permissible: any "genuine technological integration" combining functionalities in a way that offers advantages unavailable if the functionalities were bought separately and composed by the purchaser would be beneficial to consumers, regardless of whether elements of the integrated package are marketed separately.[439] In Microsoft III, the District of Columbia Circuit, distinguished technological tying, a situation where the tied good is physically and technologically integrated with the tying good, from contractual tying, and applied to the former a rule of reason approach that would neither include a distinct product test (which is according to the Court "backward-looking and therefore systematically poor proxies for overall efficiency in the presence of new and innovative integration"), nor will it infer a restriction of competition from the simple existence of market power, but would require evidence by the plaintiff of anticompetitive effects in the tied product market.[440]

Technological tying is also recognized as a separate form of tying in EU competition law. Since the seminal judgment of the General Court in EU Microsoft I, in order to succeed a technological tying case in EU competition law under Article 102 TFEU, the plaintiff needs to prove that (i) the tying and the tied products are two separate products, (ii) the undertaking concerned is dominant in the market for the tying product, (iii) the practice (an agreement or technological integration) does not give customers a choice to obtain the tying product without the tied product (coercion), and (iv) the practice in question forecloses competition.[441] The Court expressed its reticence to accept technological tying, when this leads to the acquisition of an entrenched dominant position on the market, noting that "although, generally, standardization may effectively present certain advantages, it cannot be allowed to be imposed unilaterally by an undertaking in a dominant position by means of tying".[442] The emergence of a *de facto* standard should be the result of competition between the "intrinsic merits" of the products and *in fine* depends on the consumers' choice rather than on the arbitrary decision of a dominant firm to impose its own standard. The Commission's Guidance paper seems inspired by these principles and applies to technological tying the same conditions as for contractual tying to be found illegal under Article 102 TFEU, noting however that "the risk of anti-competitive foreclosure is expected to be greater where the dominant undertaking makes its tying or bundling strategy a lasting one, for example through technical tying which is costly to reverse" and that "technical tying also reduces the opportunities for resale of individual components".[443] In a subsequent case (EU Microsoft II), the Commission accepted the Redmond firm's commitments to offer a choice screen remedy for the allegedly anticompetitive practice of bundling the Internet browser software with the operating system software.[444] The Commission has recently launched an investigation against Microsoft for not complying with the conditions of the commitment decision.[445]

SUMMARY. Both EU and US antitrust law may apply to bundling and tying practices. US antitrust law has evolved towards a more lenient approach to technological tying, requiring evidence of anticompetitive effects and the consideration of the efficiency gains brought by the practices. This approach is consistent across the different provisions of US antitrust law applying to tying practices. The situation is slightly different in Europe, which views tying by dominant firms with suspicion, in particular if that leads to de facto standardization of the industry, and takes a more aggressive stance against technological tying.

c. Package licensing

With regard to bundled licensing, the US courts have accepted that bundling two related patents together without any restrictions or any requirements regarding use will likely not be examined under a per se illegality rule.[446] In US Philips Corp. v. ITC, the Federal Circuit recognized the pro competitive benefits of package licensing, such as the reduction of transaction costs, hinting to the need for the courts to examine closely the business reasons for the package license and its likely anticompetitive effects.[447]

The Commission's Transfer of Technology Guidelines also apply the equivalent of a rule of reason approach to bundled licensing: the Guidelines recognize the potential precompetitive benefits of package licensing and the state that a package license is likely to violate Article 101 TFEU only if the market share is above the level required by the market share thresholds. Above the market share thresholds it is necessary to balance the anti-competitive and pro-competitive effects of tying.[448]

438 C.R. Bard, Inc. v M3 Systems, 157 F.3d 1340 (Fed. Cir. 1998).

439 United States v Microsoft Corp., 147 F.3d 935 (D.C. Cir. 1998).

440 United States v Microsoft Corp., 253 F.3d 34, 89 (D.C. Cir. 2001).

441 Case T 201/04 Microsoft Corp. v. Commission [2007] ECR II-3601. The European Commission in its Guidance on its enforcement priorities in applying Article 102 TFEU to abusive exclusionary conduct to dominant undertakings, [2009] OJ C 45/7, para. 50 does not refer to the condition of coercion. Indeed, some authors have previously argued that it is redundant: Nicholas Economides and Ioannis Lianos, 'The Elusive Antitrust standard on bundling in Europe and in the United States in the Aftermath of the Microsoft cases' (2009) 76 (2) Antitrust Law Journal 483.

442 Case T 201/04 (n 428) para. 1152.

443 European Commission, Priorities Guidance (n 247) para 53.

444 European Commission, Case COMP/C-3/39.530 – Microsoft (tying) (December 16, 2009), available at http://ec.europa.eu/competition/antitrust/cases/dec_docs/39530/39530_2671_3.pdf: See also, Nicholas Economides and Ioannis Lianos, 'A Critical Appraisal of Remedies in the EU Antitrust Microsoft Cases' 20102 Columbia Business Law Review 346.

445 European Commission, IP/12/1149, Commission sends Statement of Objections to Microsoft on non-compliance with browser choice commitments (October 24, 2012), available at http://europa.eu/rapid/press-release_IP-12–1149_en.htm.

446 US Philips Corp. v. ITC, 424 F3d 1179 (Fed. Cir. 2005) [(Philips' package license of patents for recordable and rewritable compact discs was not per se unlawful and could involve significant efficiencies]. Princo Corp v. ITC, 563 F.3d 1301 (Fed Cir. 2009).

447 Ibid., pp. 1192–1193.

448 European Commission, Guidelines on Transfer of Technology (n 106) paras 191–195.

4. Pricing IP Rights and Competition Law

An area with significant differences between US antitrust law and EU competition law relates to the discretion of IP holders to impose price restrictions, either by demanding high royalties or by imposing post-sale price restraints to the distributors of their products.

a. Royalty stacking, excessive royalties and price discrimination

The persistence of the patent thicket problem with the development of complex products involving numerous inputs with corresponding third-party proprietary rights attached may lead to what is frequently referred to as "royalty stacking". Royalty stacking results from multiple royalty obligations, as various licenses related to different inputs of a product combine to impose aggregate royalty obligations of an extent of 6%–20% (or greater).[449] A similar problem emerges in situations of "royalty packing", where multiple technologies are bundled together (sometimes imposed by the licensor or by best practices within an industry) also increasing the aggregate-royalty problem. Hold up problems may emerge, more so if non-practising entities holding SEP are involved, and may considerably increase the royalties paid. It is possible that the cost burden of royalties will not be based on the actual contribution of the invention to the final product. There are various techniques to deal with royalty stacking and packing: royalty ceilings, royalty floors, variable royalties, and alternatives to royalties, such as lump-sum payments and patent pools with no fee cross-licensing among the members of the pool.

Can "however" the royalty stacking become a competition law problem? One might distinguish between the sanction by competition law of exclusionary practices leading to situations of royalty stacking from that of royalty stacking as such, that is the exploitative practice of demanding excessive royalties. There are different perceptions in the EU and the US on the liability of dominant firms for excessive pricing without exclusionary acts.

With regard to exclusionary practices, competition authorities in Europe and the US have focused on deceptive conduct in the context of a SSO. Patent holders disclosing information on their patents and patent applications prior to the adoption of a given standard can at most demand a royalty that corresponds to the marginal value of their patented technology. However, there are instances in which a patent holder may adopt the strategy to conceal during the standard-setting process this information, let the other stakeholders agree on a standard incorporating a patented technology and reveal the information that the technology is covered by a patent after the standard has gained widespread acceptance, when the negotiating position of the other stakeholders will be weakened as they would have made standard specific investments and will be kept hostage. The patent holder will then be able to demand a royalty that will far exceed the marginal value of the patented technology (the so called "patent ambush" strategy).

In Rambus an FTC order found Rambus's deceit, for concealing its patents and patents and patent applications and for making outright misrepresentations and giving misleading responses to questions about its conduct in the context of the Joint Electron Device Engineering Council (JEDEC) SSO a violation of Section 2 of the Sherman Act and Section 5 of the FTC Act, noting even that deceptive conduct might be found in the absence of an express obligation to disclose.[450] The FTC relied on the fuzzy disclosure obligations imposed to JEDEC members concluding that these incorporated an underlying duty of good faith and inferred from this that JEDEC members had reason to believe that the standard setting process will be cooperative and free from deception. The FTC also argued that Rambus' conduct prevented JEDEC from extracting a commitment from Rambus to license in Reasonable and Non-Discriminatory terms (RAND). Rambus deceit had the effect of distorting JEDEC's choice of technologies and provided Rambus monopoly power. The DC Circuit vacated the order as the FTC failed to prove that for Rambus' deceptive conduct the SSO would have adopted a competing technology (thus there was no exclusionary element).[451] The Court found that had Rambus disclosed the information prior the adoption of the standard, JEDEC would have either excluded Rambus technologies, or require from Rambus a RAND commitment. As to the first issue, the FTC had found evidence in its investigation that, had Rambus disclosed the information, JEDEC would have incorporated anyway Rambus' technologies. As to the second issue relating to the RAND commitment, the Court advanced that exploitative abuses are not considered as producing an antitrust harm in US antitrust law.[452] The Court also expressed reservations as to the standalone use of Section 5 FTC Act in this context and developed limiting principles for its use.

Another case involved an action against US chipset manufacturer Qualcomm, holder of IP rights in mobile telephone standards. Qualcomm made a promise before the adoption of the standard to license essential proprietary technology on RAND terms. The Third Circuit in Broadcom Corp. v Qualcomm, found that intentionally deceiving the SSO with respect to a royalty commitment could constitute a monopolization cause of action under the following conditions: (1) in a consensus-oriented private standard setting environment,

449 On this practice, see, Einer Elhauge, 'Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?' (2008) 4 Journal of Competition law & Economics 535; Thomas F Cotter, 'Patent Holdup, Patent Remedies, and Antitrust Responses' (2009) 34 (4) The Journal of Corporate Law 1151, 1160; Joseph Farrell et al, 'Standard Setting, Patents, and Hold-Up: A Troublesome Mix' (2007) 74 (3) Antitrust Law Journal 603; Mark A Lemley and Carl Shapiro, 'Patent Holdup and Royalty Stacking' (2007) 85 Texas Law Review 1991; Gregory J Sidak, 'Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro' (2008) 92 Minnesota Law Review 714.

450 In the matter of Rambus, Inc. (August 2, 2006), Docket No. 9302, pp. 34–35 available at http://www.ftc.gov/os/adjpro/d9302/060802commissionopinion.pdf

451 Rambus Inc. v. FTC, 522 F3d 456 (DC Cir. 2008), cert. denied, 129 S. Ct. 1318 (2009).

452 Ibid., pp. 464–467.

(2) a patent holder's intentionally false promise to license essential proprietary technology on RAND terms, (3) coupled with an [Standard Determining Organization's] reliance on that promise when including the technology in a standard, and (4) the patent holder's subsequent breach of that promise, is actionable anticompetitive conduct.[453] Broadcom relies heavily on the FTC's analysis in Rambus, emphasizing that deception becomes an antitrust concern only where rival technologies are excluded from the market and consequently consumer welfare is harmed.

One could finally add the recent standalone enforcement of Section 5 of the FTC Act in Negotiated Data Solutions (N-Data), Robert Bosch GmbH and Google. In these cases the FTC attempted to articulate circumstances in which conduct related to SEP royalties could fall within the scope of Section 5 FTC Act, either as an unfair method of competition or as an unfair act or practice. Hence, in N-Data, the FTC found that Section 5 could reach conduct that would not violate the antitrust laws, as long as the conduct has some element of coercion or oppressiveness, it causes substantial harm to consumers, which is not easily avoidable by consumers themselves and which is not outweighed by countervailing benefits to consumers or competition. In Bosch, the FTC made explicit that "(p)atent holders that seek injunctive relief against willing licensees of their (F)RAND-encumbered SEP's should understand that in appropriate cases the Commission can and will challenge this conduct as an unfair method of competition under Section 5 of the FTC Act".[454] In Google, the FTC found that Google's threat of injunctions against possible infringers of its SEP "would likely increase costs to consumers because manufacturers using Google's SEP's would be forced, by the threat of an injunction, to pay higher royalty rates, which would be passed on to consumers".[455]

Despite this recent extension of the scope of Section 3 FTC Act, US antitrust law does not apply to purely exploitative practices. Although this had always been the case,[456] it has been made clearer recently in Verizon v Trinko, the Supreme Court noting that "(t)he mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices – at least for a short period – is what attracts "business acumen" in the first place; it induces risk taking that produces innovation and economic growth".[457] "Fair" royalties are not an aim that may be pursued through US antitrust law.

In Europe, however, excessive prices (royalties) may be found to infringe Article 102 (a) TFEU which may apply to purely exploitative conduct (exploiting consumers directly without any requirement to prove any exclusionary conduct), in particular conduct that is "directly or indirectly imposing unfair purchase or selling prices or other unfair trading conditions". In United Brands, the Court of Justice held that a price may be found excessive if it has no reasonable relation to the economic value of the product supplied.[458] According to the Court, this excess could, inter alia, be determined objectively if it was possible for it to be calculated by making a comparison between the selling price of the product in question and its cost of production, which would disclose the amount of the profit margin.[459] A two-steps analysis is effectuated: it has to be determined "whether the difference between the costs actually incurred and the price actually charged is excessive, and, if the answer to this question is in the affirmative, whether a price has been imposed which is either unfair in itself or when compared to competing products".[460] These two conditions (steps) are cumulative. Evidence of an excessive profit margin is not sufficient in itself to prove an abuse. The EU competition authorities employ a cost/price approach in order to determine the excessive character of a profit margin.

A possible option is to determine an adequate cost measure to measure profit (adopt a cost-plus approach), compare that to the price and then to assess the excessiveness of the profit margin, the last operation involving the definition of some benchmarks. However, the definition of the relevant costs becomes a daunting task in the context of IP rights related conduct, as developing new technology involves R&D expenses, thus high fixed costs, which it would be difficult to assess, as firms engage in multiple projects and intense cross-subsidization between successful and unsuccessful projects. Common costs used for the development and production of different technologies (particularly in situations of cumulative innovation), makes the operation even harder. In Scandlines, the Commission rejected a cost-plus approach (add to marginal cost a reasonable profit calculated as a percentage of a production cost) for an approach that would look to whether the price had a reasonable relation to the economic value of the service supplied and would integrate additional costs (e.g. sunk costs, opportunity costs) and factors not reflected in the audited profits and costs (e.g. intangible value of the assets).[461] How much profit margin will be deemed excessive is another important issue. In United Brands, the Court held that a profit margin of 7% is not sufficient.[462] Some profit margin would also be entirely justified in dynamic industries or industries with network effects.

453 Broadcom Corp. v. Qualcomm, 501 F.3d 311 (3d Cir. 2007).

454 In re Robert Bosch GmbH, File Bo 121–0081 (November 26, 2012), p. 2.

455 Some commissioners issued dissenting or concurring opinions opposing the extension of Section 5 FTC Act to catch conduct that is only remotely exclusionary and mostly exploitative. For example, in Google, Commissioners Ramirez and Ohlausen believed that this conduct should not fall within the authority of the FTC and that courts are better suited than the FTC to decide complex licensing disputes. Commissioner Rosch would have preferred to constrain the discretion of the FTC with more explicit limiting principles, such as that the conduct occurs in situations of monopoly or near-monopoly power, it causes particularly pernicious anticompetitive harm and is the result of deceptive conduct.

456 See, for instance, Berkey Photo, Inc v. Eastman Kodak Co., 603 F2d 263, 294 (2nd Cir. 1979), cert. denied, 444 US 1093 (1980).

457 Trinko case (n 119).

458 Case 27/76 United Brands v. Commission [1978] ECR 207.

459 Ibid para. 251.

460 Ibid para. 252.

461 European Commission Decision, Scandlines Sverige AB v Port of Helsingborg, COMP/A 36.568/D3, (July 23, 2004) available at (paras 209, 224, 226–227, 234–235). See also in an IP context, Attheraces Limited v. The British Horseracing Board Limited [2007] EWCA Civ 38, the Court of appeal holding that the High Court had been wrong to regard the "economic value" of the pre-race data as limited to the product of the cost + formula.

462 Case 27/76, United Brands (n 458), para. 266.

As to the adequate benchmark prices that would define the "unfair" character of the prices charged, a comparison with the prices charged by competitors might be a possible option (although one should be cautious, as price differences may indicate quality differences). In United Brands the Court noted that "other ways may be devised– and economic theorists have not failed to think up several– of selecting the rules for determining whether the price of a product is unfair".[463] Other options include the comparison with the price of the product over different geographic markets.[464] In Kanal 5, the remuneration model applied by the Swedish Copyright Management Organisation (STIM), relating to the broadcast of musical works protected by copyright, which calculated the amount of royalties on the basis of the revenue of companies broadcasting those works and the amount of music broadcast, was found to be an abuse for the simple reason that another method would enabled the use of those musical works and the audience to be identified and quantified more precisely.[465] As it is also observed in the Commission's Guidance on the Transfer of Technology agreements, on the question of whether fees charged for access to IPR in the standard-setting context are unfair or unreasonable in the presence of a (F)RAND commitment, "cost-based methods are not well adapted to this context because of the difficulty in assessing the costs attributable to the development of a particular patent or groups of patents"; It may be better, instead, "to compare the licensing fees charged by the company in question for the relevant patents in a competitive environment before the industry has been locked into the standard (ex ante) with those charged after the industry has been locked in (ex post)".[466] However, the determination of the excessive nature of pricing in an IP context is notoriously difficult.

There has been some recent enforcement of that provision to excessive pricing in the context of a royalty stacking claim. In Rambus, the Commission found that Rambus had engaged in a "patent ambush" based on the same behavior examined by the FTC in this case, but reaching a different conclusion than the US competition authority.[467] The Commission turned the patent ambush claim into one that Rambus had charged excessive royalties for its patents and applied Article 102 (a). An Article 9 commitment decision capped the licensing fees Rambus could charge for its SEPs.[468]

Unfairly low prices may also be a concern for the application of Article 102 (a). This does not concern predatory prices, but situations in which a dominant buyer purchases inputs at unfairly low prices. These are determined according to a comparison between the price paid and the economic value of the service provided. In CICCE, the Court examined an action for annulment against a decision of the Commission relating to conduct by some French television stations holding exclusive broadcasting rights to pay low license fees for the rights of films and accepted that article 102 (a) could apply in these circumstances, although in this case the Commission had not found an abuse, as it was impossible, in view of the variety of the films and the different criteria for assessing their value, to determine an administrable yardstick valid for all firms, since each film is different.[469]

Price discrimination forms also a standalone Article 102 TFEU violation. The European competition authorities have applied articles 102 (b) and 102 (c) to different practices, but article 102 (c) particularly focuses on secondary line injury, that is situations in which a non-vertically integrated dominant undertaking price discriminates between customers with the effect of placing several of them or one of them at a competitive disadvantage with regard to the others. Hence, it constitutes a purely exploitative practice and another illustration of the divergence between the EU and the US models on the way unilateral practices of dominant firms are dealt in competition law. In contrast, first line injury involves a dominant firm applying different prices to its competitors and thus constitutes an example of exclusionary practice. Article 102 (c) has nevertheless applied to all types of discriminatory prices, this area of EU competition law being particularly fuzzy.

There has been a lot of discussion recently on targeting purely exploitative behaviour, such as excessive royalties, through the means of Article 102 (a) and the issue of royalty stacking occurring in the context of standard-setting and eventual hold up situations.[470] One should bear in mind that the Enforcement Priority Guidance of the Commission on Article

463 Ibid para. 253.

464 Case 27/76, United Brands (n 458) para. 239; Case 395/87, Ministère Public v. Tournier [1989] ECR 2521; Case 110/88, Lucazeau v. SACEM, [1989] ECR 2811, the last two cases on the level of royalties charged by the French collecting society SACEM for playing recorded music in discotheques (acknowledging that important price differentials between Member States could indicate an abuse, unless the undertaking justifies the difference by reference to objective dissimilarities between the situation in the Member State concerned and the situation prevailing in all the other Member States).

465 Case C-52/07, Kanal 5 Ltd v Föreningen Svedska Tonsättares Internationella Musikbyrå (STIM) UPA [2009] ECR I-9275.

466 EU Horizontal Cooperation Agreements Guidelines (n 409) para. 289.

467 European Commission Decision, Rambus, COMP/38.636 (December 9, 2009), available at http://ec.europa.eu/competition/antitrust/cases/dec_docs/38636/38636_1203_1.pdf

468 See also the statement of objections sent to Qualcomm by the European Commission for the fact that its licensing terms and conditions for its patents essential to the standard did not comply with its own (F)RAND commitment and had led to excessive royalties. The Commission abandoned the case.

469 Case 298/83, Comité des industries cinématographiques des Communautés européennes v. Commission [1985] ECR 1105.

470 See, Massimo Motta and Alexandre de Streel, 'Exploitative and Exclusionary Excessive Prices in EU Law' in Claus-Dieter Ehlermann and Isabela Atanasiu (eds), What is an Abuse of a Dominant Position? (Hart Publishing 2006) 91; Emil Paulis, 'Article 82 EC and Exploitative Conduct' in Claus-Dieter Ehlermann and Mel Marquis (eds), European Competition Law Annual 2007: A Reformed Approach to Article 82 EC (Hart Publishing 2008) 515; Lars Hendrik Röller, 'Exploitative Abuses' in Claus-Dieter Ehlermann and Mel Marquis (eds) European Competition Law Annual 2007: A Reformed Approach to Article 82 EC (Hart Publishing 2008) 525; David S Evans and Jorge A Padilla, 'Excessive Prices: Using Economics to Define Administrable Legal Rules' (2005) 1 Journal of Competition Law & Economics 97; Mark Furse, 'Excessive Prices, Unfair Prices and Economic Value: The Law of Excessive Pricing under Article 82 and the Chapter II Prohibition' (2008) European Competition Journal 59; Ariel Ezrachi and David Gilo, 'Are Excessive Prices Really Self-Correcting?' (2009) 5 (2) Journal of Competition Law & Economics 249.

102 does not cover exploitative abuses. Commentators have expressed a number of reservations on this issue:

(i) Assessing excessive pricing may be hard. What should be the right benchmark: a competitive price? But what does this mean? Duopoly? Perfect or imperfect competition? How can it be calculated? If one allows some margin above competitive price, what is the magnitude of this margin? How to establish reasonable return on investment?

(ii) Setting clear rules for compliance in dynamic markets is even harder; How should these rules apply in dynamic markets, where there is upfront investment for the future? Should one require high ex post margins to incentivise ex ante risky investments (e.g. in R&D)? It is important to acknowledge that high margins on some activities may be required to cover fixed costs that are common across activities;

(iii) Remedies for excessive pricing can equate to price regulation (either implicitly or explicitly);

(iv) Price regulation can be distortive to competition, investment and R&D; Price regulation can inhibit entry/expansion by competitors, can distort investment incentives, can distort incentives for marketing and R&D – i.e. "portfolio pricing" approach (in view of the fact that the majority of R&D projects fail), may distort pricing incentives; Proponents of this view suggest that there may need to be explicit regulation for certain areas of natural monopoly – such as utilities – but this should be done carefully by sector-specific regulators. The rest of the economy should be left alone – since the risks of careless and ill-informed intervention outweigh any potential benefits;

(v) The problem will typically solve itself, since high profits encourage entry.

(vi) Defining what constitutes an excessive price is too complicated for competition authorities or the courts, which are not the adequate institutions for this task.

Commentators have also suggested a number of limiting principles to the application of article 102 (a) to purely exploitative practices. This should apply only in narrow circumstances. There is wide agreement as to possibility to apply Article 102 (a) when (i) There are very high and long lasting barriers to entry (and expansion); and (ii) the firms (near) monopoly position has not been the result of past innovation or investment. Yet some authors propose additional conditions. For example, Evans and Padilla suggest that as well as meeting the first two conditions it is necessary that (iii) the prices charged by the firm widely exceed its average total costs; and (iv) there is a risk that those prices may prevent the emergence of new goods and services in adjacent markets[471]. Geradin, Layne-Farrar and Petit would add that there needs to be some form of an exclusionary element or deceptive practice.[472] Röller would have applied it only to situations of "enforcement gap".[473] Motta and De Streel argue that "there should be no sector-specific regulator".[474] Paulis disagrees with the sector regulator point, noting that the Commission should maintain the option to intervene when a national regulator is not acting or is taking decisions that are not in conformity with Community law.[475] One could however challenge the requirement that the exploitative practice results from some form of deceptive practice or exclusionary conduct to be contra legem, as the text of Article 102 (a) envisages unfair prices as a separate violation than the abuse of "other unfair trading conditions". If we apply Article 102 (a) only to practices that involve some exclusionary or deceptive conduct element that would jeopardize the full effect of Article 102 (a) and the type of practices it aims. The strength of the case for intervention will of course vary and will be stronger if all these conditions are present. Others have criticized the assumption often made that markets are self-correcting and that high prices encourage entry.[476]

One could also oppose the argument over the incapacity of courts and competition authorities to define what constitutes an excessive price by referring to the role of the courts in evaluating damages in the context of competition disputes or IP infringement cases. The Commission has published detailed non-binding guidance on the different methodologies available for evaluating competition law damages.[477] Similar guidance may be published for exploitative practices. US courts proceed quite often to the examination of complex econometric evidence in antitrust disputes. Finally, US courts have developed the so called Georgia-Pacific list of factors that are supposedly relevant to determining the amount of a reasonable royalty.[478] Competition authorities and courts are also involved in the policing of compulsory licensing remedies and assess the reasonableness of royalties required. Following the decision of the European Commission finding that Microsoft's refusal to provide interoperability infringed Article 102 TFEU, Microsoft was required to grant access to and authorize the use of the interoperability information on reasonable and non-discriminatory terms. The European Commission suggested that the assessment of the reasonableness of Microsoft's prices depended on "whether there is innovation in the protocols, and if there is, what is charged for comparable technologies in the market".[479] According to the Commission, "such a remuneration should not reflect the

471 Evans and Padilla, (n 470).

472 Damien Geradin, Anne Layne-Farrar and Nicolas Petit, EU Competition Law and Economics (Oxford University Press 2012) 289.

473 Röller, (n 470).

474 Motta and de Streel (n 470).

475 Paulis (n 470).

476 Ezrachi and Gilo (n 470).

477 Draft Guidance Paper, Quantifying harm in actions for damages based on breaches of Article 101 or 102 of the TFEU (June 2011), available at <http://ec.europa.eu/competition/consultations/2011_actions_damages/draft_guidance_paper_en.pdf> last accessed 28 April 2013

478 Georgia-Pacific Co. v United States Plywood Co., 318 F.Supp. 1116, 1120 (S.D.N.Y. 1970),mod'd, 446 F.2d 295 (2d Cir. 1971). It is noteworthy that the Georgia Pacific factors, as developed and applied by the courts for determining reasonable royalties in patent damage cases, have been recently applied by U.S. courts also in the (F)RAND context (see ESS Tech., Inc. v. PC-Tel, Inc., No. C-99–20292 RMW, 2001 WL 1891713, at 3–6 (N.D.Cal. Nov. 28, 2001), Rambus, Broadcom etc).

479 Commission Microsoft Decision (n 228), paras 1005–1009.

strategic value, stemming from Microsoft's market power". In this case, the benchmark for the calculation of royalties was the incremental value of Microsoft's protocols over the prior art and the royalties agreed among third parties for comparable technologies. Following the remedy imposed by the Commission, Microsoft submitted its remuneration schemes, containing principles for pricing the interoperability information, as these were negotiated by the parties. The Commission found that some of the remunerations charged by Microsoft for non-patented information were unreasonable and imposed periodic penalties.[480] The General Court confirmed the control effectuated by the Commission of the reasonableness of the royalties' rate charged.[481]

SUMMARY. The application of competition law to pricing practices involving IP rights, even in the absence of any exclusionary conduct, constitutes a burning issue in EU competition law. US antitrust law has recently expanded the scope of Section 5 of the FTC Act to cover the exploitative effects of deceptive practices, while developing some limiting principles. The application of competition law to this type of practices might bring more problems than those it may solve, depending of course on the circumstances of the case and the capabilities of the specific competition authority or courts. Applying competition law to exploitative practices may however be justified when there are very high and long lasting barriers to entry (and expansion) and the (near) monopoly position has not been the result of past innovation or investment.

b. Post-sale restraints on IP distribution

(i) Resale price maintenance of IP protected goods

While naked horizontal price fixing agreements or more generally agreements to restrict output or supply are subject to the per se prohibition rule, since the seminal judgment of the Supreme Court in Leegin, vertical price fixing is subject to the rule of reason.[482] The case law of the Supreme Court supersedes of course section 5.2. of the Guidelines on Licensing arrangements,[483] which still quote the position of the Supreme Court under the older precedent of Dr. Miles.[484]

While EU competition law does not provide for the possibility of per se prohibitions, as article 101 (3) may provide an exception for any restriction of competition, if the four conditions of this article are fulfilled, resale price maintenance constitutes a hardcore restriction that falls within the scope of the prohibition principle of article 101 (1). It is also explicitly excluded from the benefit of the block exemption regulation on the transfer of technology agreements[485] and it is highly unlikely that it might benefit from an individual exception under Article 101 (3), because often such restrictions are not the only way to achieve efficiency gains, other less restrictive to competition alternatives offering an additional option to attain them.[486]

(ii) Vertical territorial limitations

Territorial restrictions limiting the geographic area in which one or more parties may conduct activity or sell products are also treated differently in US antitrust law and EU competition law. Although horizontal territorial restrictions are typically subject to a per se illegality rule, vertical territorial restrictions are assessed under the rule of reason and are considered as serving precompetitive ends.[487] In Europe, territorial restrictions that lead to absolute territorial protection constitute hardcore restrictions, excluded from the benefit of the block exemption regulations.[488]

(iii) Vertical customer restrictions and field of use restrictions

Customer restrictions included in an agreement between non-competitors are examined in US antitrust law under the rule of reason.[489] In contrast, in Europe, customer restrictions are considered as hardcore restrictions, excluded from the benefit of the block exemption regulation, some exceptions notwithstanding (e.g. field of use restrictions).[490] Field of use restrictions (restrictions under which the licence is either limited to one or more technical fields of application or one or more product markets) are also considered as pro-competitive and subject to the rule of reason.[491] In EU Competition law, these restrictions may benefit from the block exemption, but up to the market share threshold.[492] The divergence between US antitrust law and EU competition law may be explained by the focus of the latter on market integration and

480 Commission Decision, Microsoft (COMP/C-3/37.792) [2009] OJ C 166/20.

481 Case T-167/08, Microsoft Corp. v. European Commission [June 27, 2012], (noting that the distinction between the strategic value and the intrinsic value of the technologies covered is a basic premise of the assessment of the reasonableness of any remuneration charged).

482 Leegin Creative Leather Prods., Inc. v. PSKS, Inc., 551 U.S. 877 (2007).

483 US DOJ and FTC Guidelines on Licensing Arrangements (n 220) § 5.2.

484 Dr. Miles Med. v. John D. Park & Sons, 220 U.S. 373 (1911). See, however, the position of the Supreme Court in in United States v. General Electric, 272 U.S. 476 (1926), where the Supreme Court held that a restraint on the licensee's sale price was not unlawful as long as the restriction applied only to the first sale of the patented article.

485 Under article 4.2 (a) of Regulation 772/2004 (n 226). See also, article 4 of Regulation 330/2010 (for vertical agreements) if the main purpose of the agreement is distribution. Maximum sale prices or recommended sale prices do not, however, constitute hardcore restrictions, provided that they do not amount to a fixed or minimum sale price as a result of pressure from, or incentives offered by, any of the parties.

486 EU Guidelines on the Transfer of Technology Agreements (n 108) para. 97.

487 US DOJ and FTC Guidelines on Licensing Arrangements (n 226) § 2.3.

488 Article 4 (2) b of Regulation 772/2004, op. cit. if the agreement is a technology transfer agreement (practices that have as their direct or indirect object the restriction of passive sales by licensees of products incorporating the licensed technology), or Article 4 of Regulation 330/2010 if it is a distribution agreement.

489 US DOJ and FTC Guidelines on Licensing Arrangements (n 226) § 2.3.

490 Article 4 (2) b Regulation 772/2004, op. cit.

491 US DOJ and FTC Guidelines on Licensing Arrangements (n 226) § 2.3.

492 Articles 4 (2) b (i), (ii), (iii), (iv), Regulation 772/2004, op. cit. EU Guidelines on the Transfer of Technology Agreements (n 108) paras 100–105. Although the technical field of use restriction may correspond to certain groups of customers within a product market, the Commission explains the difference between customer restrictions (which are hardcore restrictions) and field of use restrictions (that are exempted) by the fact that the latter must be defined objectively by reference to identified and meaningful technical characteristics of the licensed product. A field of use restriction certainly limits the exploitation of the licensed technology by the licensee to one or more particular fields of use without however limiting the licensor's ability to exploit the licensed technology.

the generally more negative stance it takes against exclusivity clauses.

5. IP Settlements and Competition Law

A recent area of competition law enforcement to IP rights related conduct involves settlements of IP infringement disputes. These practices have been particularly preeminent in the pharmaceutical industry, where pioneer drug companies use a tool-box of patent-related practices that contribute to delays in generic entry. Most practices generate from the intersection of competition law with two regulatory regimes: patent law and market authorization regulation. The regulation for market authorizations delays competition by generics for years beyond the patent period for brand name drugs. A pioneer pharmaceutical company (originator) must invent the drug (active ingredient, formulation, delivery system), develop it, conduct safety and efficacy studies, then satisfy the Food and Drug Administration (FDA) in the US that the drug is both safe and effective. In Europe, the originator has the choice of either a national authorization procedure, a decentralized procedure, a mutual recognition procedure, or a centralized procedure. Each country within the EU has its own procedures for authorizing a marketing application for a new drug but the originator can also seek approval from several EU countries simultaneously using the decentralized or mutual recognition procedure for products that fall outside the scope of the European Medicines Agency. Under the mutual recognition procedure, destination countries recognize a product that has been first authorized by one country in the EU in accordance with the national procedures of that country. European drug approvals are overseen by the European Medicines Agency, which is responsible for the scientific evaluation of applications for authorization to market medicinal products in Europe (via the centralized procedure). This procedure takes at least 210 days (although it is possible to conduct an accelerated assessment in 150 days).

Because of the time consuming and complex pre-marketing requirements, regulators in both Europe and the US have made efforts to extend the exclusivity period for pharmaceuticals, while promoting competition on price by generics. In Europe, a specific regulation has put in place a supplementary protection certificate (SPC) for medicinal products, extending the patent right for a maximum of five years and enabling the holders of both a patent and an SPC for a medicinal product to enjoy a maximum period of up to 15 years' effective protection in every Member State from the time the medicinal product in question first receives marketing authorisation in the EEA. In the US, the Hatch-Waxman Act[493] extended the drug patent term for as much as five years to take into account the lengthy FDA approval process. However, it balanced this extension of the exclusivity by granting generic producers the possibility to rely on branded manufacturers' prior FDA testing and the demonstration of therapeutic equivalence to an originator company's approved drug (abbreviated application process or ANDA), hence permitting generic producers to enter the market before patent expiration if the branded manufacturer's patent was either invalid or not infringed by the generic. It also injected an incentive for generic producers to challenge drug patents and seek early entry by granting the first filer a 180-day period of exclusivity in the generics market. However, the Act also provided the originators with the right to bring infringement suit under listed patents within 45 days of notice from the generic. Furthermore, the FDA is barred from approving the ANDA for thirty months in the ordinary case. We will examine how this specific regime may generate litigation and may have incentivized originators and generics to conclude agreements that may restrict competition.

Any delay for the entry of generic drugs in the market produces negative welfare effects for consumers and the national health systems. According to the European Commission's Pharmaceutical sector inquiry in 2009, the price at which generic companies enter the market is on average, 25% lower than the price of the originator medicines prior to the loss of exclusivity.[494] Furthermore, in markets where generic medicines become available, average savings to the health system are almost 20% one year after the first generic entry, and about 25% after two years (EU average). The inquiry showed that because of the strategies of originators marketing authorisations were granted on average four months later in cases in which an intervention took place and produced evidence that such practices generated significant additional revenues on a number of originator products.

Originators may abuse the different regulatory regimes in order to limit competition by generics and block their market entry. First, they have developed patent strategies to extend the breadth and duration of their patent protection, by filing numerous patent applications for the same medicine (forming the so called "patent clusters" or "patent thickets"). Patent clusters make it more difficult for generic competitors to determine if they could develop a generic version of the original medicine without infringing one of the many patents of the originator company and can lead to uncertainty thus affecting the ability of generic competitors to enter the market. Second, originator companies may fill voluntary "divisional patent" applications, most prominently before the EPO. These split an (initial) parent application and can extend the examination period of the patent office, which adds to the legal uncertainty for generic companies. Third, they may market generic versions of their own drugs, which are typically marketed before the genuine generic enters the market so as to capture a significant part of the market share and reduce the incentive of generics to enter the market, a form of "evergreening" (making minor changes to the formulation of the drug in order to prevent the launch of less expensive generics). Fourth, originators may argue data exclusivity for their products in order to oppose marketing authorisations for a generic product. Fifth, they may introduce patent litiga-

493 21 U.S.C. §355.

494 European Commission, Pharmaceutical Sector Inquiry, Final Report (n 43).

tion against generics.[495] Taking into account that the average duration of court proceedings in EU Member States is 2.8 years, in some jurisdictions this going up to 6 years, and the higher percentage of opposition procedures in the pharmaceutical sector for EPO's patents, the duration of the procedures severely limits the generic companies' ability to enter timely the market. In some cases, all these practices may be combined in an exclusionary strategy.

Facing these increasing hurdles, generic companies find rational to conclude settlement agreements with the originators. Originators have also an incentive to conclude settlements as they have prevailed in less than the half of cases (75% in the US[496]), despite the strong presumption that requires accused infringers to prove patent invalidity by clear and convincing evidence. Settlements typically limit the ability of the generic company to enter the market (the generic agrees not to market for part or all of the patent term or not to challenge the validity of the patent) but a significant proportion of these settlements contains, in addition to this restriction, a value transfer from the originator company to the generic, most often a direct payment ("pay for delay" or "reverse settlements") or a form of license or a future supply relationship, as side-deals. Indeed, as it was noted in the Commission's Pharmaceutical sector inquiry, between 2000 and 2007, originator companies and generic companies entered into a large number of agreements concerning the sale/distribution of generic medicines, one third of which were concluded with generic companies before the originator company's product lost exclusivity ("early entry agreements"). These "early entry" agreements contain clauses that provide for a certain type of exclusive relationship between the contracting parties, their duration typically exceeding the date of loss of exclusivity on average by more than two years.[497] For most of those agreements, the generic products were the first generic products on the market and, thus, were likely to benefit from certain first mover advantages.

The incentive structure for generics and originators established by the Hatch-Waxman Act may encourage the use of litigation, reverse settlements and other early entry agreements. Indeed, while the originator risks the end of exclusivity and lost profits on sales of the drug, the first generic to get ANDA benefits from the exclusivity period of 180 days, the prices, during this period, being on average quite high and dropping even more after the end of the generic exclusivity period.[498] The pay-for-delay provisions costing the branded companies far less than the profits they would lose from price competition, while generic makers gaining far more than they would from competing on the market, both sides benefit from the settlement to the detriment of the consumers who lose access to lower-priced generics.[499] The amount of these side payments may be significant: in Cipro, the originator agreed to make payments which totaled $398 million. The Commission found in its Pharmaceutical sector inquiry that patent settlements in Europe totaled transfers to generics of about 200 million Euros from 2000 to 2007. In other words, with these settlements, originators and generics divide monopoly profits.

Different approaches have been proposed in order to reconcile intellectual property and competition law in this context.[500] One approach would be to examine the scope of the IP right and determine if the exercise of market power was inside the scope of the patent or outside. If the alleged infringer would have been able to stay on the market and compete but for the settlement, then the settlement might enable the patent holder to exercise market power outside the scope of the patent right, and the reverse settlement will be found unlawful. If it would not have been possible for the alleged infringer to continue to compete, then it is unlikely that the settlement would violate competition law. Another approach would be to focus on the welfare effects of the practice and examine if the proposed settlement generates "at least as much surplus for consumers as they would have enjoyed had the settlement not been reached and the dispute instead (were) resolved through litigation".[501] This approach would require decision-makers to "finely calibrate the likelihood of entry", based on the probabilistic strength of the patent litigation.[502] Finally, another approach would not find an infringement of competition law so long as the parties were settling a legitimate IP dispute and the settlement was within the potential scope of the IP right. Challenges to patent settlements can go forward only if the infringement suit is "objectively baseless", thus applying the first prong of the sham litigation test. Some would go even as far as requiring evidence of both prongs of the sham litigation test and/or the Walker Process test for fraudulent litigation.

The treatment of reverse settlements in US antitrust law has been a subject of great controversy, the FTC being actively engaged in this area.[503] US appellate courts had also the occasion to examine a number of these cases, taking different perspectives.[504] In Cardizem, the 6th Circuit held that reverse money payment was a significant factor ("bolster [ing]

495 See, our analysis, op. cit. The Commission noted in the Pharmaceutical sector inquiry that the number of patent litigation cases between originator and generic companies increased by a factor of four between 2000 and 2007.

496 Federal Trade Commission, Generic Drug Entry Prior to Patent Expiration: An FTC Study, (July 2002), available at http://www.ftc.gov/os/2002/07/genericdrugstudy.pdf, pp. 19–20.

497 European Commission, Pharmaceutical Sector Inquiry – Final Report (n 43), p. 10.

498 For an analysis, see Federal Trade Commission, Generic Drug Entry Prior to Patent Expiration: An FTC Study (July 2002), available at http://www.ftc.gov/os/2002/07/genericdrugstudy.pdf

499 FTC Staff Study, How Drug Company Pays-Offs Cost Consumers Billions (January 2010), available at http://www.ftc.gov/os/2010/01/100112payfordelayrpt.pdf

500 For further analysis, see, ABA Section of Antitrust Law, Intellectual Property and Antitrust Handbook (2007), pp. 252–270.

501 Carl Shapiro, 'Antitrust Limits to Patent Settlements' (2003) 34 Rand Journal of Economics 391, 395–396.

502 ABA Section of Antitrust Law, op. cit., p. 256.

503 See,<http://www.ftc.gov/opa/reporter/competition/payfordelay.shtml>accessed 29 April 2013.

504 In re Cardizem CD Antitrust Litig., 332 F.3d 896 (6th Cir. 2003) (Cardizem), cert. denied, Andrx Pharm., Inc. v Kroger Co., 543 U.S. 939 (2003); Ark. Carpenters Health & Welfare Fund v Bayer AG, 604 F.3d 98, reh'g en banc denied, 625 F.3d 779 (2d Cir. 2010); In re Ciprofloxacin Hydrochloride Antitrust Litig., 544 F.3d 1323 (Fed. Cir. 2008); In re Tamoxifen Citrate Antitrust Litig., 466 F.3d 187 (2d Cir. 2006); Schering-Plough Corp. v. F.T.C., 402 F.3d 1056 (11th Cir. 2005); Cipro, 544 F.3d at 1323, (Fed. Cir. 2008).

the patent's effectiveness") in finding settlement agreement pending appeal per se illegal.[505] The case was distinguished by the Second, Eleventh, and Federal Circuits, which considered that there was no violation for the Sherman Act so long as settlements are limited to the scope of the patent, absent fraud or sham litigation. Different reasons were advanced for this more lenient policy: the redistribution of risks by the Hatch-Waxman Act in favor of generics (allowing generic manufacturers to challenge the validity of the patent without incurring the costs of market entry or the risks of damages from infringement), the statutory presumption of patent validity, the favorable view over final settlements of litigation, as this reduces litigation costs. While refusing to grant certiorari in six cases, the Supreme Court has recently taken Federal Trade Commission, Petitioner v Watson Pharmaceuticals, Inc., et al, wherein two generic drug manufacturers agreed to delay their entry into the market in exchange for a share of profits from the sale of brand-name drug AndroGel and the judgment is awaited in the following months.[506]

With regard to EU competition law, no-challenge clauses often included in patent settlements agreements have generally been considered as not falling within the scope of Article 101 (1) TFEU, unless the agreements are not directly connected to the settlement.[507] As the Commission has recently noted in its Pharmaceutical industry sector inquiry and its recent proposal for revised guidelines on the Transfer of Technology agreements, no-challenge clauses may nevertheless infringe Article 101 (1) "where the licensor knows or could reasonably be expected to know that the licensed technology does not meet the respective legal criteria to receive intellectual property protection, for example where a patent was granted following the provision of incorrect, misleading or incomplete information", thus adopting for this type of practice an intent test. With regard to reverse settlements, the Commission has sent statement of objections to Lundbeck and Les Laboratoires Servier for having entered into agreements that foresaw substantial value transfers from the originator to the generics in order to delay their entry in the market.[508] The recent proposal for revised Guidelines of the European Commission on Transfer of Technology agreements, currently in public consultation, mentions for the first time, reverse settlements, noting that "agreements between competitors which include a licence for the technology and market concerned by the litigation but which lead to a delayed or otherwise limited ability for the licensee to launch the product on this market may under certain circumstance be caught by Article 101 (1)". They add that "(s) crutiny is necessary in particular if the licensor provides an inducement, financially or otherwise, for the licensee to accept more restrictive settlement terms than would otherwise have been accepted based on the merits of the licensor's technology".[509]

SUMMARY. The explosion of IP litigation, in particular in the peculiar regulatory context of the pharmaceutical industry, has led patent holders to employ a number of strategies so as to delay the entry of generics in the market to the detriment of consumers. Some of these practices take the form of reverse settlements or pay for delay settlements and early entry agreements. Both US and EU competition law have examined these practices and in some cases have concluded that they may infringe competition. However, the competition authorities at both sides of the Atlantic have not managed yet to define clear standards that would enable them to distinguish between legitimate settlements of an IP dispute and those that would infringe competition law.

505 In re Cardizem CD Antitrust Litig., p. 908.

506 See, http://www.americanbar.org/publications/preview_home/12–416.html

507 EU Guidelines on Transfer of Technology Agreements (n 106) para. 209; Case 193/83 Windsurfing International v Commission [1986] ECR 611. In contrast, trademark delimitation agreements are dealt as classic market sharing agreements: see, Case 35/83 BAT Cigaretten-Fabriken GmbH v Commission [1985] ECR 363.

508 In the Citolopram case, Lundbeck and several generic competitors were accused to have entered into agreements which may have hindered the entry of generic citalopram into markets in the EU: http://europa.eu/rapid/press-release_IP-12–834_en.htm. In the Perindopril case, the Les Laboratoires Servier and several generic competitors were accused to have entered into agreements which may have hindered the entry of generic perindopril into the EU. See also, the recent (April 19, 2013) statement of objections sent by the UK Office of Fair Trading (OFT) to GlaxoSmithKline (GSK), following its investigation into patent litigation settlement agreements (PLSAs) in the pharmaceutical sector. The underlying factual complaint related to GlaxoSmithKline's alleged conduct in defence of one of its blockbuster drugs, Seroxat, which is a prominent anti-depressant (paroxetine), in particular the PLSAs it concluded with three generics companies (pay for delay): http://oft.gov.uk/news-and-updates/press/2013/36–13

509 Draft Proposal for Revised Guidelines of the European Commission on Transfer of Technology Agreements, available at <http://ec.europa.eu/competition/consultations/2013_technology_transfer/guidelines_en.pdf> para. 223, last accessed 28 April 2013.

IV. EXHAUSTION (FIRST SALE)

While patents produce dynamic benefits by encouraging innovation, they also produce allocative inefficiencies.[510] An exclusive right holder seeking to maximize returns will tend to raise prices over the competitive price and decrease output. This produces a deadweight loss, in that there are potential consumers who forego purchase at the "monopoly" price even though they could put the invention to good use (and thus, raise social welfare). The patentee does not make the sale, and thus earns less than the full potential return. The exhaustion (first sale) doctrine mitigates the first problem. Once a patentee sells an embodiment of the invention (or authorizes such a sale), his interest in that embodiment is deemed to be exhausted. The buyer can resell, creating a secondary market where goods are available at lower cost. Those who would not pay the original price can purchase in the secondary market and enjoy the benefit of the invention. The first sale doctrine is also said to fulfill purchasers' expectations in that it limits restraints on alienation.

There are, however, numerous problems with the first sale doctrine. First, exhaustion does not fully mitigate the first problem. Instead, it can increase the patentee's loss in that the secondary market can compete with the primary market for the patentee's products. This exerts a downward pressure on price and reduces incentives to innovate. Patentees thus prefer to deal with deadweight loss by segmenting markets and charging differential prices, depending on what that market can pay. The first sale doctrine interferes with this strategy because buyers can purchase in the low-cost segment of the market and resell to the high-cost segment. In particular, patentees use international boundaries for this purpose. As a result, prices in some countries will be significantly lower than prices in other countries. Patentees do not believe that their interest in selling where the price is high is "exhausted" by sale where the price is low.

Patentees also have other interests in the fate of the embodiments they sell. Some products are dangerous if not refurbished correctly. In these cases, the patent holder needs to control resale in order to assure quality (and protect itself from tort liability). Some products, particularly in the agriculture and software sectors, are self-replicating; if their reuse cannot be controlled, the primary market can be entirely destroyed. Thus, in *Bowman v. Monsanto*, the Supreme Court held that the sale of one generation of seed does not exhaust rights on later generations: a farmer who purchased seed to grow could not sow a new crop using seeds produced by the first crop - that, the Court held, would constitute making the patented product and not reusing or selling the seed that had been produced. Finally, in parts of the IT sector, products are brought to market through value chains, starting with manufacturers of components and moving to fabricators, distributors and retailers. Because there are differing arrangements among the members of the chain, participants need to control sales as their products move along the chain.

Because the arguments both for and against exhaustion are so strong, the TRIPS Agreement did not take a position on this issue, except to say that WTO members are bound by the national treatment and most favoured nation provisions (arts. 6, 3, & 4). Thus members are free to define the limits of exhaustion as they see fit and to allow patent holders to mitigate the cost of the doctrine contractually. They cannot, however, regard sales as exhausting foreign right holders' interests in circumstances where they would not regard national right holders' interests as exhausted.

1. Defining First Sale

In defining the scope of first sale, the first question is what constitutes a sale. While it is not entirely clear from TRIPS, exhaustion is generally thought to apply only to voluntary sales by the patent holder. However, it is arguably also applicable to sales made under a compulsory license (and subject to royalty payments to the patentee). Some countries also view any lawful sale – such as sales in countries where the invention is not patented – as subject to the doctrine. It remains unclear whether definitions that do not involve voluntary sales are consistent with TRIPS. Significantly, when the WTO decided to expand the use of compulsory licenses during the Doha Round, it took steps to ensure that the medicines produced under the license do not find their way into the right holder's principal markets (in other words, such sales are not considered subject to exhaustion).

Harder is the question of where the sale must take place. Virtually every country regards sales within its territory as within the exhaustion doctrine (subject to the exceptions discussed below). However, countries take radically different positions on sales outside their territory. The United States' position on international exhaustion (parallel importation) has been in flux for some time. In a very recent case, Kirtsaeng v Wiley, the Supreme Court held that sales of copyrighted works outside the United States are subject to exhaustion.[511] Thus, a student was permitted to buy copies of textbooks in Thailand at a low price, resell them in the United States at a higher price, and pocket the difference. In contrast, the Federal Circuit has held that there is no international exhaustion of patented products and processes, but that was before the Supreme Court decided Kirtsaeng.[512]

The EU has taken an intermediate position: sales within the EU (Community exhaustion) are subject to exhaustion, but sales outside the EU (international exhaustion) are not. In Silhouette, the Court of Justice found that an Austrian rule providing for exhaustion of trade-mark rights in respect of products put on the market outside the European Economic Area ("the EEA") under that mark by the right holder or with his consent was

510 On the complex economics of parallel trade, see Keith E. Maskus, *Private Rights and Public Problems – The Global Economics of Intellectual Property in the 21st Century* (Peterson Institute for International Economics, 2012), pp. 172-188.

511 Kirtsaeng v. John Wiley & Sons, Inc.,-- S.Ct.-- (March 19, 2013).

512 Jazz Photo Corp. v U.S., 439 F.3d 1344 (Fed. Cir. 2006).

contrary to Community legislation relating to trade marks.[513] Exhaustion occurs only where the products have been put on the market in the EEA and, in presence of complete harmonisation of the rules relating to the rights conferred by a trade mark, Member States cannot provide in their domestic law for international exhaustion of the rights conferred by a trade mark in respect of goods put on the market in non-member countries.[514] With regard to sales inside the EU, the Court of Justice has established two conditions for the exhaustion of the distribution right of the third party purchaser to resell the IP protected work in another Member State without the risk of infringement: (i) the goods should be placed on the market and sold, so as for the holder of the IP right to realize the economic value of the right, (ii) the holder of the IP right must have consented to the goods being put on the market within the EEA.[515] Consent is presumed if the intellectual property rights holder and the first sale distributor are under common control or linked economically or when there is a voluntary grant of a license. However, this is not the case if the goods have been put on the market in breach of a license condition designed to protect the reputation of the right holder or when the goods are produced under a compulsory license.[516] With regard to imports coming from outside the EEA, in Davidoff the Court held that "consent must be so expressed that an intention to renounce those rights is unequivocally demonstrated" or "it may, in some cases, be inferred from facts and circumstances prior to, simultaneous with or subsequent to the placing of the goods on the market outside the EEA which, in the view of the national court, unequivocally demonstrate that the proprietor has renounced his rights".[517] The trader should thus demonstrate that the right holder consented to the marketing of the product, the silence of the right holder being not a sufficient element to infer the existence of consent.[518] Furthermore, EU law recognizes the right holder's right to protect its reputation from any modification of its work, or from a risk of confusion of the consumers on the genuine origin of the product or passing-off, even after a first sale.[519]

As suggested by the position taken by the TRIPS Agreement, there is substantial disagreement on which view of international exhaustion is better from a public welfare perspective.[520] A strong exhaustion doctrine advances the interests of each country's own consumers because they potentially have access to cheaper goods from abroad. However, the advantage to consumers comes at the expense of the patent holder's interest in maximizing its return. Thus, it reduces incentives to innovate. In the long run, a strong exhaustion doctrine can also harm the citizens of poorer countries where the product is protected. The right-holder may refuse to sell in those markets to avoid the backflow of goods. Or the right holder may set the price based on global demand. Thus, prices will rise in poor countries and fall in rich countries. For example, now that it is clear that books sold in Thailand can be imported into the United States, the publisher may well raise the Thai price. The deadweight loss in Thailand will rise as fewer Thai consumers can afford to buy the texts at the international price. In short, the impact of the exhaustion doctrine on welfare depends on whether one is interested in consumer welfare, producer welfare, overall national welfare, or overall global welfare.

2. The Role of Contracts (Licensing to Avoid First Sale)

Right holders often attempt to mitigate the effects of the exhaustion doctrine contractually. For example, in Kirtsaeng, the books were marked as for sale outside the United States. Patentees also try to advance other interests through restrictive licenses. Thus, in Mallinckrodt v Medipart, a medical device used to deliver radioactive material was marked "single use only" with the goal of preventing refurbishment and resale.[521] In Quanta Computer v LG Electronics, a value-chain licensing case, LGE licensed Intel to manufacture and sell microprocessors and chipsets that used LGE's patents, but the deal made clear that no license "is granted by either party hereto … to any third party for the combination by a third party of Licensed Products of either party with items, components, or the like acquired … from sources other than a party hereto, or for the use, import, offer for sale or sale of such combination."[522] Similarly, those holding utility patent rights in seed sell subject to a contractual provision that bars the farmer from saving seed and using it to grow another generation of crops.[523] When these provisions are violated, the exhaustion doctrine may bar infringement actions. However, acts in violation of these licenses may be regarded as breaches of contract.

Courts in the United States have, however, had a difficult time deciding whether these license provisions should be enforced. If the first sale doctrine is an important limit on the patent holder's rights, or if the doctrine is considered crucial to the public interest, then the patent holder should not be permitted to override the limitations contractually. The Su-

513 Case C-355/96 Silhouette International Schmied GmbH & Co. KG v Hartlauer Handelsgesellschaft mbH [1988] ECR I-4799 interpreting Article 7 of Directive 2008/95 to approximate the laws of the Member States relating to trademarks [2008] OJ L299/25.

514 The Court, however, noted that the EU authorities could always extend the exhaustion provided for by Article 7 to products put on the market in non-member countries by entering into international agreements in that sphere, as was done in the context of the EEA Agreement.

515 See, for instance, for trademarks Article 7 Directive 2008/95 to approximate the laws of the Member States relating to trademarks OJ [2008] L 299/25.

516 For analysis, see Oke Odudu, 'Intellectual Property Rights' in Bellamy and Child: European Union Law of Competition (Oxford University Press 2013), Ch 9, pp. 682–687.

517 Joined cases C-414 & 416/99 Zino Davidoff and Levi Straus [2001] ECR I-8691, paras 45–46.

518 See, also Case C-244/00 Van Doren + Q [2003] ECR I-3051 (on the question of the concrete allocation of the burden of proof for the exhaustion objection in a trade mark infringement proceeding).

519 See, for instance, Case 119/75, Terrapin v Teranova [1976] ECR 1039. Some case law of the Court of Justice has also examined if re-packaging of medicinal products affects the reputation of the trade mark holder: see, for instance, case C-143/00 Boehringer Ingelheim (No. 1) [2002] ECR I-3759.

520 For an empirical study of parallel import restrictions in the copyright context, see Australian Government, Productivity Commission Report, Restrictions on the Parallel Importation of Goods (2009).

521 Mallinckrodt, Inc. v Medipart, Inc., 976 F.2d 700 (Fed. Cir. 1992).

522 Quanta Computer, Inc. v LG Electronics, Inc., 553 U.S. 617 (2008).

523 Monsanto Co. v Bowman, S. Ct. (May 13 2013).

preme Court has hinted that it subscribes to this view. Thus the legend in Kirtsaeng limiting sales to regions outside the United States did not figure into the Court's decision – it allowed the books to be resold in the United States. In Quanta, the Supreme Court held that the license could not be used to limit the rights of fabricators to utilize purchased components as they wished.

On the other hand, the Supreme Court appeared to have granted certiorari in Bowman v Monsanto, the case about patented seeds, to reconsider whether restrictive licenses are enforceable. However, it did not reach the issue once it decided that growing a second crop constitutes "making" rather than "using" or "selling".[524] It is thus possible that the Court will permit contractual overrides to the first sale doctrine when the restriction is clear to the party against whom the contract is being enforced and/or when the restriction has an important public purpose. Thus, in Quanta, the Court may not have understood the need for the restriction. Furthermore, the license was confusing: after limiting the right to use the components sold, it stated that "[n]otwithstanding anything to the contrary contained in this Agreement, the parties agree that nothing herein shall in any way limit or alter the effect of patent exhaustion that would otherwise apply when a party hereto sells any of its Licensed Products". As a result, buyers may have lacked adequate notice of the restriction. Furthermore, the Court may have thought that in that particular case, the provision was anticompetitive – that the exhaustion doctrine enhanced competition among fabricators and distributors. In contrast, in the medical device case, the Federal Circuit found the "single use only" restriction was clear to purchasers and crucial for quality control purposes (that case did not go to the Supreme Court). As noted above, courts in the EU have taken an intermediate position on the significance of the right holder's consent.

SUMMARY. The social welfare effects of the exhaustion doctrine are indeterminate. The doctrine benefits consumers and downstream manufacturers. However, these benefits may be offset by diminished incentives to innovate. In international cases, the benefits may also be offset by subsequent price adjustments by the patentee. In cases where there is a clear social benefit to limiting resale – such as to protect quality, safeguard health, or prevent self-replication – courts have proved somewhat willing to enforce contractual restrictions. But because the doctrine protects the expectation interests of purchasers, buyers must have adequate notice of restrictions prior to purchase.

524 See *Bowman*.

V. GOVERNANCE ISSUES

A. Improving the Governance of the Intellectual Property System

For the most part, copyright and trademark governance is considered rather straightforward. Copyrights arise automatically. Registration, if it is required at all, is essentially a ministerial act. In the United States, it is carried out by the Copyright Office, an agency within the Library of Congress. Enforcement is in the courts of general jurisdiction.

In the United States, federal trademark cases, however, are more complicated because registration is necessary to acquire full federal trademark protection and the application requires examination (state marks can be acquired through use and enjoy certain federal rights as well). Federal registration is handled by the Patent and Trademark Office (the USPTO). The Manual of Trademark Examining Procedure guides its work. The USPTO has a special appeal tribunal, the Trademark Trial and Appeals Board, to hear appeals from denials of registration. Appeals from the USPTO are usually heard in the United States Court of Appeals for the Federal Circuit. As with copyrights, enforcement actions are heard in courts of general jurisdiction.

Patent rights are more complicated still. The USPTO handles examination, using the Manual for Patent Examining Procedure (MPEP). As with trademarks, there is an adjudicatory tribunal within the agency – the Patent Trial and Appeal Board (PTAB) –and appeals from there are usually heard in the Federal Circuit. Enforcement of patents is in trial courts of general jurisdiction, but appeals are channeled to the Federal Circuit.

In all these cases, the losing party has a right to petition for review in the United States Supreme Court. However, the Supreme Court enjoys the right to decide which petitions to grant. Historically, it has granted review in very few intellectual property cases.

For trademarks and patents, the EU system is quite different. Copyrights are national rights. However, the EU has issued a series of directives on copyright term, rental rights, database rights, rights over the internet, and other matters which all EU counties must implement. All of the countries of the EU maintain their own patent and trademark offices and the national rights that emanate from these offices are dealt with in national courts. In addition, the EU recognizes a Community Trademark, which is examined in the Trade Marks and Designs Registration Office of the European Union and litigated in national courts. Finally, the countries of the EU are members of the European Patent Convention (EPC), which also includes many countries that are not in the EU. An EPC patent is examined in the European Patent Office (EPO). After a period when it can be centrally challenged in the EPO, the patent matures into patent rights in each of the EPC countries designated by the right holder. At that point, enforcement is in national courts. The EU is currently contemplating the development of a Unitary Patent, which would be examined in the EPO and enforced in a set of specialized courts. For all regimes, questions on interpreting EU law are ultimately for the Court of Justice of the European Union (the ECJ).

Governance issues arise mainly in connection with patents, which involve a complicated legal regime applied to technologically complex material. As new technological prospects emerge, the law must be adapted to meet the needs of industry and the public. Incorrect decisions are also extraordinarily costly. The failure to grant patents can inhibit innovation. But overgranting puts a tax on innovation, raises transaction costs prohibitively, attracts non-practicing entities, and induce holdups. Because the situation in the EU is complicated by the separate authorities of the EPC and the EU, governance issues will be discussed through the lens of the US system.

1. The Role of the USPTO

As noted above, initial decisions on patentability are made by a specialized agency. The USPTO is composed of a corps of examiners trained in the art they examine. The administrators of the USPTO guide their practice, in part through supervision of decisions and review in the PTAB, in part through the MPEP, and in part by writing guidelines on areas of particular importance. For example, the USPTO is currently working on guidelines for claiming software, with the goal of requiring claims and disclosure that are more focused and less indeterminate. When developing these rules, the USPTO generally announces its proposal and then holds a series of hearings around the country to give interested parties an opportunity to comment. Written comments can also be sent directly to the USPTO. The “notice and comment” procedure is reiterative, until the USPTO issues its final guidelines.

In the United States, most regulatory agency rulemaking is entitled to substantial deference, on the theory that the agency is composed of experts in the field they are regulating. For historical reasons, however, the USPTO has never received rulemaking authority, except for matters related to practice before the PTO (such as attorney qualifications).[525] While it can make rules to guide examination, most of the rules the USPTO develops are not entitled to formal deference in court. Similarly, while the Office of Information and Regulatory Affairs (OIRA) performs a cost-benefit analysis on all agency actions that are legislative in nature, most USPTO rules are not legislative and are therefore have not traditionally been subject to review. That said, as patent issues have become more salient in the economy, OIRA has begun to take notice. It has statutory authority to conduct cost-benefit analysis of "significant" rules, even if not legislative and has begun to do so with regard to certain intellectual property issues, such as government approaches to standard-setting involving patented standards. More controversially, since 1999, OIRA has also asserted the authority to review any rule with an impact

525 The scope of this authority remains somewhat ill-defined, see, e.g., Tafas v. Doll, 559 F. 3d 1345 (Fed. Cir. 2009).

of over $100 million or that creates a serious inconsistency or otherwise interferes with an action taken or planned by another agency.[526] Thus, it could begin to review more USPTO actions. OIRA is, however, a small agency; the extent to which it will have the capacity to scrutinize the USPTO's actions remains unclear.

To some extent, the degree of deference given the USPTO by courts may also change. The latest patent statute, the America Invents Act (AIA),[527] vests new adjudicatory authority in the USPTO. While the agency's Board has always heard appeals from patent rejections, and has had limited capacity to reexamine patents when new prior art has been found, it will now entertain post grant review, allowing interested members of the public to oppose patent grants for the first nine months after issuance (this procedure will be similar to the opposition procedure in the EPC).[528] In addition, the Board will entertain inter partes actions in certain types of cases.[529] These procedures will give the USPTO a broader perspective on patents and on their impact on competition and innovation. In addition, the USPTO now has a Chief Economist who is charged with conducting research on patent issues as they arise.[530] Most important, the UPTO will acquire the authority to set its own fees. As a result, it will no longer be in a position where it is forced to issue patents to support its operations.[531] Finally, the USPTO is establishing satellite offices near technology centers (for example, Detroit, home of the automobile industry; Silicon Valley, home of the IT industry; and Dallas, home of the petroleum industry). Examiners in these locations are likely to become highly expert in the technologies of the local industries and especially aware of these industries' needs.

As a result of these new capacities, institutions, and procedures, there is an expectation that the rules developed by the USPTO will be accorded more respect, if not official deference. Furthermore, because the new inter partes procedure is cheaper and faster than adjudication, the USPTO may become the preferred venue for litigation (indeed, trial judges may suspend adjudication of cases pending USPTO determination of the validity of relevant patents). Because the USPTO's decisions are entitled to res judicata effect, the USPTO's views may, as a practical matter, become the final disposition in many future cases.

526 See, e.g., Office of Management and Budget, Office of Information and Regulatory Affairs Q & As, http://www.whitehouse.gov/omb/OIRA_QsandAs (discussing Executive Order 12866 and amendments); OMB Circular A-119, http://www.whitehouse.gov/omb/circulars_a119 last accessed 28 April 2013.

527 Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. (US) 284 (2011).

528 35 U.S.C. §§321–329.

529 35 U.S.C. §§311–319.

530 For the research agenda and reports of the Chief Economist, see <http://www.uspto.gov/ip/officechiefecon/> last accessed 28 April 2013.

531 For evidence that the previous fee structured distorted granting behavior, see Michael D Frakes and Melissa F Wasserman, 'Does Agency Funding Affect Decisionmaking? An Empirical Assessment of the PTO's Granting Patterns (2013) 66 Vanderbilt Law Review 67; Robert P Merges, 'As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform' (1999) 14 Berkeley Technology Law Journal 577, 589-91.

2. The Role of the Courts

Until 1982, courts of general jurisdiction ultimately developed patent law through litigation: a special court, the Court of Claims and Patent Appeals (CCPA) heard appeals from the USPTO; regional trial courts heard enforcement actions at the first instance; and the US regional circuits heard appeals from the trial courts. This led to three problems. First, because the courts of appeals are not bound by each other's decisions, notorious differences developed between the law applied in examination – which was developed by the CCPA – and the law applied by regional trial and appeals courts in litigation. Second, the regional courts of appeals had each adopted different views on patents, leading to intense levels of forum shopping among them. Third, generalist judges did not always interpret the law in a manner consistent with optimal levels of innovation. Supreme Court intervention was regarded as too infrequent to solve these problems.

In 1982, the Federal Circuit was created to hear a range of cases, including all appeals from the USPTO and all federal trial court cases in which the plaintiff's claims arise under the patent act.[532] As a result of channeling almost all federal patent cases to a single court, it was assumed that the notorious differences would disappear, as would forum shopping. In addition, the Federal Circuit was expected to build considerable expertise in patent law – that is, to provide the expert perspective that the USPTO could not, as a historical matter, furnish.

Views on the Federal Circuit's performance are somewhat mixed. The patent bar is very pleased with the court. Practitioners believe the law is more predictable and uniform across the nation. Adjudication is also more efficient and open issues are resolves relatively speedily. Empirically, patent filings have increased as the Federal Circuit has made patents more secure. Indeed, the Federal Circuit's popularity among practicing patent lawyers bar has led many other nations to create specialized patent (or specialized intellectual property) courts as well.

At the same time, there is reason for concern. First, much of the complexity in patent cases arises in the factual part of the case (figuring out the facts or applying the law to the facts). But fact-finding is the province of the trial court; courts of appeals review fact finding very deferentially; it is only legal conclusions that are reviewed de novo. In order to better super-

532 See 28 U.S.C. §1295 (providing for jurisdiction over appeals of regional adjudication of all patent disputes and certain tort cases brought against the United States; of decisions of the Court of Federal Claims and the Court of International Trade; of certain decisions of the International Trade Commission; of decisions of the Merit Systems Protection Board; of certain tax decisions from the courts of the Canal Zone, Guam, the Virgin Islands, and Northern Mariana Islands; of dispute resolution under the Contract Disputes Act and various economic measures, including the Harmonization Tariff Schedule, the Economic Stabilization Act, the Emergency Petroleum Allocation Act, the National Gas Policy Act, and the Energy Policy Conservation Act; and of certain agency action under the Federal Labor Relations Authority, the Patent Act, and the Lanham (Trademark) Act). See generally, Rochelle C Dreyfuss, 'The Federal Circuit: A Case Study in Specialized Courts' (1989) 64 New York University Law Review 1 (1989).

vise the lower courts, the Federal Circuit has deemed many factual questions to be questions of law and it has tended to impose rigid, bright line rules to make it easier for the generalist judges to apply the law to the facts. But both moves have been severely criticized. For example, claim construction is considered a legal issue. As a result, a trial court will construe the claim, hear the rest of the case, and reach final decision – only to find that the Federal Circuit has reversed the claim construction. At that point, the entire case may have to be retried. Further, many of the Federal Circuit's bright line rules have been reversed by the Supreme Court as overly rigid.[533]

Better might be to create expert trial courts. Channeling all cases to a single set of trial courts would produce judges with greater facility to read technical materials. With better acquaintance with the somewhat arcane rules of patent law, these judges would become more likely to make accurate factual decisions. In fact, some countries are experimenting with expertise at the trial level. To some extent, the United States is as well. A new pilot program allows each trial court to designate judges to hear patent cases.[534] Cases will be distributed randomly among the judges of the court, but any judge assigned a patent case can have it reassigned to the designated judge. So far, judges in fourteen district courts have volunteered to become designated judges. It remains to be seen how many cases they hear, how expert they grow, and whether the Federal Circuit becomes less prone to reverse their decisions.

A second critique of the Federal Circuit is that it is overly enamored of patents as a means of promoting innovation. As noted above, the court has jurisdiction over issues other than patent law. However, it hears almost no competition law case or cases arising under other intellectual property laws. Because it tends to see patents as the sole means of promoting invention, its decisions have largely expanded the prerogatives of patentees at the expense of the public, including competitors. It is difficult to know whether this concern is valid, but the Supreme Court appears to think so. In recent years, it has stepped up its review of Federal Circuit cases and for the most part, it has reversed or otherwise modified the Federal Circuit's decisions. As described in Part II, it has repeatedly reversed the Federal Circuit on what constitutes patentable subject matter,[535] it has raised the inventive step,[536] emphasized the equitable nature of injunctive relief,[537] and expanded the exhaustion doctrine.[538] It has also stretched the Bolar research exemption to cover some preclinical work[539] and expanded standing to challenge patent validity.[540] Of course, it is possible that the Supreme Court, which is composed of generalists, has it wrong and the specialists on the Federal Circuit have it right. For that reason, some countries have considered specialization at both the trial and appellate level. However, any system that sees competition as a strong motivator of innovation should consider the Federal Circuit experience and be wary of overspecialization.

SUMMARY. At the end of the day, the better option may be to repose legal expertise (power to interpret patent law) in the patent office, rely on specialized trial courts with technical expertise to implement the law in specific cases, and permit review by generalist appellate courts. The appeals court would be highly deferential to patent office rules, but would be available to consider how patent law interfaces with competition policy, the public interest, and innovation policies that derive from other legal regimes.

B. Improving the Interaction Between Competition Law and IP Law

There are various ways to improve the interaction between competition law and IP law.

First, one may conceive some cross-fertilization between the two fields from a substantive law perspective. Competition law may internalize IP values, such as the promotion of incentives to innovate in competition law enforcement. The call for competition law to move towards a more dynamic analysis that focuses on innovation, instead of static allocative efficiency, encapsulates the view that both disciplines should find some common ground, although for competition authorities the starting point remains the assumption that competition promotes growth and innovation.[541] IP law may also internalise competition law values by focusing on access and dissemination. We have previously explained the various doctrines of IP law enabling access and dissemination concerns to be taken into account (e.g. the experimental use exception, decompilation of parts of a software product, compulsory licensing, patent misuse doctrine). A recent report by the US FTC has also suggested the possibility for the Patent Office (PTO) to "consider possible harm to competition along with other possible benefits and costs, before extending the scope of patentable subject matter".[542] The Report also noted the necessity of expanding the consideration of economic learning and competition policy concerns in patent law decision-making. These recommendations insist on the importance of trans-disciplinary links between IP and com-

533 Rochelle C. Dreyfuss, 'What the Federal Circuit Can Learn From the Supreme Court – and Vice Versa' (2010) 59 American University Law Review 787.

534 United States Courts, The Third Branch News, District Courts Selected for Patent Pilot Program (7 June 2011) available at http://www.uscourts.gov/News/NewsView/11–06–07/District_Courts_Selected_for_Patent_Pilot_Program.aspx accessed 28 April 2013.

535 Mayo Collaborative Services v Prometheus Laboratories, Inc., 132 S. Ct. 1289 (2012); Bilski v Kappos, 130 S. Ct. 3218 (2010).

536 KSR Int''l Co. v Teleflex Inc., 550 U.S. 398 (2007).

537 eBay, Inc. v MercExchange, L.L.C., 547 U.S. 388 (2006).

538 Quanta Computer, Inc. v LG Electronics, 553 U.S. 617 (2008).

539 Merck KGaA v Integra Lifesciences I, Ltd., 545 U.S. 193 (2005).

540 MedImmune, Inc. v Genentech, Inc., 549 U.S. 118 (2007).

541 See, OFT 1390, Competition and Growth (November 2011) (noting the "wide range" of empirical studies examining the links between competition, innovation and productivity, which set, on the whole, a positive relationship between the three and at the micro level, examples of the positive impact of specific competition interventions on price, choice and innovation, which are "abundant").

542 US FTC, 'To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy (October 2003)) available at <http://www.ftc.gov/os/2003/10/innovationrpt.pdf> last accessed 28 April 2013, Recommendations 6 and 10.

petition law and confirm the thesis that intellectual property and competition law have become or are in the process of becoming a "unified field".[543]

The integration of social science/economics learning in IP decision-making and adjudication remains however relatively marginal, in comparison to competition law. In the US, the PTO does not dispose of a rule-making function over questions of patentability, its authority being merely confined to the adjudication of disputes of patent validity. Certainly, the 2011 America Invents Act has conferred to the US PTO also the ability to conduct post grant review proceedings, available for a limited period of nine months after a patent was granted or re-issued, a process overseen by the Patent Trial and Appeal Board, but did not confer upon it any rulemaking authority. Courts, in particular the Federal Circuit, have generally been regarded as the dominant institution in the shaping of patent policy in the US.[544] Yet, both the US PTO and the Federal Circuit lack economic expertise and are unable, under the current circumstances, to perform a sophisticated economic analysis of the effect of their activity on innovation, productivity and welfare. Responding to this concern over the lack of economic expertise, the US PTO established in March 2010 the Office of the Chief Economist (OCE), whose function is to initiate and oversee economic analysis in the field of intellectual property protection and enforcement and to feed into the advisory role of the USPTO to the President (via the Secretary of Commerce) and the administration with advice on the economics of intellectual property rights.[545] The research programme set for the first chief economist related to macro-economic type of research on the relationship between economic growth, performance and employment, IP issues in a standard setting context, the economics of trademarks, the economics of the USPTO process and the role of IP in the markets of technology and knowledge. A report on Intellectual property and the US Economy, focusing on specific "IP intensive" industries was published in March 2012.[546] It is not however clear if the position of the chief economist at the US PTO will evolve to a more permanent position with a more expansive role and intervention in the adjudicative process. This paucity of economic analysis contrasts with the very active role economists have been playing in the academic debates over economic analysis of IP rights.

In Europe, the integration of economic expertise seems more advanced, at least at the institutional level. The European Patent Office (EPO) established the position of a chief economist already in 2004. The chief economist is the executive secretary of the EPO's Economic and Scientific Advisory Board (ESAB), an institution created in 2011 and composed of 11 patent experts (a mix of economists, social scientists and practitioners), appointed for a period of three years.[547] The Board advises the EPO on the scope and set-up of relevant economic and social studies, provides guidance on related research projects and evaluates their impact. One of the first studies published by ESAB, for example, was on patent thickets, an issue of great concern also for competition law, as we have previously explained. ESAB is also expected to provide "early warning signals" on sensitive developments and issues and to operate as a platform for discussing the role of patents (applications) in the early stage of the innovation process and during application procedures at the EPO, the governance of the patent system and economic and social issues relating to the impact of patents after grant, such as "competition matters". The two first chief economists of the EPO have also published one of the few books in Europe on the economic analysis of the European patent system, integrating a competition perspective.[548]

The Hargreaves report in the UK identified the lack of economic analysis as one of the major sources of the failure of public policy in this area and the lack of evidence-based policy-making, a point also frequently made in the past by other reviews of the IP system in the UK.[549] Following proposals in 2006 by the Gowers Review, the UK government put in place in 2008 the Strategic Advisory Board for Intellectual Property (SABIP) with the aim to oversee a number of research projects on IP policy topics. However, the SABIP was not part of the IPO and did not contribute to the mainstream IP policy process in any area, resulting to its disbandment in 2010.[550] The Gowers report also led to the appointment of the first chief economist of the IPO in 2008 and the development of an IP economists unit [Economics, Research and Evidence (ERE)], to which some policy staff who have previously worked for the SABIP were integrated, thus shifting attention upon the economic aspects of IP.

The Hargreaves report also included a number of recommendations with the aim to "broaden the IPO's vision" and to base IPO's decision-making in evidence and the obligation to "take due account of the impact of the IP system on innovation and growth".[551] The Hargreaves report recommended legislative changes that would add new functions to the IPO including (i) "a duty to keep under review the impact of IP and IPRs, and market positions founded on IPRs, on innovation and growth, including adverse impacts on competition and the competitive spur to growth, and to

543 W.K. Tom & J A. Newberg, 'Antitrust and Intellectual Property: From Separate Spheres to Unified Field' (1997) 66 Antitrust Law Journal 167.

544 A. Rai, 'Patent Validity Across the Executive Branch: Ex Ante Foundations for Policy Development' (2012) 61 Duke Law Journal 101 (noting also the increasingly important involvement of the Supreme Court in the area); Rochelle C Dreyfuss, 'What the Federal Circuit Can Learn from the Supreme Court – And Vice Versa' (n 534).

545 See, <http://www.uspto.gov/ip/officechiefecon/> last accessed 28 April 2013.

546 See, <http://www.uspto.gov/news/publications/IP_Report_March_2012.pdf> (the report use standard statistical methods to identify which US industries are the most patent-, trademark-, and copyright-intensive, and defines this subset of industries as "IP-intensive).

547 See, http://www.epo.org/about-us/office/esab.html last accessed 28 April 2013.

548 Dominique Guellec and Bruno van Pottelsberghe de la Potterie, The Economics of the European Patent System: IP policy for innovation and competition (Oxford University Press 2007).

549 Hargreaves (n 20) 91, "(e) ven where IP law is clear it is too infrequently grounded in evidence or directed to take account of economic priorities. This represents a failure of public policy" and p. 92, noting that the Banks Review in the 1970s "deplored the lack of evidence to support policy judgments" and that "(t) hirty years later, the Gowers Review in 2006 made the same point", concluding that "our institutional framework appears to have failed to equip itself to conduct evidence-based policy effectively".

550 Ibid 92.

551 Ibid 95.

report annually"; (ii) "powers to prepare one off reports on specific areas or cases where there appears to be detriment to competition and consumer welfare"; (iii) "powers to require information to support the exercise of these reporting functions"; (iv) "powers to make recommendations to the competition authorities, and to fund investigations that competition authorities may make as a result, thereby recycling income from fees paid by rights holders in the interests of maintaining healthy and efficient markets, as well as servicing the needs of rights holders and applicants".[552]

Following the Hargreaves Report, the IPO was also asked to issue an annual report on the extent to which its activities have promoted innovation and growth, and, second, to improve its evidence base for policy making, in view of its rule-making functions and in particular to prepare impact assessments quantifying, if possible, the costs of policy changes and integrating in the published impact assessments a summary statement of the impact of the proposed policies on innovation and growth.[553] It remains to be seen how these additional requirements will affect the activity of the IPO and the integration of economic learning.

A similar trend for more economic analysis in the IP offices can be observed in other jurisdictions. There are also economists in INPI Brazil, IP Australia, the Canadian office, OHIM, an observator including economists at INPI France, the Swiss IP office and even in CIPO China. Furthermore, offices in Japan and Germany have close links to academic institutions which are almost as effective in terms of influence. WIPO has also recently strengthened its capability on both economics and statistics. In comparison, the integration of social science research and economic expertise is particularly developed in the area of competition law. In the US, a significant part of the staff of the Antitrust Division of the Department of Justice and the FTC dispose of economic expertise and economists are particularly present in both the adjudicative and the rule-making functions of the authorities. At the FTC, the Bureau of Economics provides economic analysis and support to antitrust and consumer protection investigations and rulemakings. In the EU, a Chief Competition Economist' (CCE) office, was established in 2003, comprising a team of specialized economists, headed by a Chief economist who is appointed by the European Commission. The CCE's office fulfills a "support function", being involved in competition investigations and providing economic guidance and "methodological assistance", but also exercises a "checks-and balances" function, giving the Commissioner an "independent opinion" before any proposal for a final decision to the College of Commissioners.[554] The Chief economist also coordinates the work of the Economic Advisory Group on Competition Policy (EAGCP), which regroups a number of academic economists who have recognized reputation in the field of industrial organization, proposed by the chief economist and nominated by the Commissioner. The EAGCP prepares opinions on the projected reviews of EU competition law policies and regulations. The Commission's appointment of a Chief Economist reflects its responsiveness to changes in intellectual climate and economic theory. Many national competition authorities have followed the same path by appointing chief economists and by either establishing specific bureaus of economics or by integrating economists in the different case teams dealing with investigations.

A common emphasis on the economic effects of each policy on welfare and innovation may reduce the tensions between these two areas of law. Yet, there are limits as to what economic analysis may offer for the development of a congruent approach to innovation across both fields. The IP system relies on a single set of rules that apply to all industries with relatively minor deviations, which is the result of the choice to limit administrative costs and ensure economies by making rules more general.[555] Defining the optimal scope of the property rights on a case by case basis, taking into account its probable effect on innovation and welfare, might largely exceed the capacities of government authorities in charge of the development of IP law and might be extremely costly, in view of the number of patent applications (to give that as an example) and the limited amount of information at their disposal at the time of the grant of the patent. Empirical studies on the effect of different IP rights on the level of innovation per industry are scarce and not always conclusive. The best that can be done under the current institutional circumstances is to make efforts to integrate economic analysis in the design of optimal IP law regimes and rules, rather than in enforcing the standards of patentability, as it was suggested by the FTC. At the same time, the focus of the economic analysis might be different in the context of an IP office than in that of a competition authority. Although competition authorities increasingly recognize the important of dynamic analysis and the objective of innovation, they cannot completely abandon static analysis of the effects of a practice on consumers, the latter being considered particularly important if the aim of competition law is to protect consumers from wealth transfers, in the absence of compensating qualitative efficiencies[556]. Competition law and IP agencies dispose of different types of expertise and functions, which are nevertheless complementary, as they enable achievement of dynamic efficiency at the lowest cost for allocative efficiency. There are thus reasons to avoid any significant duplication of tasks between the competition law and the IP authorities. There has nevertheless been some discussion over the integration of the different functions

552 Ibid.

553 IPO, The Role of the Intellectual Property Office (July 2012) available at <http://www.ipo.gov.uk/hargreaves-roleofipo.pdf>; IPO, Response to the Informal Consultation on the Role of the Intellectual Property Office (March 2013) available at <http://www.ipo.gov.uk/response-2013-roleipo.pdf> last accessed 28 April 2013.

554 Lars-Hendrik Röller and Pierre A Buigues, 'The Office of the Chief Competition Economist at the European Commission' (May 2005) available at <http://ec.europa.eu/dgs/competition/economist/officechiefecon_ec.pdf> last accessed 28 April 2013.

555 Christina Bohannan and Herbert Hovenkamp, Creation Without Restraint: Promoting Liberty and Rivalry in Innovation (Oxford University Press 2012) 341.

556 For a similar view, taking the perspective that the objective to protect consumers is a distributive justice aim (fairness) that may enter in conflict with intellectual property in some circumstances, see Daniel A Farber and Brett McDonnell, 'Why (and How) Fairness Matters at the IP/Antitrust Interface' (2003) 87 Minnesota Law Review 1817.

to the same agency or the development of an overarching innovation policy bureau that would coordinate innovation policy across different government bureaus and regulatory agencies (e.g. an Office of Innovation Policy).[557] There are some examples of the integration of the IP and competition law enforcement in one authority (e.g. INDECOPI in Peru, yet this does not concern the award of IP rights).

Second, one might favour an institutional approach that would focus on the development of "trans-disciplinary links" between competition authorities and IP law offices,[558] but also between executive agencies and the judiciary. In the US, it is clear that both the DOJ and the FTC have been particularly active in the area of IP rights. Yet, in recent years there has been increased cooperation between the Antitrust Division of the DOJ, the FTC and the USPTO. First, a joint workshop on promoting innovation was organized in 2010 by these institutions. Second, the DOJ Antitrust Division and the USPTO have coordinated their action with regard to standard essential patents by adopting in January 2013 a joint policy statement on remedies for standard-essential patents subject to voluntary (F)RAND commitments. The joint policy statement addresses whether injunctive relief or exclusion orders in International Trade Commission investigations are properly issued when the patent holder asserts standards-essential patents that are encumbered by a (F)RAND licensing commitment and notes that monetary damages, rather than injunctive or exclusionary relief, should be the appropriate remedy for infringement.[559] There have also been proposals for restructuring the relations between the various innovation policy institutions and organizing frequent consultations ex ante between the USPTO and the DOJ/FTC.[560]

An illustration of this cooperation is that the European Patent Office submitted comments at the European Commission's Pharmaceutical Sector Inquiry,[561] in which the European Commission commented extensively on the EPO's process and suggested changes. An interesting institutional experiment came out of the Hargreaves report in the UK stressing the importance of competition as a necessary condition for innovation, enterprise and growth. Given the important role of competition, the Hargreaves report suggested the conferral of new functions to the IPO in this area, a proposal the government rejected as it would have jeopardized the independence of the competition authority. However, the competition authority in the UK (the Office of Fair Trading, OFT) agreed in 2012 to sign a non-binding Memorandum of Understanding (MoU) with the IPO putting in place a framework for a strengthened cooperation.[562] Notable features of this MoU are the provisions on the sharing of information on specific complaints, policy proposals or developments of policy and regulation having an impact on IP and competition, common advocacy efforts, regular meetings (at least quarterly to discuss matters of common interest) and procedures for the IPO to refer to the OFT cases where it considers that there may be competition concerns. The appointment of liaison officers or staff in charge of the interaction between competition law and intellectual property in the different authorities may also enhance cooperation and mutual understanding.[563]

It is important to expand and deepen this cooperation by the constitution of networks of competition authorities and intellectual property offices at a regional or global scale. More importantly, the judiciary should not be left out, in view of the dominant role it has in the interpretation of the standards for benefitting from IP protection and the development of adequate remedies in case of IP infringement. For the time being, there are only some mechanisms to establish cooperation between the DG competition at the European Commission and national courts of the different Member States of the EU (presumably including those in charge of IP law disputes).[564] Training programmes for judges may also enhance their economic expertise, as well as their knowledge of competition law and IP law principles.

SUMMARY: The incorporation of social science input (in particular economics) in IP law is a crucial but also challenging endeavor that could eventually lead to less tensions between IP and competition law. Evidence-based and influenced policy making in both IP law and competition law may also set the basis for a more intense collaboration between the competition authorities and the IP offices.

557 Stuart M Benjamin and Arti K Rai, 'Fixing Innovation Policy: A Structural Perspective' (2008) 77 (1) The George Washington Law Review 1.

558 See also William E Kovacic 'Competition Policy and Intellectual Property: Redefining the Role of Competition Agencies' in Lévêque and Shelanski (eds) (n 129) 1, 9 (advocating "the development of new cooperative networks in which competition agencies work with collateral government institutions, such as rights-granting authorities, to study the interaction of these regulatory regimes").

559 US DOJ & USPTO, 'Policy Statement on Remedies for Standard-Essential Patents Subject to Voluntary (F)RAND Commitments' (8 January 2013) available at <http://www.justice.gov/atr/public/guidelines/290994.pdf> last accessed 28 April 2013.

560 Arti K Rai, (n 545) 154.

561 See, European Commission Pharmaceutical Sector Inquiry Preliminary Report –Comments from the EPO (28 November 2008) available at <http://ec.europa.eu/competition/consultations/2009_pharma/european_patent_office.pdf> last accessed 28 April 2013.

562 Memorandum of Understanding between the Intellectual Property Office and the Office of Fair Trading (July 2012) available at <http://www.oft.gov.uk/shared_oft/MoUs/IPO.pdf> last accessed 28 April 2013.

563 See, for example, the establishment of an IP and Competition Policy unit at the Innovation Directorate of the Intellectual Property Office in the UK, or the creation of IP and innovation-focused units in competition authorities.

564 For example, Article 15 of Regulation 1/2003 on the enforcement of EU competition rules provides that the European Commission (the Directorate General on Competition) can transmit information to the national courts, give its opinion on questions regarding the application of the EU competition rules, submit observations to national courts as amicus curiae, the national courts being obliged to submit to the Commission a copy of their judgments touching upon issues of competition.

VI. CONCLUSION

The intersection between competition law and IP gives rise to complex trade-offs between incentives to innovate and dissemination of innovation, static and dynamic efficiency, total welfare and the welfare of consumers and difficult choices between rules and standards, general rules versus specific IP law regimes, ex ante versus ex post approaches. The interaction of IP rights with the economically inspired competition law has also led to an effort of re-conceptualization of this area of law from an economic perspective, for a long term absent from the day to day activity of the IP offices and courts in interpreting and delimiting IP boundaries in various economic sectors. Patent law has of course been the area of predilection of this more economic approach with an increasing number of economic and empirical studies examining the real effect of the IP rights granted to innovation and welfare.[565] From this perspective, the dialectical relation between these two disciplines has been an opportunity for re-conceptualizing IP rights and the property rights analogy that has for a long time provided the unifying narrative of this area of law.

This transformation of IP law is visible in the way the classic opposition in law and economic literature of property rules and liability rules took hold in order to explain the frequent limitations incurred by IP holders on their rights to exclude others from using their invention and enjoining the fruits of their investment by receiving an important compensation in the form of royalties.[566] The property rights analogy challenged, it appeared that the relation between property rules and liability rules for the protection of information forms a continuum: "when an innovator is forced to license its innovative technology, the protection afforded to him degrades from a property rule to a liability rule".[567] The emphasis on the cumulative nature of innovation contributes to this re-conceptualization of IP rights across these two poles. More importantly, the opposition between property rules and liability rules may provide a unifying theoretical framework for the analysis of the effects of different forms of protection of innovation to the IP rights holders. At one side of the continuum, patents provide the possibility to the IP holders to exclude imitators and duplicators by the award of an exclusive right to enjoin others from the use and commercialization of the invention, even if the infringer has duplicated the invention by her own effort; At the other side of the spectrum, trade secrets do not protect the inventors against independent discovery and duplication through reverse engineering; Copyright protects the expression of an idea, hence does not exclude the parallel development of an invention, although "it tends to put restrictions on reverse engineering ("circumvention of digital locks")".[568]

These different efforts of conceptualization of different forms of IP rights denote the challenge of constructing a theoretical framework that takes into account that the process of innovation does not only include the standalone invention step but also those of cumulative innovation, dissemination and commercialization to the benefit of consumers and society at large. The traditional conception of IP rights as property rights may not provide an accurate description of the innovation process and might lead to favor some actors in this process to the detriment of others.

One might be tempted to address IP law as a form of regulation: IP rights impose obligations on third parties, not as a consequence of a contract, tort or voluntary exchange, but because of the direct intervention of the government which aims to stimulate particular activities to foster the general welfare.[569] By conferring property rights on ideas, the government does not only seek to facilitate market transactions, as is the case for physical property rights, but also to correct a market failure, which is in this case "free riding that occurs when innovations are too easily copied, and the corresponding decrease in the incentive to innovate".[570] Hovenkamp observes,

"IP laws create property rights. But so do state created exclusive franchises and filed tariffs. In fact, the detailed regulatory regimes that we call the IP laws are filed with very rough guesses about the optimal scope of protection – ranging from the duration of patents and copyrights to the scope of patent claims and fair use of copyrighted material. The range of government estimation that goes on in the IP system is certainly as great as in regulation of, say, retail electricity or telephone service. Further, the IP regime is hardly immune from the legislative imperfections that public choice theory uncovers".[571]

Other authors have criticized the reward theory of patents, which "emphasises only one dimension of the patent instrument – compensation for innovation – and ignores the role of patents as means of regulating markets".[572] The same point is also made by Bently and Sherman for whom patents are "regulatory tools" which are used by governments in order to achieve economic as well as non-economic ends.[573] For example, the patent offices should also take into account "the

565 See, for instance, Michele Boldrin and David K Levine, 'The Case Against Patents' (September 2012) Federal Reserve Bank of St Louis Working Paper 2012–035A available at <http://www.research.stlouisfed.org/wp/2012/2012–035.pdf> accessed 28 April 2013; James Bessen and Michael J Meurer, Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk (Princeton University Press 2009); Guellec and van Pottelsberghe de la Potterie, (n 549); Jaffe and Lerner (n 138); Suzanne Scrothcmer, Innovation and Incentives (MIT Press 2004).

566 Guido Calabresi and A Douglas Melamed, 'Property Rules, Liability Rules and Inalielability: One View of the Cathedral' (1972) 85 (6) Harvard Law Review 1089; Mark A Lemley and Phil Weiser, 'Should Property or Liability Rules Govern Information?' (2007) 85 Texas Law Review 783.

567 Vincenzo Denicolò and Luigi Alberto Franzoni, 'Rewarding Innovation Efficiently – The case for Exclusive Rights' in Manne and Wright (eds) Competition Policy and Patent Law Under Uncertainty: Regulating Innovation (n 252) (Cambridge University Press 2011), 287, 289.

568 Ibid 290.

569 See, for instance, Ioannis Lianos, 'Competition Law and Intellectual Property Rights: Is the Property Rights' Approach Right?' in John Bell and Claire Kilpatrick (eds) 8 The Cambridge Yearbook of European Legal Studies (Hart Publishing 2006) 153.

570 Hovenkamp, The Antitrust Enterprise – Principle and Execution (n 141) 228.

571 Ibid 337.

572 Shubba Ghosh, 'Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor After Eldred' (2004) 19 Berkeley Technology Law Journal 1315, 1351.

573 Lionel Bently and Brad Sherman, Intellectual Property Law (2nd ed., Oxford University Press 2004, now in its 3rd edition, 2008) 329.

external effects of the impact of technology on the environment or health".[574]

Furthermore, Burk and Lemley argue that patent law is an industry and technology-specific regulation.[575] Different patent theories, such as prospect patents, incentives, cumulative innovation and anti-commons operate differently according to the particular industry's settings.[576] Exploring the enforcement of patents in the US, Burk and Lemley identify several "policy levers," which help the patent offices and the courts to frame IP doctrines which correspond to the needs of cumulative innovators and the consumers.[577] The existence of sector-specific IP protection on semi-conductors, software, medicinal products and biotechnology in Europe may better illustrate the point.[578]

Taking a regulatory perspective on IP enables us to conceptualize the interaction between competition law and IP as a dimension of the relation between government activity and competition. If one takes a public choice perspective, it is possible to argue that any form of state intervention in the marketplace carries the risk of capture and inefficiency: there is a wealth of empirical literature on the inefficiency of sector specific regulations, but similar claims have also been made with regard to competition law.[579] The burden of proof is on the State to establish the need of its intervention through competition law or through the grant of an exclusive right, here an IP right for innovation purposes, and the standard of proof is set high, on the assumption that the self-correcting mechanism of the market will take care of any eventual failure, in the absence of state interference. Such an approach leads essentially to subject state intervention to a stricter competition assessment than private action, as by essence the monolithic (and monopolistic) nature of government intervention departs more from the optimum of competitive markets (and the standard of perfect competition) than even concentrated private market structures. Yet, it is also clear that from this perspective the field left to competition law versus other forms of state intervention, such as IP law, remains open for negotiation, a negotiation conducted through and according to the rules of the communicating tool of welfare economics.

As a result, of a greater recourse to economics in public policy, the IP offices/authorities' bureaucracy see also its role change, as it is gradually transformed from a structure performing merely tasks of execution, involving a formalistic check of the conditions of patentability by looking to a close evidential environment (defined by the prior art) to a more proactive technocracy, assuming more often tasks of forecast, knowledge gathering/sharing with regard to the effects of the IP system on economic efficiency, welfare and innovation. The establishment of economic units within the IP authorities and economic and scientific advisory boards illustrates the gradual transformation of IP bureaucracy towards a more regulatory setting. Should they integrate more systematically dynamic economic analysis in their day to day work (through sector studies and empirical work), IP authorities (e.g. patent offices) may develop superior expertise than competition authorities or court, not only on the innovative nature of the patented technologies but also on the characteristics and conditions of the industry as a whole. This evolution towards a more regulatory IP law framework would, no doubt, alter the balance between the patent and IP offices and the courts, which enjoyed a dominant role in the interpretation and framing of IP law doctrine. If this hypothesis is confirmed, IP offices might be better placed to assess the welfare effects of their interventions on dynamic efficiency than competition authorities and courts. If there would be any claim for an antitrust authority to intervene in this configuration that would only happen, under this approach, because of the superior economic expertise of the antitrust authority on the specific matter or the fact that it responds ex post to an abuse of the IP process.

A regulatory approach to IP will also enable crucial reforms in the way patent offices operate: first, as this has been illustrated by the recent reforms introduced at the USPTO, such as the post grant review of patents, the IP authorities see their adjudicatory powers extended, which at the same time provides an additional forum ex post to challenge the exclusionary effect of patents, by contesting their validity, thus dealing with the eventual competition law problems that might arise from the awarded patent within an IP setting. Second, as the discussions over vesting the USPTO with substantive rulemaking authority at the passage of the America Invents Act show, patent offices may potentially become the hub of an innovation centred regulatory nexus, comprising competition authorities, sector specific regulators (e.g. telecom regulator), the food and drug administration, among others, with the aim to develop a coherent innovation policy that employs all the legal instruments at the disposal of the state in order to promote innovation to the benefit of consumers and society at large.

Finally, a regulatory approach to IP enables the consideration of the tensions between incentives to innovate and dissemination of innovation on a conceptual neutral theoretical

574 Ibid.

575 Dan L Burk and Mark A Lemley, 'Policy Levers in Patent Law' (2003) 89 Vanderbilt Law Review 1575.

576 Ibid 1615–1630.

577 Ibid 1687–1689 (e.g. while it is necessary to assure a broad patent protection for biotechnological and chemical inventions, "because of their high cost and uncertain development process", this is not the case for software industry).

578 Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products [1987] OJ L24/36; Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs [1991] OJ L122/42 (now replaced); Council Regulation 1768/92/EEC of 18 June 1992 concerning the creation of a supplementary protection certificate for medicinal products [1992] OJL 182/1; Directive 98/44/EC (n 31).

579 Fred S McChesney and William F Shughart II (eds), The Causes and Consequences of Antitrust: the Public Choice Perspective (University of Chicago Press 1995).

framework. IP law and policy has a specific function and should not be considered as a facet of competition policy[580].

The intersection of IP law with competition law has also led to a re-examination of competition law's traditional focus on static allocative efficiency. Dynamic analysis has made inroads into merger analysis and is increasingly considered as essential also for the competition law assessment of unilateral conduct, at least theoretically. Practically, however, there are few instances competition law has incorporated systematically dynamic analysis and the focus on dynamic efficiency. There are many reasons for this.

First, from an institutional perspective, courts are considered as less able to conduct the sophisticated analysis required in this context.[581] The adjudicative process limits the type of evidence heard by the court: this should relate directly to the dispute and is brought by the parties to the dispute. This may not include the effect of the specific practice on consumers in related relevant markets, future generations of consumers or the general public. Competition authorities, the dominant enforcement actor in Europe, are better placed than courts to conduct this type of complex polycentric economic analysis, as they dispose of in house economic expertise and the powers to investigate different sectors of the economy (through sector inquiries). Their intervention as amicus curiae in IP law related judicial disputes, each time competition law concerns arise, may be an effective way to influence the IP adjudication process to a more competition friendly approach. Their collaboration with the patent and other IP offices within the innovation regulatory nexus may also enhance a more systematic consideration of dynamic efficiency concerns in competition law analysis, in particular if the IPO offices conduct periodic empirical and economic analyses on the effect of patents on the level of innovation in various industries. The constitution of a common evidence base between competition authorities and IP offices, resulting from the competition authorities' and IP offices' sector inquiries, which would feed in their rulemaking and adjudicatory process constitutes an additional means to ensure the congruence of their action.

Second, from a substance perspective, competition authorities do not dispose of the means, tools and methods to conduct systematic dynamic competitive analysis on a case-by-case basis. Authorities operate in an adjudicatory context with strict deadlines and a limited timeline for making decisions. Dynamic analysis is occasionally added after the competition authority has completed a static analysis, but it is not incorporated directly in their economic analysis of the competitive situation at the outset.[582] At the same time, in what has been named the "new economy", network effects are prevalent and in combination with intellectual property rights they may harm consumers and ultimately innovation.[583] Yet, the use of the tools of dynamic and stochastic efficiency analysis is not widespread among competition authorities and the data required for doing a more sophisticated analysis are unavailable in most cases. The law of evidence may also pose hurdles to the submission of econometric evidence, which is the statistical complement of a dynamic theory of competition.[584]

The different presumptions and rules on inferences applying in competition law and IP law operate thus as a second best, less costly but of course more prone to errors, option to an extended and complex dynamic economic analysis that the current institutional setting and the tools at its disposal may not be ready to provide. Consequently, both disciplines should take stock of their own imperfections in their mutual interaction with each other.

Yet, what appears important for both disciplines to take into account is the changing environment of the sources of innovation. Schumpeter emphasized the role of the entrepreneur and opposed the active role she or he plays in the innovative process to the passive role of the consumer.[585] His point was that most innovation is entrepreneur-generated. This view accommodates the perception that the main actor in the innovation process is the inventor (or more broadly the entrepreneur) and that law should provide the right set of tools in order to enhance his or her inventive activity. One could compare this entrepreneur/inventor centered view of innovation to the increasing role of consumer-generated innovation. As it has been noted in the Hargreaves report, the focus on services instead of products is one of the major characteristics of the "new innovation process":

"(s)ervices are usually produced at the point at which they are consumed: the act of consumption rather than invention is the focal point for innovation […] (n)ew services are developed using a 'market facing' approach, often connected to information databases generated by people and organisations that articulate and express their requirements and demands as they experience the innovation. This is sometimes described as a more democratic approach to innovation, where compa-

580 See the recent judgment of the Court of Justice in Joined Cases C-274/11 & C-295/11, Spain v. Council and Italy v. Council [April 16, 2013, not yet published], para. 22, on the shared or exclusive nature of the competence of the EU in the establishment of a unitary patent protection, following the enhanced cooperation initiatives of some Member States, the Court held that the relevant provision for the creation of centralised IP rules fell outside Articles 101 to 109 TFEU [the EU competition rules] and thus the exclusive competence of the EU, noting that " [a] lthough it is true that rules on intellectual property are essential in order to maintain competition undistorted on the internal market, they do not, for all that […] constitute 'competition rules' for the purpose of Article 3 (1) (b) TFEU".

581 Geoffrey A Manne and Joshua D Wright, 'Innovation and the Limits of Antitrust' (2010) 6 Journal of Competition Law & Economics 153.

582 Joseph A Schumpeter, History of Economic Analysis (Routledge 1986, first published in 1954), p. 1126, noting the importance of sequence analysis and observing as to the history of economic thought that "however important those occasional excursions into sequence analysis may have been, they left the main body of economic theory on the 'static' bank of the river; the thing to do is not to supplement static theory by the booty brought back from these excursions but to replace it by a system of general economic dynamics into which statics would enter as a special case".

583 Daniel J Gifford and Robert T Kudrle, 'Antitrust Approaches to Dynamically Competitive Industries in the United States and the European Union' (2011) 7 (3) Journal of Competition Law & Economics 695; Ilya Segal and Michael D Whinston, 'Antitrust in Innovative Industries' (2007) 97 American Economic Review 1703.

584 See, for instance, the empirical analysis of Ioannis Lianos and Christos Genakos, 'Econometric Evidence in EU Competition Law: An Empirical and Theoretical Analysis' (1 October 2012) CLES Research Paper series 06/12. Available at SSRN: <http://ssrn.com/abstract=2184563> or <http://dx.doi.org/10.2139/ssrn.2184563> accessed 28 April 2013.

585 Schumpeter (n 6).

nies trial different approaches – such as beta versions of web pages – and respond to user feedback".[586]

Users participate to the development of innovation in the market.[587] This should presumably get them a better share of the surplus innovation creates (in the form of choice, lower prices etc) Sometimes, the fact that innovation was consumer driven may affect the way competition law is enforced: in the IMS/NDC Health case relevant to the application of Article 102 to a refusal to license (see our analysis above), the Court of Justice of the EU observed that the brick structure to which NDC Health wanted to have access was created with the assistance of consumers who provided data on their consumption habits and became for that reason an indispensable input for the provision of the services in the downstream market of regional sales data on pharmaceutical products.

Another important source of change is what some have called "IP without IP", intellectual production without intellectual property in order to describe the many instances in which the process of creativity does not rely as such on the award of intellectual property rights.[588] The open access movement in software,[589] the "piracy paradox" in the fashion industry,[590] to name but a few examples, illustrate that innovation may the product of cooperation and sharing without the protective net of exclusivity rights and that the quest of monetary profits is not the only determinant of incentives to innovate.[591] As it noted in the Hargreaves report,

"The nature of services innovation implies that answers to technical problems will not lie exclusively within research institutions or companies with proprietary R&D cultures and the means to manage and protect IP. Instead, they will emerge through integration of ideas from a wide range of organisations, some of whom may consider managing IPR to be an unacceptable obstacle in a high value business, raising further challenges to traditional concepts of ownership of IP".[592]

Although it is clear that these open innovation systems are "functionally dependent" on copyright, patent, trademark, or trade secrecy law,[593] relying on the traditional "property rights" approach to IP presents the risk that this important dimension of this "new innovation process" will be ignored. The regulatory perspective to IP law mitigates that risk and provides a richer theoretical framework for the intersection of competition law with IP law.

586 Hargreaves (n 20) 14.

587 Eric von Hippel (n 21); Fred Gault and Eric von Hippel, 'The Prevalence of User Innovation and Free Innovation Transfers: Implications for Statistical Indicators and Innovation Policy' MIT Sloan School of Management. Research Paper No. 4722–09 (January 2009) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1337232 accessed 28 April 2014; Strandburg K J, 'Users as Innovators: Implications for Patent Doctrine' (2008) 79 University of Colorado Law Review 467.

588 Dreyfuss, 'Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm' (n 22) referring to a term coined by Mario Bagioli.

589 See, for instance, Josh Lerner and Jean Tirole, 'The Economics of Technology Sharing: Open Source and Beyond' (2005) 19 Journal of Economic Perspectives 99.

590 See, for instance, Kal Raustiala and Christopher Sprigman, 'The Piracy Paradox: Innovation and Intellectual Property in Fashion Design' (2006) 92 Vanderbilt Law Review 1687.

591 Yochai Benkler, ' "Sharing Nicely": On shareable goods and the emergence of sharing as a modality of economic production' (2004) 114 Yale Law Journal 273; Lerner and Tirole (n 590).

592 Hargreaves (n 20) 14.

593 Dreyfuss, 'Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm' (n 22).

TABLE REFERENCES LEGISLATION & BIBLIOGRAPHY

Table of Legislation

International Agreements

Agreement on Trade Related Aspects of Intellectual Property Rights, 15 Apr. 1994

Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments – Results of the Uruguay Round vol. 31, 33 I.L.M. 81 (1994)

International Convention of the Protection of New Varieties of Plants, Ger.– Neth.– U.K., Dec. 2, 1961, 815 U.N.T.S. 89 (revised Nov. 10, 1972, Oct. 23, 1978 and Mar. 19, 1991)

Convention on the Grant of European Patents, Oct. 5, 1973, 13 I.L.M. 270, 1065 U.N.T.S. 199 (revised at the Convention on the Grant of European Patents Nov. 29, 2000), arts. 52–53

World Trade Organization, Declaration on the TRIPS Agreement and Public Health, WT/MIN (01) /DEC/2, November 20, 2001, 41 I.L.M. 755 (2002)

World Trade Organization, Ministerial Declaration of November 14, 2001, WT/MIN (01) /DEC/1, 41 I.L.M. 746 (2002)

United States

Bayh-Dole Act, 35 U.S.C. §§200–212

Hatch-Waxman Act, 21 U.S.C. §355.

Stevenson-Wydler Technology Ac, 15 U.S.C. §§3701–37014

Leahy-Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. (US) 284 (2011) amending 35 U.S.C. § § 1-367.

Clayton Act of 1914, 15 USC §§12–27, 29 U.S.C. §§52–53

Jurisdiction of the United States Court of Appeals for the Federal Circuit, 28 U.S.C. §1295

US Department Of Justice and the Federal Trade Commission, Horizontal Merger Guidelines (19 August 2010) – Antitrust Guidelines for the Licensing of Intellectual Property (6 April 1995)

US Department of Justice and United States Patent and Trademark Office, 'Policy Statement on Remedies for Standard-Essential Patents Subject to Voluntary (F)RAND Commitments' (8 January 2013)

United Kingdom

UK Patents Act of 1977

Memorandum of Understanding between the Intellectual Property Office and the Office of Fair Trading (July 2012) available at <http://www.oft.gov.uk/shared_oft/MoUs/IPO.pdf>

Germany

Gesetz zur Umsetzung der Richtlinie über den rechtlichen Schutz biotechnologischer Erfindungen [Statute Implementing the EU Biotechnology Directive] Jan. 21, 2005, BGBl. I at 146, § 1a (4) (F.R.G.).PatG § 1a (4)

France

Code de la Propriété Intellectuelle Art. L613–2–1

India

India Patent Act

European Union

Charter of the Fundamental Rights of the European Union [2000] C 364/01

EU Secondary Legislation

Council Directive 87/54/EEC of 16 December 1986 on the legal protection of topographies of semiconductor products [1987] OJ L24/36

Council Regulation 4064/89/EEC of 21 December 1989 on the control of concentrations between undertakings [1989] L395/1

Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs [1991] OJ L122/42 (now replaced)

Council Regulation 1768/92/EEC of 18 June 1992 concerning the creation of a supplementary protection certificate for medicinal products [1992] OJL 182/1

Commission- Green Paper on Innovation' COM (95) 688 final, 20 December 1995

Parliament and Council Directive 96/9/EC of 11 March 1996 on the legal protection of databases [1996] OJ L077/20

Parliament and Council Directive 98/44/EC of 6 July 1998 on the legal protection of biotechnological inventions [1998] OJ L213/13

Proposal for a Directive of the European Parliament and of the Council amending Directive 98/71/EC on the legal protection of designs COM (2004) 582 final.

Parliament and Council Directive 98/71/EC of 13 October 1998 on the legal protection of designs [1998] OJ L289/28

Council Regulation 1/2003/ EEC on the implementation of the rules of competition laid down in Articles 81 and 82 of the Treaty

Council Regulation 772/2004/EC of 27 April 2004 on the application of Article 81 (3) of the Treaty to categories of technology transfer agreements [2004] OJ L123/11

Commission Regulation 330/2010/EU of 20 April 2010 on the application of Article 101 (3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices

Commission Notice- Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements [2004] OJ C 101/2

Commission Notice- Guidelines on the Application of Article 81 (3) of the Treaty [2004] OJ C101/97

Communication from the Commission- Guidance on the Commission's enforcement priorities in applying article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings [2009] C45/7

Communication from the Commission-Guidelines on the Application of Article 101 of the Treaty of the European Union to horizontal cooperation agreements [2011] OJ C 11

Parliament and Council Directive 2008/95/EC of 22 October 2008 to approximate the laws of the Member States relating to trade marks [2008] L 299/25

Parliament and Council Directive 2009/24/EC of 23 April 2009 on the legal protection of computer program [2009] OJ L111/16

Commission of the European Communities- First evaluation of Directive 96/9/EC on the legal protection of databases (Brussels, 12 December 2005)

European Commission Pharmaceutical Sector Inquiry Preliminary Report –Comments from the EPO (28 November 2008)

European Commission, Executive Summary of the Pharmaceutical Sector Inquiry Report (2009)

European Commission, Competition DG, Pharmaceutical Sector Inquiry: Final Report (8 July 2009)

Draft Guidance Paper, Quantifying Harm in Actions for Damages based on Breaches of Article 101 and 102 of the Treaty of the Functioning of the European Union- Public Consultation (June 2011)

Draft Communication from the Commission, Guidelines on the application of Article 101 of the Treaty on the Functioning of the European Union to technology transfer agreements, C (2013) 94 draft

Table of Cases

United States

Federal Trade Commission

Genzyme Corporation / Novazyme Pharmaceuticals, Inc. and the statement of Chairman T. Muris (critical to the use of the concept)

In re Negotiated Data Solutions LLC, FTC File No. 051–0094, Decision and Order (January 232008)

In re Robert Bosch GmbH, FTC File N. 121–0081, Decision and Order (Nov. 262012)

Analysis of Proposed Consent Order To Aid Public Comment at 4–6, In re Negotiated Data Solutions LLC, File No. 0510094 (January 232008)

In re Google Inc., FTC File No. 121–0120 (January 3, 3013)

In the matter of Rambus, Inc. (August 2, 2006), Docket No. 9302

ESS Tech., Inc. v. PC-Tel, Inc., No. C-99–20292 RMW, 2001 WL 1891713, at 3–6 (N.D. Cal. Nov. 28, 2001), Rambus, Broadcom etc).

Case Law

Darcy v Allen (The Case of Monopolies) (1602), Moore (K.B.) 671

Westinghouse v Boyden Power Brake Co., 170 US 537 (1898)

Bement v National Harrow Co., 186 US 70 (1902)

Dr. Miles Med. v. John D. Park & Sons, 220 US 373 (1911)

United States v Terminal R.R. Ass'n, 224 US 383 (1912)

Henry v AB Dick Company, 224 US 1 (1912)

Motion Picture Patents Company v Universal Film Manufacturing Company et al., 243 US 502 (1917)

United States v Colgate & Co., 250 US 300, 307 (1919)

United States v. General Electric, 272 US 476 (1926)

Morton Salt Co. v Suppiger Co., 314 US 488 (1942)

Associated Press v United States, 326 US 1 (1945)

Graver Tank & Mfg. Co. v Linde Air Products Co., 339 US 605, 608 (1950)

Eastern Railroad Presidents Conference v Noerr Motor Freight 365 U.S. 127 (1961)

Walker Process Equipment v Food Mach. & Chem Corp., 382 US 172 (1965)

United Mine Workers v Pennington 381 US 657 (1965)

Graham v John Deere Co 383 US 1 (1966)

Georgia-Pacific Co. v United States Plywood Co., 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970) mod'd, 446 F.2d 295 (2d Cir. 1971)

Otter Tail Power Co. v United States, 410 US 366 (1973)

Broadcast Music, Inc. v Columbia Broadcast. System, Inc., 441 US 1 (1979)

Diamond v Chakrabarty, 447 US 303 (1980)

Berkey Photo, Inc v. Eastman Kodak Co., 603 F2d 263, 294 (2nd Cir. 1979), cert. denied, 444 US 1093 (1980)

American Society of mechanical Engineers v Hydrolevel Corp., 456 US 556 (1982)

MCI Communications Corp. v AT&T, 708 F.2d 1081, 1132–1133 (7th Cir. 1983)

Roche Products, Inc. v Bolar Pharmaceuticals, Inc., 733 F.2d 858 (Fed. Cir. 1984)

Jefferson Parish Hospital District No 2 v. Hyde, 466 US 2, 16 (1984)

Allied Tube & Conduit Corp. V Indian Head, Inc., 486 US 492 (1988)

Scripps Clinic & Research Foundation v Genentech, Inc., 927 F.2d 1565, 1580 (Fed. Cir. 1991)

Feist Publications v Rural Telephone Service Company, 499 US 340 (1991)

Mallinckrodt, Inc. v Medipart, Inc., 976 F.2d 700 (Fed. Cir. 1992)

Professional Real Estate Investors, Inc v Columbia Pictures Indus., Inc, 508 U.S. 49 (1993)

Data General Corp. v Grumman Systems, 36 F2d 1147, 1187 (1st Cir. 1994)

In re Deuel, 51 F.3d 1552 (Fed. Cir. 1995)

Re Dell, 121 FTC 616 (1996)

Regents of the University of California v Eli Lilly and Co., 119 F.3d 1559 (Fed. Cir. 1997)

Fonar Corp. v Gen. Elec. Co., 107 F.3d 1343 (Fed. Cir. 1997)

Image Technical Services v Eastman Kodak, 125 F3d 1195 (9th Cir. 1997)

Nobelpharma AB v Implant Innovations, Inc., 141 F.3d 1059 (Fed. Cir. 1998)

C.R. Bard, Inc. v M3 Systems, 157 F.3d 1340 (Fed. Cir. 1998)

United States v Microsoft Corp., 147 F.3d 935 (D.C. Cir. 1998)

Re Independent Service Organizations Antitrust Litigation, 203 F.3d 1322 (Fed. Cir. 2000)

United States v Microsoft Corp., 253 F.3d 34, 89 (D.C. Cir. 2001)

Harvard College v Canada (2002) 4 S. Ct.R. 45

Festo Corp. v Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 US 722 (2002)

Madey v Duke University, 307 F.3d 1351 (Fed.Cir. 2002)

In re Cardizem CD Antitrust Litig., 332 F.3d 896 (6th Cir. 2003) (Cardizem)

Andrx Pharm., Inc. v Kroger Co., 543 U.S. 939 (2003)

Schering Corp. v Geneva, Inc., 339 F.3d 1373 (Fed. Cir. 2003)

Re Union Oil Co. of California, 2004 FTC LEXIS 115 (July 7, 2004)

Verizon Communications, Inc. v Law Offices of Curtis V. Trinko, LLP, 540 US 398 (2004)

US Philips Corp. v. ITC, 424 F3d 1179 (Fed. Cir. 2005)

Schering-Plough Corp. v. F.T.C., 402 F.3d 1056 (11th Cir. 2005)

Merck KGaA v Integra Lifesciences I, Ltd., 545 U.S. 193 (2005)

Re Rambus, Inc., Dkt. No. 9302, 2006 FTC LEXIS 101 (Aug. 20, 2006)

eBay, Inc. v MercExchange, L.L.C., 547 U.S. 388 (2006)

In re Tamoxifen Citrate Antitrust Litig., 466 F.3d 187 (2d Cir. 2006)

Illinois Tool Works v Independent Ink, 126 S. Ct 1281 (2006)

Jazz Photo Corp. v U.S., 439 F.3d 1344 (Fed. Cir. 2006)

Texaco, Inc. v Dagher, 547 US 1 (2006)

Illinois Tool Works Inc. v. Independent Ink Inc., 547 US (2006)

MedImmune, Inc. v Genentech, Inc., 549 U.S. 118 (2007)

Leegin Creative Leather Prods., Inc. v. PSKS, Inc., 551 U.S. 877 (2007)

KSR Int''l Co. v Teleflex Inc., 550 U.S. 398 (2007)

Broadcom Corp. v. Qualcomm, 501 F.3d 311 (3d Cir. 2007)

In re Ciprofloxacin Hydrochloride Antitrust Litig., 544 F.3d 1323 (Fed. Cir. 2008)

Quanta Computer, Inc. v LG Electronics, 553 U.S. 617 (2008)

Tafas v Doll, 559 F. 3d 1345 (Fed. Cir. 2009)

Princo Corp v. ITC, 563 F.3d 1301 (Fed Cir. 2009)

Rambus Inc. v. FTC, 522 F3d 456 (DC Cir. 2008), cert. denied, 129 S. Ct. 1318 (2009)

Lucent Technologies, Inc. v Gateway, Inc., 580 F.3d 1301 (Fed. Cir. 2009)

In re Kubin, 561 F.3d 1351 (Fed. Cir. 2009)

Ark. Carpenters Health & Welfare Fund v Bayer AG, 604 F.3d 98, reh'g en banc denied, 625 F.3d 779 (2d Cir. 2010)

Bilski v Kappos, 130 S. Ct. 3218 (2010)

Ariad Pharmaceuticals, Inc. v Eli Lilly and Co., 598 F.3d 1336, 1341 (Fed. Cir. 2010) (en banc).

Mayo Collaborative Services v Prometheus Laboratories, Inc., 132 S. Ct. 1289 (2012)

Mayo Collaborative Services v Prometheus Laboratories, 132 S. Ct. 1289 (2012)

Apple, Inc. v Motorola, Inc., 869 F. Supp.2d 901 (N.D. Ill. 2012)

In re Robert Bosch GmbH, File Bo 121–0081 (November 26, 2012)

Kirtsaeng v. John Wiley & Sons, Inc.,– S. Ct. (March 19, 2013)

Monsanto Co. v Bowman, S. Ct. (May 13, 2012).

European Union

Commission Decisions

B&I Line plc v Sealink Harbours Ltd and Sealink Stena Ltd [1992] CMLR 255

Sea Containers v Stena Sealink [1994] OJ L15/8

Commission Decision, Case COMP/A 36.568/D3, Scandlines Sverige AB v Port of Helsingborg (23 July 2004)

Commission Decision, Case COMP/C-3/37.792) Microsoft/ W2000 (24 March 2004)

Commission Decision, Case COMP/A. 37.507/f3, 2005) AstraZeneca (15 June 2005)

Commission Decision, Case COMP/A. 37. 507/ F3- AstraZeneca [2006] OJ L 332/24

Commission Decision, Case COMP/C2/38.698 – CISAC (16 July 2008)

Commission Decision, Case COMP/C-3/39.530 – Microsoft (tying) (16 December 2009)

Commission Decision, Case COMP/38.636 Rambus (9 December 2009)

Commission Decision, Case No COMP/M.6381, Google/Motorola Mobility (13 February 2012)

Case Law

C-56/64 and 58/64 Consten and Grundig v Commission (1966) ECR 299

Case 78/70 Deutsche Grammophon Gesellschaft mbH v Metro-SB-Grossmarketete GmbH & Co (1971) ECR 487

Case 15/74 Centrafarm BV and Adriaan de Peijper v Sterling Drug Inc (1974) ECR 1147

Case 119/75 Terrapin (Overseas) Ltd. v Terranova Industrie CA Kapferer & Co (1976) ERR 1039

Case 13/77 INNO / ATAB (1977) ECR 2115

Case 102/77 Hoffmann-La Roche & Co. AG v Centrafarm (1978) ECR 1139

Case C 3/78 Centrafarm v American Home products corporation (1978) ECR 1823

Case 85/76 Hoffmann-La-Roche v. Commission (1979) ECR 461

Case 258/78 Nungesser v Commission (1982) ECR 2015

Joined Cases 142 and 156/84 BAT and Reynolds v Commission (1987) ECR

Case 35/83 BAT Cigaretten-Fabriken GmbH v Commission (1985) ECR 363

Case 311/84 CBET v. Compagnie Luxembourgeoise de Télédiffusion SA (1985) ECR 3261

Case 298/83 Comité des industries cinématographiques des Communautés européennes v Commission (1985) ECR 1105

Case 193/83 Windsurfing International v Commission (1986) ECR 611

Case 27/76 United Brands v. Commission (1978) ECR 207

Case 27/87 SPRL Louis Erauw-Jacquery v La Hesbignonne SC (1988) ECR 1919

Case 53/87 CICCRA v Renault (1988) ECR 6039

C-355/96 Silhouette International Schmied GmbH & Co. KG v Hartlauer Handelsgesellschaft mbH (1988) ECR I-4799

Case 238/87 Volvo v Veng (1988) ECR 6211

Case 395/87, Ministère public v Jean-Louis Tournier (1989) ECR 2521

Case 110/88 Lucazeau v SACEM (1989) ECR 2811

Case 265/87 Herman Schräder HS Kraftfutter GmbH v Hauptzollamt Gronau (1989) ECR 2237

Case T-51/89 Tetra Pak (1990) ECR II-309

Case T-51/89, Tetra Pak Rausing S.A. v Commission (1990) ECR II-309

Case T-69/89 RTE v Commission (1991) ECR II-485

Case T-76/89 ITP v Commission (1991) ECR II-575

Case T-70/89 British Broadcasting Corporation and BBC Enterprises Ltd v Commission (1991) ECR II-535

Joined Cases C-241/91 and C-242/91 Radio Telefis Eireann v Commission (Magill), ECR (1995) I-743

Joined cases C-241/91 P and C-242/91 P, Radio Telefis Eireann (RTE) and Independent Television Publications Ltd (ITP) v Commission (1995) ECR I-743

Case C-333/94 P, Tetra Pak v Commission (Tetra Pak II) (1996) ECR I-5991

Case T-504/93 Tiercé Ladbroke SA v Commission (1997) ECR II-923

Case T-111/96, ITT Promedia NV v Commission (1998) ECR II-2937

Case C-7/97 Oscar Bronner GmbH & Co KG v Mediaprint Zeitungs- und Zeitschriftenverlag GmbH & Co KG (1998) ECR I-7791

FAG-Flughafen Frankfurt/Main AG, 98/190, OJ (1998) L 72/30

Case C-344/98 Masterfoods Ltd. v HB Ice Cream Ltd (2000) ECR I-11369

C-414 & 416/99 Zino Davidoff and Levi Straus (2001) ECR I-8691

C-143/00 Boehringer Ingelheim (No. 1) (2002) ECR I-3759

Case T-86/95 Compagnie générale maritime and others v Commission (2002) ECR II-2011

C-244/00 Van Doren + Q (2003) ECR I-3051

Case T-213/00 CMA GCM & Others v Commission (2003) ECR II-913

Case C-203/02 The British Horseracing Board Ltd and Others v William Hill Organisation Ltd (2004) ECR I-10415

Case C-444/02 Fixtures Marketing Ltd v Organismos Prognostikon Agonon Podosfairou AE – OPAP (2004) ECR I-10549

Case C-46/02 Fixtures Marketing Ltd. V Oy Veikkaus Ab (2004) ECR I-10365

Case C-338/02 Fixtures Marketing Limited v AB Svenska Spel (2004) ECR I-10497

Case C-418/01 IMS Health GmbH & Co OHG v NDC Health GmbH & Co KG (2004) ECR I-5039

Case T-201/04 Microsoft v Commission (2007) ECR II-3601

Joined Cases C-468/06 to 478/06 Sot. Lelos kai Sia v GlaxoSmithKline (2008) ECR

Case C-52/07 Kanal 5 Ltd v Föreningen Svedska Tonsättares Internationella Musikbyrå (STIM) UPA (2009) ECR I-9275

Joined Cases C-501/06 P, C-513/06 P, C-515/06 P and C-519/06 P GlaxoSmithKline Services Unlimited v Commission (2009) ECR I-929

Case T-321/05 AstraZeneca AB v Commission (2010) ECR II-2805

Case C-34/10 Brüstle v Greenpeace eV, Judgment (18 October 2011), not yet published

Case C-549/10 Tomra Systems ASA v Commission (12 April 2012), not yet published

Case T-167/08, Microsoft Corp. v European Commission (27 June 2012), not yet published

Case C-457/10P AstraZeneca AB v. Commission (6 December 2012), not yet published

Case T-442/08 International Confederation of Societies of Authors and Composers (CISAC) (12 April 2013), not yet published

Joined Cases C-274/11 & C-295/11, Spain v. Council and Italy v. Council (16 April 2013), not yet published

UK

Intel Corp. v Via Technologies Inc. [2002] EWCA Civ 1905 (Civil Division – Court of Appeal)

Attheraces Limited v. The British Horseracing Board Limited [2007] EWCA Civ 38

Bibliography

ABA Section of Antitrust Law, Intellectual Property and Antitrust Handbook (American Bar Association 2007)

Ahlborn C, Evans D S and Padilla J A 'The Logic & Limits of the "Exceptional Circumstances Test" in Magill and IMS Health' (2004) 28 Fordham International Law Journal 1109

Anderman S, 'Does the Microsoft Case offer a New Paradigm for the Exceptional Circumstances Test and Compulsory Copyright Licenses under EC Competition Law?' (2004) Competition Law Review 7

Andrews R et al (eds), The Columbia World of Quotations No. 41418 (Columbia University Press 1996)

Aoki M, Towards a Comparative Institutional Analysis (The MIT Press 2001) 347

Averitt N W and Lande R H (1997), 'Consumer Sovereignty: A Unified Theory of Antitrust and Consumer Protection Law' (1997) 65 Antitrust Law Journal 713

Baker J, 'Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation' (2007) 74 (3) Antitrust Law Journal 575

Baxter W F, 'Legal Restrictions on Exploitation of the Patent Monopoly: An Economic Analysis' (1966) Yale Law Journal 267

Baxter W F, World Patent Law and Practice §8.02 (Matthew Bender, 1969)

Baxter W F, 'The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies' (1984) 53 Antitrust Law Journal 717

Benjamin S M and Rai A K, 'Fixing Innovation Policy: A Structural Perspective' (2008) 77 (1) The George Washington Law Review 1

Benkler Y, 'Coase's Penguin, or, Linux and the Nature of the Firm' (2002) 112 Yale Law Journal 369 – ' "Sharing Nicely": On shareable goods and the emergence of sharing as a modality of economic production' (2004) 114 Yale Law Journal 273

Bently L and Sherman B, Intellectual Property Law (Oxford University Press 2008)

Binmore K G, Game Theory and the Social Contract: Playing Fair (MIT Press 1994)

Bessen J and Meurer M J, Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk (Princeton University Press 2009)

Bohannan C and Hovenkamp H, Creation Without Restraint: Promoting Liberty and Rivalry in Innovation (Oxford University Press 2012)

Bouckaert B, 'What is Property?' (1990) 13 Harvard Journal of Law and Public Policy 775

Bowman W S, 'Tying Arrangements and the Leverage Problem' (1957) 67 Yale Law Journal 19 – Patent and Antitrust Law: A Legal and Economic Appraisal (University of Chicago Press 1973)

Bronwyn H H and Rosemarie H Ziedonis R H, 'The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979–1995' (2001) 32 (1) Rand Journal of Economics 101

Burk D L and Lemley M A, 'Policy Levers in Patent Law' (2003) 89 Vanderbilt Law Review 1575 – The Patent Crisis and How Courts Can Solve it (University of Chicago Press 2009)

Calabresi G and Melamed D A, 'Property Rules, Liability Rules and Inalielability: One View of the Cathedral' (1972) 85 (6) Harvard Law Review 1089

Carlton D W and Waldman M, 'The Strategic Use of Tying to Preserve and Create market Power in Evolving Industries' (2002) 33 Rand Journal of Economics 194

Carrier M A, 'Unravelling the Patent-Antitrust Paradox' (2002) 150 (3) University of Pennsylvania Law Review 761

Carrier M A, 'Resolving the Patent-Antitrust Paradox Through Tripartite Innovation' (2003) 56 Vanderbilt Law Review 1047

Carrier M A, Innovation for the 21st Century: Harnessing the Power of Intellectual Property and Antitrust Law (Oxford University Press 2011)

Chesbrough H W, Open Innovation: The New Imperative for Creating and Profiting from Technology (Harvard Business School Press 2003)

Choi J P, 'Preemptive R&D, Rent Dissipation and the 'Leverage Theory' (1996) 110 Quarterly Journal of Economics 1153

Choi J P and Stefanadis C, 'Tying, Investment, and the Dynamic Leverage Theory' (2001) 32 Rand Journal of Economics 52

Cohen W M and Walsh J P, 'Access – or Not – in Academic Biomedical Research' in Rochelle C. Dreyfuss, et al (eds), Working Within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Economy 3

Cotter T F, 'Patent Holdup, Patent Remedies, and Antitrust Responses' (2009) 34 (4) The Journal of Corporate Law 1151

Dam K W, 'The Economic Underpinnings of Patent Law' (1994) 23 Journal of Legal Studies 247

Davison M J and Hugenholtz P B 'Football Fixtures, Horseraces and Spin Offs: The ECJ Domesticates the Database Right' (2005) European Intellectual Property Review 113

Demsetz H, '100 Years of Antitrust: Should we Celebrate?' Brent T. Upson Memorial Lecture, George Mason University School of Law, Law and Economics Center (1991)

Derclaye E, 'Databases Sui Generis Right: Should We Adopt the Spin-off Theory' (2004) 26 (9) European Intellectual Property Review 402

Derclaye E, 'The Court of Justice Interprets the Database Sui Generis Right for the First Time' (2005) European Law Review 420

Denicolò V and Franzoni L A, 'Rewarding Innovation Efficiently – The case for Exclusive Rights' in Manne and Wright (eds) Competition Policy and Patent Law Under Uncertainty: Regulating Innovation (Cambridge University Press 2011)

Dreier T, 'Balancing Proprietary and Public Domain Interests: Inside or Outside of Proprietary Rights?' in Dreyfuss R C, Harry First H and Zimmerman D (eds) Expanding the Boundaries of Intellectual Property (Oxford University Press 2001)

Dreyfuss R C, 'The Federal Circuit: A Case Study in Specialized Courts' (1989) 64 New York University Law Review 1 (1989)

Dreyfuss R C, 'Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm' (2010) 31 Cardozo Law Review 1437

Dreyfuss R C, 'What the Federal Circuit Can Learn From the Supreme Court – and Vice Versa' (2010) 59 American University Law Review 787

Economides N and Lianos I, 'The Elusive Antitrust standard on bundling in Europe and in the United States in the Aftermath of the Microsoft cases' (2009) 76 (2) Antitrust Law Journal 483

Economides N and Lianos I, 'A Critical Appraisal of Remedies in the EU Antitrust Microsoft Cases' 20102 Columbia Business Law Review 346

Elhauge E, 'Do Patent Holdup and Royalty Stacking Lead to Systematically Excessive Royalties?' (2008) 4 Journal of Competition law & Economics 535

Ellig J and Lin D, 'A Taxonomy of Dynamic Competition Theories' in Ellig J (ed), Dynamic Competition and Public Policy – Technology, Innovation and Antitrust Issues (Cambridge University Press 2011)

Evans D S and Schmalensee R, 'Some Economic Aspects of Antitrust Analysis in Dynamically Competitive Industries' in Jaffe A B, Lerner J and Stern S (eds), Innovation Policy and the Economy, Vol. 2, (MIT Press 2002)

Evans D S and Padilla J A, 'Excessive Prices: Using Economics to Define Administrable Legal Rules' (2005) 1 Journal of Competition Law & Economics 97

Ezrachi A and Gilo D, 'Are Excessive Prices Really Self-Correcting?' (2009) 5 (2) Journal of Competition Law & Economics 249

Farber D A and McDonnell B, 'Why (and How) Fairness Matters at the IP/Antitrust Interface' (2003) 87 Minnesota Law Review 1817

Farrell J et al, 'Standard Setting, Patents, and Hold-Up: A Troublesome Mix' (2007) 74 (3) Antitrust Law Journal 603

Fatur A, EU Competition Law and the Information and Communication Technology Network Industries (Hart Publishing 2012)

Frakes M D and Wasserman M F, 'Does Agency Funding Affect Decisionmaking? An Empirical Assessment of the PTO's Granting Patterns' (2013) 66 Vanderbilt Law Review 67

Furse M, 'Excessive Prices, Unfair Prices and Economic Value: The Law of Excessive Pricing under Article 82 and the Chapter II Prohibition' (2008) European Competition Journal 59

Gans J S, 'When Is Static Analysis a Sufficient Proxy for Dynamic Considerations? Reconsidering Antitrust and Innovation' (2011) 11 (1) Innovation Policy and the Economy 55

Geradin D, Layne-Farrar A and Petit A, EU Competition Law and Economics (Oxford University Press 2012)

Geroski P A, 'Competition in Markets and Competition for Markets' (2003) 3 Journal of Industry, Competition and Trade 151

Gevenaz S, 'Against Immunity for Unilateral Refusals to Deal in Intellectual Property: Why Antitrust Law Should Not Distinguish Between IP and Other Property Rights' (2004) 19 Berkeley Technology Law Journal 741

Ghosh S, 'Patents and the Regulatory State: Rethinking the Patent Bargain Metaphor After Eldred' (2004) 19 Berkeley Technology Law Journal 1315

Gifford D J and Kudrle R T, 'Antitrust Approaches to Dynamically Competitive Industries in the United States and the European Union' (2011) 7 (3) Journal of Competition Law & Economics 695

Gilbert R J and Sunshine S C, 'Incorporating Dynamic Efficiency Concerns in Merger Analysis: The Use of Innovation Markets' (1995) 63 Antitrust Law Journal 569

Gilbert R J, 'Competition and Innovation' in Wayne D Collins (ed) 1 ABA Section of Antitrust Law, Issues in Competition Law and Policy 577, 583 (American Bar Association 2008)

Ginsburg D H and Wright J D, 'Dynamic Analysis and the Limits of Antitrust Institutions' (2012) 78 (1) Antitrust Law Journal 1

Greene H, 'Afterword: The Role of the Competition Community in the Patent Law Discourse' (2002) 69 Antitrust Law Journal 841

Guellec D and van Pottelsberghe de la Potterie B, The Economics of the European Patent System: IP policy for innovation and competition (Oxford University Press 2007)

Hausman D M, Preference, Value, Choice, and Welfare (Cambridge University Press 2012)

Heller M A and Eisenberg R S, 'Can Patents Deter Innovations? The Anticommons in Biomedical Research' (1989) 280 Science 1

Hippel E V, Democratizing Innovation (MIT Press 2005)

Hoerner R J, 'Innovation Markets: New Wine in Old Bottles?' (1995) 64 Antitrust Law Journal 49

Hovenkamp H J, Janis M D and Lemley M A, 'Unilateral Refusals to License in the US' in Lévêque F and Shelanski H (eds), Antitrust, Patents and Copyright – EU and US Perspectives (Edward Elgar 2005) – 'Anticompetitive Settlement of Intellectual Property Disputes' (2003) 87 Minnesota Law Review 1719 – 'Unilateral Refusals to License' (2006) 2 (1) Journal of Competition Law & Economics 1

Hovenkamp H J, Federal Antitrust Policy (3rd ed, Thomson/West 2005) – The Antitrust Enterprise – Principle and Execution (Harvard University Press 2005)

Huang K G and Murray F E, 'Does Patent Strategy Shape the Long-Run Supply of Public Knowledge? Evidence from Human Genetics' (2009) 52 Academy of Management Journal 1193

Huerta De Soto J., The Theory of Dynamic Efficiency (Routledge 2009)

Hugenholtz B, 'Abuse of Database Right: Sole-Source Information Banks under the EU Database Directive' in Lévê que F and Shelanski H (eds), Antitrust, Patents and Copyright - EU and US Perspectives (Edgar Elgar 2005) 203.

Jaffe A B and Lerner J, Innovation and Its Discontents: How are Broken Patent System is Endangering Innovation and Process, and What to Do About it (Princeton University Press 2004)

Kaplow L, 'The Patent-Antitrust Intersection: A Reappraisal' (1984) 97 Harvard Law Review 1813

Kaplow L, 'Extension of Monopoly Power Through Leverage' (1985) 85 Columbia Law Review 515

Kitch E W, 'Patents: Monopolies or Property Rights?' (1986) 8 Research in Law and Economics 31

Kitch E W, 'The Nature and Function of the Patent System' (1977) 20 Journal of Law and Economics 265

Kitch E W, 'Elementary and Persistent Errors in the Economic Analysis of Intellectual Property' (2000) 53 Vanderbilt Law Review 1727

Kovacic W E, 'Competition Policy and Intellectual Property: Redefining the Role of Competition Agencies' in Lévêque F and Shelanski H (eds), Antitrust, Patents and Copyright – EU and US Perspectives (Edward Elgar 2005)

Krattenmaker T G and Salop S C, 'Anticompetitive Exclusion: Raising Rivals' Costs to Achieve Power Over Price' (1986) 96 Yale Law Journal 209

Krier J E, 'The (Unlikely) Death of Property' (1990) 13 Harvard Journal of Law and Public Policy 75

Lande R H, 'Consumer Choice as the Ultimate Goal of Antitrust' (2001) 62 (3) University of Pittsburgh Law Review 503

Landes W and Posner R, The Economic Structure of Intellectual Property Law (Harvard University Press 2003)

Lee P, 'Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer' (2004) 100 California Law Review 1503

Lerner J and Tirole J, 'The Economics of Technology Sharing: Open Source and Beyond' (2005) 19 Journal of Economic Perspectives 99

Lemley M A and Julie E Cohen J E, 'Patent Scope and Innovation in the Software Industry' (2001) 89 California Law Review 1

Lemley M A, 'Property, Intellectual Property and Free Riding' (2005) 83 Texas Law Review 1031

Lemley M A and Shapiro C, 'Patent Holdup and Royalty Stacking' (2007) 85 Texas Law Review 1991

Lemley M A and Weiser P, 'Should Property or Liability Rules Govern Information?' (2007) 85 Texas Law Review 783

Lianos I, 'Competition Law and Intellectual Property Rights: Is the Property Rights' Approach Right?' in John Bell and Claire Kilpatrick (eds) 8 The Cambridge Yearbook of European Legal Studies (Hart Publishing 2006)

Lipsky A B and Sidak G J 'Essential Facilities' (1999) 51 Stanford Law Review 1187

McChesney F S and William F Shughart II W F (eds), The Causes and Consequences of Antitrust: the Public Choice Perspective (University of Chicago Press 1995)

Machlup F and Penrose E, 'The Patent Controversy in the Nineteenth Century' (1950) 10 Journal of Economic History 1

Manne G A and Wright J D, 'Innovation and the Limits of Antitrust' (2010) 6 Journal of Competition Law & Economics 153

Mansfield E, 'R&D and Innovation: Some Empirical Findings' in Zvi Griliches (ed), R&D, Patents and Productivity, National Bureau of National Research (The University of Chicago Press 1984)

Mansfield E, 'Patents and Innovation: An Empirical Study' (1986) 32 Management Science 173

Maskus K E, *Private Rights and Public Problems - The Global Economics of Intellectual Property in the 21st Century* (Peterson Institute for International Economics, 2012)

Mason E S, 'Monopoly in Law and Economics' (1937) 47 Yale Law Journal 34

May C and Sell S K, Intellectual Property Rights – A Critical History (Lynne Reiner 2006)

Merges R P and Nelson R R, 'On the Complex Economics of Patent Scope' (1990) 90 Columbia Law Review 839

Merges R P, 'Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents' (1994) 62 Tennessee Law Review 75

Merges R P, 'Contracting into Liability Rules: Intellectual property Rights and Collective Rights Organizations' (1996) 84 California Law Review 1293

Merges R P, 'As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform' (1999) 14 Berkeley Technology Law Journal 577

Merges R P, 'Institutions for Intellectual Property Exchange: The Case of Patent Pools', in (Rochelle Dreyfuss, ed.) *Intellectual Products: Novel Claims to Protection and Their Boundaries* (Oxford Univ. Press, 2001) 123

Meiners R E and Staaf R J, 'Patents, Copyrights, and Trademarks: Property or Monopoly?' (1990) 13 Harvard Journal of Law and Public Policy 911

Mossof A, 'The Rise and Fall of the First American Patent Thicket: The Sewing Machine War of the 1850s' (2011) 53 Arizona Law Review 165

Motta M and de Streel A, 'Exploitative and Exclusionary Excessive Prices in EU Law' in Claus-Dieter Ehlermann and Isabela Atanasiu (eds), What is an Abuse of a Dominant Position? (Hart Publishing 2006)

Murray F and O'Mahony S, 'Exploring the Foundations of Cumulative Innovation: Implications for Organization Science' (2007) 18 Organization Science 1006

Murray F and Stern S, 'Do Formal Intellectual Property Rights Hinder the Free Flow of Scientific Knowledge? An Empirical Test of the Anti-Commons Hypothesis' (2007) 63 Journal of Economic Behavior and Organization 648

Nordhaus W D, Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change (MIT Press 1969)

O'Connor S M, 'IP Transactions as Facilitators of the Globalized Innovation Economy' in Rochelle C. Dreyfuss, Diane L Zimmerman and Harry First (eds), Working Within the Bound-

aries of Intellectual Property-Innovation Policy for the Knowledge Society (Oxford University Press 2010)

Odudu O, 'Intellectual Property Rights' in Bellamy and Child: European Union Law of Competition (Oxford University Press 2013)

Ordover J A, 'Economic Foundations and Considerations in Protecting Industrial and Intellectual Property' (1984) 53 (3) Antitrust Law Journal 503

Papandropoulos P, 'Implementing an effects-based approach under Article 82' (1998) Concurrences 1, 3

Paulis E, 'Article 82 EC and Exploitative Conduct' in Claus-Dieter Ehlermann and Mel Marquis (eds), European Competition Law Annual 2007: A Reformed Approach to Article 82 EC (Hart Publishing 2008) 515

Peritz R J, 'The "Rule of Reason" in Antitrust Law: Property Logic in Restraint of Competition' (1989) 40 Hastings Law Journal 285

Pleatsikas C and Teece D, 'The analysis of market definition and market power in the context of rapid innovation' (2001) 19 International Journal of Industrial Organization 665

Posner R, Economic Analysis of Law (6th ed, Aspen 2003) 47 – Antitrust Law (University of Chicago Press 2001)

Priddis S and Constantine S, 'The Pharmaceutical Sector, Intellectual Property Rights, and Competition Law in Europe' in Steven Anderman and Ariel Ezrachi (eds) Intellectual property and Competition Law – New Frontiers (Oxford University Press 2011)

Rai A K and Eisenberg R E, 'Bayh-Dole Reform and the Progress of Biomedicine' (2003) 66 Law and Contemporary Problems 289

Rai A K, 'Patent Validity Across the Executive Brand: Foundations for Policy Development' (2012) 61 Duke Law Journal 101

Raustiala K and Sprigman C, 'The Piracy Paradox: Innovation and Intellectual Property in Fashion Design' (2006) 92 Vanderbilt Law Review 1687

Rhoten D and Powell W W, 'Public Research Universities: From Land Grant to Federal Grant to Patent Grant Institutions' in Diana Rhoten and Craig J Calhoun (eds), Knowledge Matters (Columbia University Press 2010)

Ritter C, 'Refusal to Deal and Essential Facilities: Does Intellectual Property Require Special Deference Compared to Tangible Property?' (2005) 28 World Competition 281

Röller L H, 'Exploitative Abuses' in Claus-Dieter Ehlermann and Mel Marquis (eds) European Competition Law Annual 2007: A Reformed Approach to Article 82 EC (Hart Publishing 2008) 525

Romer P M, 'When Should We Use Intellectual Property Rights?' (2002) 92 American Economic Review 213

Rubinfeld D L and Maness R, 'The Strategic Use of Patents: Implications for Antitrust' in Lévêque F and Shelanski H (eds), Antitrust, Patents and Copyright – EU and US Perspectives (Edward Elgar 2005)

Samuelson P, 'Intellectual Property Arbitrage: How Foreign Rules Can Affect Domestic Protections' (2004) 71 University of Chicago Law Review 223

Scherer F M, 'The Innovation Lottery' in Dreyfuss R C, First H and Zimmerman D L (eds), Expanding the Boundaries of Intellectual Property (Oxford University Press 2001)

Schumpeter J A, The Theory of Economic Development (London, Transaction Pub 2005, first published by Harvard University Press in 1934) – Capitalism, Socialism and Democracy (1942, published by Harper & Bros. in 1950) – History of Economic Analysis (Routledge 1986, first published in 1954)

Scrothcmer S, 'Standing on the Shoulders of Giants: Protecting Cumulative Research and the Patent Law' (1991) 5 Journal of Economic Perspectives 29 – Innovation and Incentives (MIT Press 2004) – 'Standing on the Shoulders of Giants: Protecting Cumulative Innovators' in Suzanne Scotchmer S, Innovation and Incentives (MIT Press 2005)

Segal I and Whinston M D, 'Antitrust in Innovative Industries' (2007) 97 American Economic Review 1703

Shafir E, Simonson I and Tversky A, 'Reason-Based Choice' (1993) 49 Cognition 11

Shapiro C, 'Antitrust Limits to Patent Settlements' (2003) 34 Rand Journal of Economics 391

Shapiro C, 'Antitrust, Innovation, and Intellectual Property – Testimony Before the Antitrust Modernization Commission' (8 November 2005)

Shavell S, Foundations of Economic Analysis of Law (Belknap Press of Harvard University Press 2004) 93

Shelanski H A and Katz M L, 'Mergers and Innovation' (2007) 74 Antitrust Law Journal 1

Sherman B and Bently L, The Making of Modern Intellectual Property Law (Cambridge University Press 1999)

Sidak G J, 'Holdup, Royalty Stacking, and the Presumption of Injunctive Relief for Patent Infringement: A Reply to Lemley and Shapiro' (2008) 92 Minnesota Law Review 714

Sidak G J and Teece D J, 'Dynamic Competition in Antitrust Law' (2009) 5 (4) Journal of Competition Law & Economics 581

Strandburg K J, 'Curiosity-Driven Research and University Technology Transfer' in Gary D Libecap (ed) (2005) 16 Advances in the Study of Entrepreneurship, Innovation and Economic Growth 97

Strandburg K J, 'Users as Innovators: Implications for Patent Doctrine' (2008) 79 University of Colorado Law Review 467

Teece D J, 'Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy' (1986) 15 Research Policy 285

Teece D J, Pisano G and Shuen A, 'Dynamic Capabilities and Strategic Management' (1997) 18 Strategic Management Journal 509

Teece D J, 'Favoring Dynamic over Static Competition: Implications for Antitrust Analysis and Policy' in Geoffrey A Manne and Joshua D Wright, Competition Policy and Patent law under Uncertainty (Cambridge University Press 2011)

Temple Lang J, 'Defining Legitimate Competition: Companies' Duties to Supply Competitors, and Access to Essential Facilities' (1994) 18 (2) Fordham International Law Journal 437

Trebilcock M J, The Common Law of Restraint of Trade (Sweet & Maxwell 1986)

Ullrich H, 'Expansionist Intellectual Property Protection and Reductionist Competition Rules: a TRIPS Perspective' in Keith Maskus (ed), International Public Goods and Transfer of Technology (Cambridge University Press 2005)

Venegas V B, 'Shifting Towards a Dynamic Efficiency Test?: Evaluating Licensing Agreements under Antitrust Law' in Steven Anderman and Ariel Ezrachi (eds) Intellectual property and Competition Law – New Frontiers (Oxford University Press 2011)

Walsh J P, Arora A and Cohen W M, 'Effects of Research Tool Patents and Licensing on Biomedical Innovation' in Wesley M Cohen and Stephen A Merrill (eds), Patents In The Knowledge-Based Economy (National Research Council 2003)

Westkamp G, 'Protecting Databases under US and European Law: Methodical Approaches to the Protection of Investments between Unfair Competition and Intellectual Property Concepts' (2003) 34 International Review of Industrial Property and Copyright Law 772

Whinston M D, 'Tying, Foreclosure and Exclusion' (1990) 80 American Economic Review 837

Wright J D, 'Antitrust, Multidimensional Competition and Innovation – Do we Have an Antitrust-Relevant Theory of Competition Now?' in Manne G A and Wright J D (eds), Competition Policy and Patent law under Uncertainty (Cambridge University Press 2011)

Policy Statements

OFT 1390, Competition and Growth (November 2011)

US DOJ and FTC, 'Antitrust Enforcement and Intellectual Property Rights: Promoting Innovation and Competition' (April 2007)

FTC, 'Pay- for- Delay: When Drug Companies Agree not to Compete available at http://www.ftc.gov/opa/reporter/competition/payfordelay.shtml

Office of Management and Budget, Office of Information and Regulatory Affairs Q & As, http://www.whitehouse.gov/omb/OIRA_QsandAs (discussing Executive Order 12866 and amendments); OMB Circular A-119, http://www.whitehouse.gov/omb/circulars_a119

Electronic Papers

AUTM, 'Nine Points to Consider in Licensing University Technology' (6 March 2007) <http://www.autm.net/Nine_Points_to_Consider.htm> accessed 1 August 2011

Boldrin M and Levine D K, 'The Case Against Patents' (September 2012) Federal Reserve Bank of St Louis Working Paper 2012–035A available at <http://www.research.stlouisfed.org/wp/2012/2012–035.pdf>

Carlton D W and Gertner R H, 'Intellectual Property, Antitrust and Strategic Behavior' NBER Working Paper Series, Working paper 8976, available at < http://www.nber.org/papers/w8976 >

Fackelmann C R, 'Dynamic Efficiency Considerations in EC Merger Control. An Intractable Subject or a Promising Chance for Innovation?' Oxford Centre for Competition Law and Policy Working Paper No. L-09/06

Gault F and von Hippel E, 'The Prevalence of User Innovation and Free Innovation Transfers: Implications for Statistical Indicators and Innovation Policy' MIT Sloan School of Management. Research Paper No. 4722–09 (January 2009) available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1337232

Geradin D, 'Ten Years of DG Competition Effort to Provide Guidance on the Application of Competition Rules to the Licensing of Standard-Essential Patents: Where Do We Stand?' (21 January 2013), available at SSRN: <http://ssrn.com/abstract=2204359> or <http://dx.doi.org/10.2139/ssrn.2204359>

Hovenkamp H, 'The Walker Process Doctrine: Infringement Lawsuits as Antitrust Violations' University of Iowa Legal Studies Research Paper No. 08–36 (1 September 2008) available at <http://ssrn.com/abstract=1259877>

Lianos I and Genakos C, 'Econometric Evidence in EU Competition Law: An Empirical and Theoretical Analysis' (1 October 2012) CLES Research Paper series 06/12. Available at SSRN: <http://ssrn.com/abstract=2184563> or <http://dx.doi.org/10.2139/ssrn.2184563>

Lianos I, 'Some Reflections on the Question of the Objectives of EU Competition Law' (April 2013) CLES Research Paper series 03/2013. Available at SSRN: <http://papers.ssrn.com/sol3/papers.cfm?abstract id=2235875>

Murray F, et al, 'Of Mice and Academics: Examining the Effect of Openness on Innovation' (March 2009), NBER Working Paper Series, Vol. w14819, 2009, available at <http://ssrn.com/abstract=1369055>

Posner R, 'Why There are Too Many Patents in America', The Atlantic (12 July 2012) <http://www.theatlantic.com/business/archive/2012/07/why-there-are-too-many-patents-in-america/259725/>

Reports

Australian Government, Productivity Commission Report, Restrictions on the Parallel Importation of Goods (2009)

National Research Council of the National Academies, Committee on Management of University Intellectual Property, Lessons from a Generation of Experience, Research and Dialogue, 'Managing University Intellectual Property in the Public Interest' (The National Academy Press 2010)

IPO, The Role of the Intellectual Property Office (July 2012) available at <http://www.ipo.gov.uk/hargreaves-roleofipo.pdf>; IPO, Response to the Informal Consultation on the Role of the Intellectual Property Office (March 2013) available at <http://www.ipo.gov.uk/response-2013-roleipo.pdf>

Panel Report, China-Measures Affecting the Protection and Enforcement of Intellectual Property Rights, WT/DS362/R (January 26, 2009)

Panel Report, Canada-Patent Protection of Pharmaceutical Products, WT/DS114/R (March 17, 2000)

Agenda and reports of the Chief Economist: http://www.uspto.gov/ip/officechiefecon/

Office of the Chief Economist: http://www.uspto.gov/ip/officechiefecon

Office of Management and Budget, Office of Information and Regulatory Affairs Q & As, http://www.whitehouse.gov/omb/OIRA_QsandAs (discussing Executive Order 12866 and amendments); OMB Circular A-119, http://www.whitehouse.gov/omb/circulars_a119

US Department of Commerce, 'Intellectual Property and the US Economy: Industries in Focus' available at http://www.uspto.gov/news/publications/IP_Report_March_2012.pdf

FTC Staff Study, How Drug Company Pays-Offs Cost Consumers Billions (January 2010), available at http://www.ftc.gov/os/2010/01/100112payfordelayrpt.pdf

FTC, Generic Drug Entry Prior to Patent Expiration: An FTC Study (July 2002), available at http://www.ftc.gov/os/2002/07/genericdrugstudy.pdf

Bush V, 'Science- The Endless Frontier: A Report to the President On A Program for Postwar Scientific Research' (United States Government Printing Office, 1945)

Hargreaves I, 'Digital Opportunity – A Review of Intellectual Property and Growth' (May 2011), available at <http://www.ipo.gov.uk/ipreview-finalreport.pdf>

López A, 'Innovation and Appropriability, Empirical Evidence and Research Agenda' in The Economics of Innovation (WIPO 2009), available at <http://www.wipo.int/ip-development/en/economics/pdf/wo_1012_e_ch_1.pdf>

Röller L H and Buigues P A, 'The Office of the Chief Competition Economist at the European Commission' (May 2005)

Salop S C, 'Efficiencies in Dynamic Merger Analysis' (1995), Statement at FTC Hearings on Global and Innovation-Based Competition, available at www.ftc.gov/opp/global/saloptst.htm

Tepperman A and Sanderson M, 'Innovation and Dynamic Efficiencies in Merger Review' (Canada, Competition Bureau 2007), available at <http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/02378.html#key_concepts

Wilson B B, 'Patent and Know-How License Agreements: Field of Use, Territorial, Price and Quantity Restrictions' Address Before the Fourth New England Antitrust Conference (6 November 1970)

Williams H L, 'Intellectual Property Rights and Innovation: Evidence from the Human Genome' (Working Paper No. 16213, National Bureau of Economic Research Working Paper, 2010) <http://www.nber.org/papers/w16213>

European Commission Press Release, MEMO/09/322: Antitrust: Commission opens formal proceedings against Les Laboratoires Servier and a number of generic pharmaceutical companies, available at <http://europa.eu/rapid/press-release_MEMO-09–322_en.htm> (8 July 2009)

Press Releases

Commission Press Release IP/12/1233, Commission Presents new Rethinking Education Strategy available at http://europa.eu/rapid/press-release_IP-12–1233_en.htm (20 November 2011)

Commission Press Release, IP/12/1149, Commission sends Statement of Objections to Microsoft on non-compliance with browser choice commitments (24 October 2012) available at http://europa.eu/rapid/press-release_IP-12–1149_en.htm

European Commission, Commission opens proceedings against Samsung, IP/12/89 (31 January 2012), available at http://europa.eu/rapid/press-release_IP-12–89_en.htm

European Commission, Commission opens proceedings against Motorola, IP/12/345 (3 April 2012), available at <http://europa.eu/rapid/press-release_IP-12–345_en.htm>

European Commission, Commission sends Statement of Objections to Lundbeck and others for preventing market entry of generic antidepressant medicine, IP-12–834 (25 July 2012)