INTRODUCTION

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I. Introduction to the Economics and Law of Intellectual Property

Intellectual property (IP) is concerned with the product of the mind, with intellectual activity transformed by custom and law into a commodity capable of being appropriated and therefore traded. Customs, such as those institutionalised in the guild system which effectively protected knowledge of products and techniques, over the centuries have come to be replaced by laws. Various types of law have achieved this transformation: tort (trade secrets), statutory law (copyright, patent, design and trademarks) and the law of contract. Without institutional protection, people's ideas, creations and inventions would be a common resource available to the whole community. IP law is the main device that has been adopted in industrialised countries for offering this protection. Its role is to foster inventiveness and creativity, thus encouraging the economic and cultural development of society. The dual aims of IP law are to provide an incentive to innovation on the one hand and to encourage the disclosure of innovation on the other hand. This duality leads to a trade-off between incentive and access: the greater is the strength of the incentive, the less access to the resulting information, and *mutatis mutandis*. That trade-off lends itself to legal analysis of the balance of interests between different groups in the population and to economic analysis of the opportunity cost of one or another course of action.

In economic terms, IP law privatises public knowledge, creates scarcity where it otherwise would not exist and restricts access to information goods. It enables the author of an idea, invention or creation to control its supply and reap the reward to the human capital invested, thereby creating an incentive to produce. The reward may be a financial payment, recognition or another non-pecuniary return. Some creators and inventors, for example, artists may be less influenced by financial rewards than by non-financial ones. The essentials of the economic analysis of IP are the appropriation of rewards and the effect they have on market supply and demand.

There are several layers of economic analysis of IP. At the most general level, there is the economic case for privatisation. As with other forms of property, such as the private ownership of land, economists have long debated the economic rationale for property laws; the modern economic literature on property rights is an extension of that enquiry. The case rests on the efficiency of private ownership as a means of discouraging overuse of common property - the Tragedy of the Commons - and of encouraging investment to improve its productivity. Once property laws are established, the price mechanism working in competitive markets will then lead to the best use of resources. This paradigm is applied to IP: patents allow the inventor to appropriate the rewards of ingenuity, copyrights do the same for creators of artistic works, and trademarks allow producers to benefit from their integrity in maintaining the quality of their products. Through appropriability, the statutory protection of IPs fosters innovation and its exploitation by entrepreneurs, thus leading to economic growth.

Another layer of economic analysis is to be found in the law and economics approach to IP law, in which individual legal doctrines are analysed for their economic rationale. The underlying tenet to this approach is that the economic purpose of law is the promotion of social welfare where the market fails to achieve that effect spontaneously. The invisible hand of the marketplace is aided by the visible hand of the law.

Yet another layer of the economics of IP is empirical analysis. We emphasise this aspect in our choice of articles because we regard empirical evidence as an indispensable input to law-making. The trade-off between incentive and access to IP is seen in terms of economic costs and benefits and any conclusions about the desirability of IPs, or of particular features of IP law, eventually reduce to the quantification of those costs and benefits. However, despite a considerable body of empirical studies of the effect of IPs (almost exclusively on patents) there is no consensus about the impact of IPs on innovation and growth.

A final layer is IP as part of economic policy-making. This includes domestic competition policy and law

and international agreements, such as TRIPS (Trade-Related IPs), which govern foreign trade. All these layers of discourse are represented in this collection.

As may be seen from the Table of Contents, the economics of IP is dominated by patents. Our personal research interests do not lie in patents; one of us specialises in copyrights and the other in trademarks. Moreover, one is an economist and the other is a lawyer by training. We think this diversity adds interest to the selection of articles and our way of looking at them. As the collection shows, there is a great deal more to the economics of IP than the study of patents.

The articles reprinted here are concerned only with the economic aspects of IP; they do not include legal treatments per se, though many explain legal details to the reader. The collection is intended for an audience of economists and lawyers. In this Introduction, we provide a basic overview of the economics and IP law that is needed to read the articles. We also reprint introductory articles that contain concise summaries of the law and economics of individual IPs (Besen[1], Raskind[2], Gordon and Bone[3], Kitch[4], Friedman[5], Economides[6]). The book is organised according to individual IPs, copyright, patent, trade secrets, trademarks and the final volume contains articles on the role of IP in competition and international trade. In this Introduction, articles reprinted are indicated by the author's name followed by the reference (in bold); the Roman numbers are the volume number and the Arabic numbers are the chapter numbers in each volume.

The Basic Concepts of IP Law

The purpose of this section is to provide a basic guide to the leading features of the different types of IPs. Patent, copyright and trademark law is statutory law (meaning that it was enacted by the legislature); it is national law and therefore varies across countries. Other aspects of IP protection are civil and may be state law; passing off, trade secrets, standardisation and competition law fall into this category. In federal countries, such as the USA, statutory IP law is federal law. The basic international IP-treaties - Berne for Copyright, Paris for industrial property (patents, trademarks and the rest) - provide many of the standard features of IP rights, resulting in an elementary harmonisation. There are also several supra-national rights, especially within the European Union, where there now exist a Community-wide Trademark and a Plant Breeder's Right, with a Community-wide patent not too far away. Patents are further `internationalised' through a number of separate treaties, such as IPC (providing an International Patent Classification), PCT (Patent Cooperation Treaty, providing an international application option) and, within Europe, the EPC (European Patent Convention, providing an harmonised granting procedure). International conventions strive to establish similar treatment for national and non-national individuals and enterprises within signatory countries and international and inter-regional organisations - the World Intellectual Property Organisation (WIPO), the World Trade Organisation (WTO), the European Union - to seek to harmonise national law to promote fair competition and international trade.

Despite this diversity, it is possible to generalise about IP laws. All IPs embody a degree of monopoly; its strength can be usefully thought of in terms of three basic elements: threshold (what is needed to qualify),

1. Besen, S.M. (1998), `Intellectual Property', in P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, Volume 2, London: Macmillan, 348-52.
2. Raskind, L.J. (1998), `Copyright', in P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, Volume 1, London: Macmillan, 478-83.
3. Gordon, W.J. and Bone, R.G. (2000), `Copyright', in B. Bouckaert and G. de Geest (eds.), *Encyclopedia of Law and Economics*, Volume II, Chapter 1610, Cheltenham: Edward Elgar, 189-215.
4. Kitch, E.W. (1998), `Patents', in P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, Volume 3, London: Macmillan, 13-17.
5. Friedman, D.D. (1998), `Trade Secret', in P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, Volume 3, London: Macmillan, 604-7.
6. Economides, N.S. (1998), `Trademarks', in P. Newman (ed.), *The New Palgrave Dictionary of Economics and the Law*, Volume 3, London: Macmillan, 601-3.

scope (the extent of coverage) and duration (how long protection lasts). These elements are summarised for the main IPs as follows:

Copyrights: Copyright applies to a range of literary and artistic works in fixed form. The threshold requirement for copyrightable works is originality. Independent creation is allowed by the scope of copyright law but the scope is subject to limitations and exceptions. The duration of copyright is 70 years after the death of the author (50 years for neighbouring rights) but moral rights have different time limits.

Patents: Patents apply to ideas for industrial products and processes. The threshold requirements for patentability are novelty, an inventive step and industrial application; the scope relies on interpretation and originates from the patent claims; `prior use' provides a limitation of the patent right. The maximum duration of a patent is 20 years (under the EPC: plus 5 years for pharmaceuticals) and there are annual renewal fees.

Trademarks: Trademarks apply to products and services; they must be distinctive and not deceptive and there must be no earlier rights or multiple appearances. The scope of a trademark is determined by a test of (likelihood of) confusion, association or dilution. Duration is unlimited subject to 10 year renewal fees.

The threshold requirement for a patent is more stringent than that of a copyright: its monopoly is therefore stronger and its duration shorter; thus these elements are interrelated. The economic justification for this is to be found in Landes and Posner.[7] As regards scope, this is generally laid down in statutes, which are revised from time to time to encompass new developments, mainly new technologies; copyright law, in particular, has been subject to many changes to cope with a succession of copying innovations and products. Patents now include biotechnology, algorithms and business methods; trademarks have been extended to cover colours and smells. Breadth of protection of the different IPs is a topic of economic analysis, especially in relation to patents. Although patent and copyright law have adapted to a host of technical changes and to economic, political, social and cultural change, they have not been able to absorb every type of development; there remain the so-called *sui generis* rights (meaning ones specific to particular items), for example Plant Breeders, Database and Semiconductor Chips rights. Legal hybrids between copyrights and patents also defy easy classification; according to Reichman[8] this can result in the case of new technologies (for example, industrial design, computer chips and software and databases) in alternatively too much or too little protection under patent or copyright laws or in resorting to specially created rights.

Another way to generalise about IPs is to focus on the different functions that groups of rights have, namely:

- to encourage artistic expression and design: copyright, neighbouring rights, design rights;
- to encourage certain information technologies: copyright, computer chip protection, databases;
- to encourage technical innovation: patents, utility rights, plant breeders' rights;
- to improve consumer information: trade names, trade marks, design rights;
- to protect against imitation: tort of passing off, misappropriation;
- and to promote competition: competition law cooperation/standardisation.

Within each group we can find common features. Thus, the duration and moral rights that characterise copyright and some related rights may be explained by the person-oriented character of these rights; the

7. Landes, W.M. and Posner, R.A. (1989), `An Economic Analysis of Copyright Law', *Journal of Legal Studies*, **XVIII** (2), June, 325-63.
8. Reichman, J.H. (1994), `Legal Hybrids Between Patent and Copyright Paradigms', *Columbia Law Review*, **94**, 2432-558.

author's copyright has the duration of 70 years after the death of the author (*post mortem autoris*). Elements such as limited duration, annual costs and compulsory licensing go with the innovation-promoting character of patents and other rights concerning technical matter. The unlimited duration of yet another group IPs has to do with their function in the process of communication, the transmission of knowledge and information, which is unlimited in time.

IP and Monopoly

The monopoly conferred by IP law gives the owner (of a useful invention, a literary or artistic work, a branded product, and so on) the right to exclude other users and therefore privatises what would otherwise be public. In overcoming the market failure of free-riding, IP law thus creates market failure through monopoly. There is, however, some difference in the economist's and the lawyer's understanding of monopoly (Dam[9], Kitch[10]). In legal terms, the strength of the monopoly varies according to the threshold, scope and duration of the IP, as indicated above. Copyrights are a weak monopoly because there could be legal independent creation of the same work; moreover, the author may well produce several works that are close substitutes. A copyright-owner is therefore a monopolistic competitor rather than a pure monopolist (MacQueen and Peacock[11]). A patent is a much stronger monopoly as the idea (the `inventive step') is monopolised, thus reducing the ability of a competitor to make a substitute good (Kitch[12], Dam[13]). Trademarks and trade names are weak monopolies because they do not prevent the production of substitutes, they merely protect the identity of the producer. In economics, the concept of monopoly is defined in relation to the freedom the firm has to set its price or, alternatively, it is defined in terms of market contestability, which depends upon entry and exit costs; the number of firms in the market does not necessarily control either. In competition law, it is domination of the market that is the criterion for monopoly. In fact, `pure monopoly', meaning a single firm in a market, is rare and anti-trust cases are far more likely to be dealing with oligopoly where a few large firms, typically producing brand products (often protected by trademarks and trade names), dominate the market and restrain competition and the entry of new firms. Measures of market concentration, such as the US Herfindahl Index, are therefore necessary in anti-trust cases.

Thus, there are differences in the economic and legal treatment of monopoly and between the effect different IPs have on markets in terms of the degree of monopoly to which they give rise. The concept of monopoly is therefore a controversial question in the economic analysis of IPs and also in relation to competition law.

Finally, it should be noted that economists regard one aspect of monopoly as beneficial, so-called `natural' monopoly, which exists when economies of scale in production lead to falling average costs and to low or even zero marginal costs. Network economies of consumption may give rise to equivalent economic (and social) benefits. In these circumstances, which appear to be prevalent in the cultural industries and other information goods industries, competition by more firms would impose costs and therefore lead to higher prices. This may lead to legal exemption on the grounds that the public interest is better served by regulated natural monopolies.

9. Dam, K.W. (1994), `The Economic Underpinnings of Patent Law', *Journal of Legal Studies*, **XXIII** (1, Part 1), January, 247-71.
10. Kitch, E.W. (1986), `Patents: Monopolies or Property Rights?', *Research in Law and Economics*, **8**, 31-49.
11. MacQueen, H.L. and Peacock, A. (1995), `Implementing Performing Rights', *Journal of Cultural Economics*, **19** (2), 157-75.
12. Kitch, E.W. (1977), `The Nature and Function of the Patent System', *Journal of Law and Economics*, **XX** (1), April, 265-90; Kitch, E.W. (1986), op. cit. supra note 10.
13. Dam, K.W. (1994), op. cit. supra note 9.

II. The Economic Analysis of IP

In a comprehensive survey of economic theories of the whole field of IP, Menell[14] distinguishes two paradigms: utilitarian and non-utilitarian theories. Utilitarian theories have as their objective the maximisation of economic wealth through innovation and invention in the long run, or, in the short run, the achievement of economic efficiency; these theories are applied to patents, copyrights, trademarks and trade secrets. Non-utilitarian theories stress natural rights and concepts of justice as the basis for IP laws and are particularly relevant to copyright and related rights. As these volumes are concerned with the economic analysis of IP, our selection for these volumes necessarily emphasises the utilitarian paradigm. The utilitarian approach is embodied in what is called for short Anglo-Saxon law, that is the underlying jurisprudence of the USA, the UK and those countries that inherited English law, for example, Australia, New Zealand, most of Canada, India and countries in Africa. This approach does not always sit comfortably with European countries and those on other continents that follow the European legal tradition of civil law. Moreover, the economic rationale provides only a partial view of some IP law, and this is particularly true of copyright. Menell provides a thoughtful survey of the non-utilitarian theories of IP.

The instrumental approach questions the need for IP-rights in the light of the economic functions they are supposed to serve, the incentive to create and invent and the stimulus to economic growth and welfare. Questioning the rationale of IP law has a long history in economics; the article by Hadfield[15] surveys economic writings on copyright and patents by Smith, Bentham, J.S. Mill, Macaulay, Sidgwick and Schumpeter and the patent controversy of the nineteenth century is analysed in Machlup and Penrose[16], Machlup[17], David[18] and Plant[19]. The argument put forward in many of these writings is that IP law is unnecessary because market devices exist that protect invention and creativity; being first to market offers lead-time advantages to producers that in effect gives them monopoly power for long enough to enable them to appropriate returns and corner the market. Not every inventor or author needs IP law for encouragement and those who do not merely reap economic rents from it.

The case for the protection of information by IP law rests on the assumption that it cannot be kept secret or used to get a sufficient head start on competitors. Friedman[20] argues that in the area of patent law some information can be successfully kept secret, though at a cost. Process innovations offer more scope for secrecy than product innovations, which may be subject to reverse engineering, but that does not mean that keeping secrets is easy. Mansfield[21] believes that for both processes and products the odds are better than

14. Menell, P.S. (1999), `Intellectual Property: General Theories', entry 1600 in B. Bouckaert and G. de Geest (eds.), *Encyclopaedia of Law and Economics*, Cheltenham, UK and Northampton, US: E. Elgar.
15. Hadfield, G.K. (1992), `The Economics of Copyright: An Historical Perspective', *Copyright Law Symposium*, **38**, 1-46.
16. Machlup, F. and Penrose, E. (1950), `The Patent Controversy in the Nineteenth Century', *Journal of Economic History*, **X** (1), May, 1-29.
17. Machlup, F. (1958), *An Economic Review of the Patent System: Study of the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary*, US Senate, 85th Congress, 2nd Session, Study Number 15, Washington: United Stated Government Printing Office, 1-86.
18. David, P.A. (1993), `Intellectual Property Institutions and the Panda's Thumb: Patents, Copyrights, and Trade Secrets in Economic Theory and History', in M.B. Wallerstein, M.E. Mogee and R.A. Schoen (eds.), *Global Dimensions of Intellectual Property Rights in Science and Technology*, Chapter 2, Washington, DC: National Academy Press, 19-61.
19. Plant, A. (1934), `The Economic Aspects of Copyright in Books', *Economica*, **1**, May, New Series, 167-95; Plant, A. (1934), `The Economic Theory Concerning Patents for Inventions', *Economica*, **1**, February, New Series, 30-51.
20. Friedman, D.D. (1998), op. cit. supra note 5.
21. Mansfield, E. (1986), `The R&D Tax Credit and Other Technology Policy Issues', *American Economic Review*, **76** (2), 190-94.

50-50 that a development decision will leak out in less than 18 months, but that if it takes three years or more before a new product or process is developed and commercialized, there is a better-than-even chance that the decision will leak out before the innovation project is even half completed (see also Reinganum[22]). The rapidly shortening life-cycle of new products raises the importance of getting a sufficient head start on competitors. If costs have to be recovered in a relative short period, other things being equal, the strategy of relying solely on being first to the market in order to capture the returns on the research investment becomes less attractive. However, it has been argued that in the micro-electronics industry, where product cycles have shortened dramatically, patents have become less and less used (Kaufer[23], Scotchmer[24]).

Some economists, especially neo-Austrians, put their trust in entrepreneurial activity to find ways of appropriating the benefits of information in ways other than that of selling it directly to consumers (Palmer[25]). Neo-Austrians hesitate to grant IP rights, although they are willing to codify such rights if they are the product of an evolutionary process of interactions among interested parties (MacKaay[26], Palmer[27]). The question of whether patent and copyright law is redundant, therefore, depends on the ability of entrepreneurs to find alternative methods of internalising externalities. Palmer[28] lists technological fences, tie-ins and complementary goods, contractual association arrangements and marketing strategies as means of internalisation. This way of economic thinking makes it clear that granting IP rights is not the only way of protecting innovators against free-riders and, even though the mechanisms mentioned above only limit the need for an IPs, economic analysis clearly raises questions about the proper range and scope of IPs.

We now turn to a more detailed analysis of the different economic models used in the analysis of IPs.

Welfare Economics Approach

Welfare analysis was applied to markets for information goods in the now classic article by Arrow[29]. Arrow's insight was that information is a public good; it is non-rival, as consumption by one individual does not reduce the amount available for another and it is non-excludable, because it is not possible to restrict consumption of the good to individuals who can be made to pay (as argued above, however, excludability may depend on the technological possibilities for restricting access). Pure public goods have both features. The terms `publicness' or `quasi-public' goods are frequently used interchangeably with the term social externality to indicate the presence to some degree of one or another of these features. Where they exist, private incentives to entrepreneurs are insufficient to induce investment because they could not recoup their costs from market revenues; free-riders would wait for others to provide the good so they can enjoy the benefits *gratis* (or at a much lower price). The public good nature of information implies that it is not fully appropriable:

22. Reinganum, J.F. (1989), `The Timing of Innovation: Research, Development and Diffusion', in R. Schmalensee and R.D. Willig (eds.), *Handbook of Industrial Organization*, Volume I, Chapter 14, Amsterdam: Elsevier, 850-908.
23. Kaufer, E. (1986), `The Incentives to Innovate under Alternative Property Rights Assignments with Special Reference to the Patent System', *Journal of Institutional and Theoretical Economics*, **142** (1), March, 210-26.
24. Scotchmer, S. (1996), `Patents as an Incentive System', in B. Allen (ed.), *Economics in a Changing World: Proceedings of the Tenth World Congress of the International Economic Association*, Moscow, Volume 2, Chapter 12, Houndmills: Macmillan, 281-96.
25. Palmer, T.G. (1989), `Intellectual Property: A Non-Posnerian Law and Economics Approach', *Hamline Law Review*, **12** (2), Spring, 261-304.
26. Mackaay, E. (1990), `Economic Incentives in Markets for Information and Innovation', *Harvard Journal of Law and Public Policy*, **13** (3), Summer, 867-909.
27. Palmer, T.G. (1989), op. cit. supra note 25.
28. Palmer, T.G. (1989), op. cit. supra note 25.
29. Arrow, K.J. (1962), `Economic Welfare and the Allocation of Resources for Invention', in: *The Rate and Direction of Economic Activity: Economic and Social Factors*, National Bureau of Economic Research Conference Series, Princeton.

it is, as the saying goes, subject to market failure.

Market failure, however, requires careful definition. Within static welfare analysis, the underlying objective of society at any point in time (that is, for a given state of technology, consumer preferences and distribution of income) is assumed to be the maximisation of economic welfare; this is achieved through the efficient allocation of resources, which, according to Adam Smith's `invisible hand', is attained by a well-functioning, competitive market economy in which private incentives alone lead to maximum social welfare. Market failure occurs when they do not do so.

There are two distinct frameworks in welfare economics for analysing welfare maximisation: the general equilibrium model of Pareto Optimality and partial equilibrium model of Pigou - so-called Pigovian welfare economics. Pareto Optimality, the rule whereby welfare cannot be unambiguously improved given the existing distribution of endowments among individuals, is an ideal that requires general equilibrium conditions: perfect competition in all product and factor markets now and in the future, no externalities or missing markets and zero transaction costs. A Pareto Improvement is some re-arrangement of existing technology, economic organisation or laws that increases welfare for some member of society without reducing it for others; however, it is recognised as being virtually inapplicable in practice, since almost every possible rearrangement makes at least one person worse off, thereby raising the insurmountable problem of how to compare one person's loss with another's gain (the interpersonal comparison of utility). The concept of an actual Pareto Improvement therefore has been modified by the Hicks-Kaldor compensation test into a Potential Pareto Improvement, in which someone who is potentially worse-off due to another's potential gain voluntarily accepts financial compensation as a `bribe' in recompense for the harm and so consents to the welfare-improving change. The notion of voluntary side-payments is, of course, well-known to lawyers and it is no surprise that Posner[30] places so much emphasis on the law being able to achieve this type of improvement. The judge and law-maker become the `visible hand', guiding the economy by means of good law towards an optimum. The Chicago School thus emphasises the creation of conditions through the legal process, in which voluntary exchange can be fostered, improving the working of markets and the price mechanism's ability to guide society to an optimal welfare outcome.

Within the static welfare paradigm, though, IPs have to be regarded as a `second-best' solution, that is achieving a welfare improvement in sub-optimal conditions. However, it is frequently ignored that no move can somehow magically switch a second-best into a first-best Pareto Optimal outcome. The effect of IPs on markets is both an incentive one of encouraging innovation and creativity and a monopolistic one of raising the price of the work to the user and so reducing access - a simple and familiar trade-off of costs and benefits. The introduction of the IP can never be Pareto Optimal because it is a barrier to entry and leads to a monopolistic price; nor are the results improved by compensation to users, even taking into account that having more information goods is, generally, welfare-improving.

Pigovian welfare economics states conditions for partial welfare maximisation in one market regardless of what may be happening in other markets. This puts the focus on the failure of the price mechanism to fully reflect the costs of producing information (inventions, artistic creations and so on). In a perfectly functioning market, the marginal cost of producing units of goods and services by entrepreneurs (which is also equal to the average cost under constant returns to scale) is exactly recompensed by the market price, thus providing suppliers with their reward (normal profit) and the incentive to stay in business. When this equation of marginal cost and price does not occur, the market does not coordinate incentives to producers to supply socially optimal quantities of goods and incentives to consumers to ration their use. Where there are external costs and benefits from private production and consumption, prices cannot signal incentives to produce and consume the optimal amounts and there is under- or over-production and consumption. This is the principal source of market failure.

30. Posner, R. (1992), *Economic Analysis of the Law*, 4th edition, Boston, MA: Little Brown and Company.

In Pigovian welfare economics the conditions for achieving maximum social welfare in a market are that marginal *social* (private and external) cost should equal marginal *social* benefit and, as this equilibrium cannot be achieved through private incentives, there is a case for government intervention to alter private incentives so as to achieve equilibrium: a subsidy (in the case of unpriced benefits) or a tax (in the case of unpriced costs) or a regulatory intervention, such as IP law. In extreme cases, markets do not develop at all and these are so-called `missing markets'; such situations could occur because the transaction costs of organising a market are too high to make it worthwhile, for example, when there are a large number of small-scale users (Gordon[31]). In all these cases, the government or other institution (copyright collecting societies are examples) may organise the collection of payment to simulate a market.

The Property Rights Approach

The property rights approach owes its origin to Coase's objection to Pigovian welfare economics. In Coase's view, Pigou did not establish the case for government intervention, as the `problem of social cost' could be solved by private negotiation of compensation payments. Coase argued that as long as property rights are well defined, voluntary exchange in markets will lead to the optimal assignment of compensation to the transactor who values them most highly. Ensuring freedom to bargain and trade property rights is all the government need do. According to the so-called `Coase theorem', the initial distribution of property rights does not matter provided they are freely tradable, transaction costs are low and there are no wealth effects. In the case of IPs, transaction costs can be high, especially when there are many rights-holders (Gordon and Bone[32]), in which case the Coase Theorem does not apply.

Under the property rights paradigm, private property is justified by economic efficiency as long as the net gains from internalising costs and benefits are positive. Competition for the ownership of property rights causes use to be rationed via the price mechanism, which also provides incentives to improve productivity. In the case of IPs, privatisation is achieved by means of `artificially' created property rights - patents, copyrights, trademarks, design rights, and so on. Privatisation requires excludability, however, which introduces costs of `fencing' and other exclusion devices (such as jamming broadcasts or cutting of supplies) and this leads to transaction costs of defending rights.

The property rights approach puts the discussion of IPs in the context of the institutional framework of property law and the economic analysis of private ownership (Merges[33]). It also emphasises the `bundled' quality of IP rights: patents and copyrights embody many rights, which are not necessarily efficiently traded as a lump. De-bundling of rights may improve efficiency, depending on transaction costs. An example is the separate sale of publication, film, video and broadcast rights of a book (Besen, Manning and Mitchell[34]; see Caves (2000)[35] for a comprehensive treatment of contracting in the creative industries). However, the more rights proliferate, the more parties there are to the bargains that are necessary to gather works together to get a good or service to market; this increases potential hold-up problems and so increases transaction costs (Towse[36]).[37] This is a particularly complex process in the international trade of IP-based products where the

31. Gordon, W.J. (1982), `Fair Use as Market Failure: A Structural and Economic Analysis of the *Betamax* Case and its Predecessors', *Columbia Law Review*, **82** (8), December, 1600-657.
32. Gordon, W.J. and Bone, R.G. (2000), op. cit. supra note 3.
33. Merges, R.P. (1994), `Of Property Rules, Coase, and Intellectual Property', *Columbia Law Review*, **94**, 2655-73.
34. Besen, S.M., Manning, Jr. W.G. and Mitchell, B.M. (1978), `Copyright Liability for Cable Television: Compulsory Licensing and the Coase Theorem', *Journal of Law and Economics*, **XXI** (1), April, 67-95.
35. Caves, R. (2000), *Creative Industries: Contracts Between Arts and Commerce*, Cambridge, MA: Harvard University Press.
36. Towse, R. (1999), `Copyright and Economic Incentives: An Application to Performers' Rights in the Music Industry', *Kyklos*, **52** (3), 369-89.

national laws of many countries are involved.

The property rights approach is an important paradigm in law and economics and is particularly associated with the Chicago School. It seems to us to be capable of further adaptation for the analysis of IPs in information markets, particularly in relation to industrial organisation of new media and the role of firms as IP rights negotiations. We reprint MacKaay[38], Palmer[39] and Merges[40] to give a flavour of the debate about the property rights and efficiency approaches to the interpretation of IP law.

The Dynamic Paradigm

The welfare economics model has been criticised for its preoccupation with the properties of equilibrium and for its static framework. The process of competition, emphasised by Schumpeter and now championed by the neo-Austrian School, is better suited to a dynamic analysis of an economy that is developing and growing through innovation and technical change - the very items that give rise to the case for patents and copyrights and other IPs. Schumpeter saw competition as a process of `creative destruction' in which deadwood in the economy is cut out by dynamic firms raising overall productivity by innovation, thus reducing prices and driving out more costly firms. In this process, leaner fitter firms succeed less able ones, new technologies and products replace old ones. These firms may well be monopolies because, according to the so-called `Schumpeterian hypothesis', monopolies are more likely to undertake R&D expenditures and adopt innovations than firms in competitive markets. Modern Austrian economists see entrepreneurship as a groping by firms for economic opportunities; some win, some lose but there is no final end-state of optimality because the process of competition and survival is never-ending.

The difference between the static and dynamic paradigms is well illustrated by means of the simplistic (static) welfare analysis of the `social cost' of monopoly as a deadweight loss to the economy that appears in every elementary economics textbook, using the misleading comparison of perfect competition and monopoly in one diagram.

Diagram 1 illustrates two supposedly comparable scenarios, *A* and *B*, in which a market that was previously competitive is taken over by a single firm monopolist. *D* represents market demand, either shared between competing firms or the monopolist. In scenario *B*, perfectly competing profit-maximising `representative' firms set a price equal to marginal cost (*MC*) to determine the market output at Q_B and the equilibrium price P_B; for long run equilibrium of the firm, there must be constant returns to scale and no supernormal profits and so *AC* (average cost) is equal to *MC*. In scenario *A*, the profit-maximising monopolist equates *MC* to marginal revenue (*MR*); the monopoly price is therefore P_A and quantity bought and sold Q_A; price is higher and output lower under monopoly as compared to competition with the area *ABC* being the deadweight loss of welfare, the social cost of monopoly.[41] This analysis of the deadweight loss underlies quite a lot of the law and economics literature on IP.

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37. This may ultimately become the `Tragedy of the Anti-Commons': Heller, M. (1998), `The Tragedy of the Anti-Commons: Property in the Transition from Marx to Markets', *Harvard Law Review*, **111** (3), 621-88.
38. Mackaay, E. (1990), op. cit. supra note 26.
39. Palmer, T.G. (1989), op. cit. supra note 25.
40. Merges, R.P. (1994), op. cit. supra note 33.
41. This deadweight loss may also be viewed as the amount the firm would be prepared to spend in rent-seeking activities, for example, lobbying for a government licence or for increased IP protection.

Diagram 1: Deadweight loss of monopoly

The comparison is fallacious, however, because it supposes that costs would be the same for an innovating monopoly as for a firm producing a homogeneous product in a competitive market; moreover, there is clearly no reason why a dynamic new entrant or a large, wellestablished firm - the kind Schumpeter envisaged as undertaking innovations and R&D - would produce at the point of constant returns to scale.

The above analysis relates to the supply side of the market. Dynamic network external effects, by contrast, are a feature of the demand side. They are external benefits to a consumer from the size of the network concerned (the `classic' example is fax machines or e-mail - the more people you can contact that way, the more valuable the facility is to you). Network effects, like other externalities, are something an individual cannot appropriate or, more controversially, pay for. Gordon and Bone[42] use network economies as an argument for copyright, particularly in the computer industry, while Takeyama[43] uses them to demonstrate the welfare gain of piracy; Liebowitz[44], however, denies that there are external benefits of any kind, as he believes the market is able to internalise them via price. The dynamic paradigm offers a stronger justification for IP protection than the static one and suggests, moreover, that historical institutional analysis of IPs and development is called for (MacKaay[45]; David[46]).

These brief sketches of the different approaches to the economic analysis of IPs demonstrate that there is no one view within economics as to the rationale for IP law or consensus on its effect on markets for information goods. The general points discussed so far are now developed in more detail relating to the groups of articles reprinted in this and subsequent volumes.

III. Economic Analysis of Individual IPs

Economics of Copyright

Copyright law was first enacted in England in 1709 with the Statute of Anne and was gradually adopted in

42. Gordon, W.J. and Bone, R.G. (2000), op. cit. supra note 3.
43. Takeyama, L.N. (1994), `The Welfare Implications of Unauthorized Reproduction of Intellectual Property in the Presence of Demand Network Externalities', *Journal of Industrial Economics*, **XLII** (2), June, 155-66.
44. Liebowitz, S.J. (1985), `Copying and Indirect Appropriability: Photocopying of Journals', *Journal of Political Economy*, **93** (5), October, 945-57.
45. Mackaay, E. (1990), op. cit. supra note 26.
46. David, P.A. (1993), op. cit. supra note 18.

other countries. In the US, the principle was embodied in the Constitution in 1776 and the first Federal Copyright Act was passed in 1790. It gives authors the right to exclude others from copying their work without permission, the so-called exclusive right of authorisation. The basic right conferred on the author is that of controlling or restricting the acts of copying, that is, reproducing the work, issuing copies to the public, performing the work in public, broadcasting it by wire or satellite and including the work in a cable programme, playing and showing the work in public and renting or lending it to the public. Copyright applies to a wide range of literary, dramatic, musical and artistic works in various media, such as broadcasts, films, recordings, computer software and the like; it does not require any proven artistic or innovative merit, and accepts authorship on the basis of creative effort (originality); thus arrangements, compilations, listings, databases, etc. are protected by copyright separately from the original material embodied in them. The author may license, assign or sell these rights outright or in part, or transfer them to an agent; only the author's moral right in the work may not be sold or transferred. As techniques for reproducing and copying creative work have developed and the hardware for applying them has become cheaper, making it possible for the average household to own several copying devices (aural and video tape recorders, photocopiers, computers), the scope and degree of protection of copyright law has increased. In addition, changes in social attitudes to creativity and to the status of artists have led to different forms of protection under copyright law, such as *droit de suite* for visual artists and performers' rights. Typically, copyright for sales and other primary use is administered by the publisher; secondary use, such as photocopying and public performance of recorded works, is licensed by co-operative collecting societies (Liebowitz[47], MacQueen and Peacock[48], Towse[49]; also Besen and Kirkby[50], Taylor and Towse[51]).

Copyright in what is now called the Anglo-Saxon tradition, is essentially conceived of as an economic right that enables trade to take place in information goods. From the start, it applied to publishers as well as to authors. In Continental European countries, influenced by the Kantian concept of the author, copyright is an author's right (*droit d'auteur*) attached to the personality of the author; it embodies *droit morale*, what are now called moral rights, the right to attribution, integrity, disclosure and withdrawal, and they are inalienable. The underlying rationale for this concept of copyright is natural justice rather than `economic'. With the globalisation of the cultural industries and increasing standardisation of copyright worldwide, however, the distinction between the civil law countries' emphasis on moral rights and copyright in the common law tradition is eroding. Moral rights have been incorporated into Anglo-Saxon law and European countries have extended copyright to neighbouring rights (rights neighbouring on copyright) to performers and to firms producing information goods. Hansmann and Santilli[52] consider both equity and efficiency arguments for artists' moral rights, which are now incorporated in US law, while Rushton[53] argues that there is anyway pecuniary benefit from moral rights, so *droit moral* must be regarded as having efficiency effects; the moral right has an incentive effect for artistic production because it encourages artistic recognition of status and professionalism. Solow[54], however, makes a pure efficiency case for *droit de suite*.

47. Liebowitz, S.J. (1985), op. cit. supra note 44.
48. MacQueen, H.L. and Peacock, A. (1995), op. cit. supra note 11.
49. Towse, R. (1999), op. cit. supra note 36.
50. Besen, S.M. and Kirkby, S. (1989), `Private Copying, Appropriability and Optimal Copying Royalties', *Journal of Law and Economics*, **32**, 255-80.
51. Taylor, M. and Towse, R. (1998), `The Value of Performers' Rights: an Economic Approach', *Media, Culture and Society*, **20** (4), 631-52.
52. Hansmann, H. and Santilli, M. (1997), `Authors' and Artists' Moral Rights: A Comparative Legal and Economic Analysis', *Journal of Legal Studies*, **XXVI** (1), January, 95-143.
53. Rushton, M. (1998), `The Moral Rights of Artists: Droit Moral or Droit Pécunaire?', *Journal of Cultural Economics*, **22** (1), 1-13.
54. Solow, J.L. (1998), `An Economic Analysis of the *Droit de Suite*', *Journal of Cultural Economics*, **22** (4), 209-26.

Landes and Posner[55] have made the distinction between the economics of copying and the economics of copyright, that is, economic analysis of the doctrines of copyright law. According to this distinction, Plant[56], Hurt and Schuchman[57], Breyer[58], Novos and Waldman[59], Johnson[60] are concerned with the economics of copying. Plant, Hurt and Schuchman and Breyer questioned the case for having copyright at all; the focus of their argument was the dynamic incentive copyright provides in stimulating *author's* supply. Novos and Waldman, as well as Johnson, adopted a general welfare approach, using a comparative static model to consider the theoretical effect on *markets* of changes to copyright law. The main feature of the economics of copying is that it throws the emphasis on to the relation between the fixed costs of expression and the marginal cost of making copies (O'Hare[61]). Landes and Posner themselves, Gordon[62] and Hardy[63] adopt a law and economics approach analysing the economic rationale for the doctrines of copyright law (such as its scope and duration, derivative works, fair use and works for hire doctrine).

Landes and Posner's[64] economic analysis of copyright hinges on its positive and negative incentives to creativity: the author's exclusive right removes works from the public domain for the duration of the copyright, thereby increasing the cost to subsequent authors of creating new works. For this reason ideas cannot be copyrighted; if, for example, someone were able to copyright musical notation, she could effectively monopolise musical composition until a new notation were developed and disseminated or the copyright expired. Therefore, in order to maximise creative output, the law must strike a balance between the protection of the author and the costs that imposes on other authors, such as search costs for novel means of expression and of obtaining permission to use the copyrighted works of others; that balance is to be found when the cost of extra protection by copyright, which inhibits creativity by restricting access to the public domain, equals the incentive it provides to authors.

Landes and Posner's model yields specific policy implications: a greater (optimal) copyright protection is required for works that have greater social value; this implies that copyright should be discriminatory and not applied across the board (Plant[65] also reached this conclusion). However, a discriminatory regime is too costly to administer and therefore copyright is uniform. Since the (private) value of works increases with demand and markets expand with technical change, copyright protection should expand over time. The optimal level of copyright protection must take account of the higher transaction costs that it causes; the costs of tracing copyright owners increase with the duration of copyright, providing a brake on the number of years *post mortem autoris* that are desirable. The reason as to why there should not be perpetual copyrights as in land rights, is that land is overused if not privately owned, whereas IP is non-rival and cannot be overused. The lower the costs of administering copyright and the more authors respond to it, the greater will be the optimal extent of protection.

55. Landes, W.M. and Posner, R.A. (1989), op. cit. supra note 7.
56. Plant, A. (1934), op. cit. supra note 19.
57. Hurt, R. and Schuchman, R. (1966), `The Economic Rationale of Copyright', *American Economic Review*, **56**, 421-32.
58. Breyer, S. (1970), `The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs', *Harvard Law Review*, **84** (2), December, 281-351.
59. Novos, I.E. and Waldman, M. (1984), `The Effects of Increased Copyright Protection: An Analytic Approach', *Journal of Political Economy*, **92** (2), April, 236-46.
60. Johnson, W.R. (1985), `The Economics of Copying', *Journal of Political Economy*, **93** (1), February, 158-74.
61. O'Hare, M. (1985), `Copyright: When is Monopoly Efficient?', *Journal of Policy Analysis and Management*, **4**, 407-18.
62. Gordon, W.J. (1982), op. cit. supra note 31.
63. Hardy, I.T. (1988), `An Economic Understanding of Copyright Law's Work-Made-for-Hire Doctrine', *Columbia-VLA Journal of Law and the Arts*, **12** (2), 181-227.
64. Landes, W.M. and Posner, R.A. (1989), op. cit. supra note 7.
65. Plant, A. (1934), op. cit. supra note 19.

Fair use[66] doctrine is also analysed with respect to its balance of social costs and benefits. The public interest in maximising creative output justifies both the incentive to create that copyright provides and its modification to ensure users' access to the works that are created. The exclusive right of authorisation is therefore limited in copyright statutes and exceptions made for certain types of `fair use' - the use of copyrighted material without the author's consent and without payment. The underlying economic issue according to (Gordon[67]) is market failure, due to transaction costs exceeding the value of copies to individual users: fair use is a defence against copyright infringement when there is market failure, when transferring control to the `infringer' is in the public interest and when the incentives to the copyright owner are not substantially altered. Here market failure is used in the literal sense that a market fails to develop. The role of copyright law is then a Posnerian one of `creating a market' by legal intervention, for example, by creating or regulating copyright collection agencies, such as the US Copyright Clearance Center for photocopying. A too strong copyright regime that tolerated little fair use would raise transaction costs and copyright-based earnings, transferring rents to artists from users; it would, however, raise the costs of creation to later authors, as argued by Landes and Posner. A too weak regime, on the other hand, would not provide sufficient incentives to look for means of charging and therefore would reduce transaction costs and earnings but it would also ease what Landes and Posner called `productive' (as compared to `reproductive') fair use of copyright material for creating new and derivative works and benefit consumers. Copyright law must therefore balance these opposite tendencies.

Another approach of economists writing on copyright, is to consider the implementation of copyright. There has been some theoretical work, for example, by Besen, Kirkby and Salop[68] on the economics of copyright collectives; another aspect of the literature is empirical work by Peacock and Weir[69], Peacock[70], MacQueen and Peacock[71], Towse[72] and Taylor and Towse[73] that investigates the complex institutional arrangements for the administration of copyright, mainly in the music industry, where collection societies have been established longest. Finally, we direct readers to an important new literature on the economic effects of digitalisation, which provides a new spin on the old question of how copyright for information goods may be implemented under changing technology; Bell[74] is an accessible source.

Economics of Patents

Two noneconomic and two economic justifications in favour of a patent law can be given. First, the creation of a patent system is connected with the idea that an invention is intellectually owned by the inventor, who therefore has a natural right to protection (Prager[75] speaks of `the ancient and eternal idea of intellectual

66. The doctrine is known as fair dealing in the UK; in the US and the UK exceptions and limitations are judged in the context of the case. In other countries they are specified by statute (see, for example, The Netherlands, Holzhauer, R.W. (1999), `*Fair Use in Law and Economics*', paper presented at the European Association for Law and Economics conference, mimeo, Erasmus University Rotterdam.
67. Gordon, W.J. (1982), op. cit. supra note 31.
68. Besen, S.M., Kirkby, S. and Salop, S. (1992), `An Economic Analysis of Copyright Collectives', *Virginia Law Review*, **78**, 383-441.
69. Peacock, A. and Weir, R. (1975), *The Composer in the Marketplace*, London: Faber.
70. Peacock, A. (1979), `Public Policy and Copyright in Music: An Economic Analysis', Chapter 10 in: *The Economic Analysis of Government*, Oxford: Martin Robertson.
71. MacQueen, H.L. and Peacock, A. (1995), op. cit. supra note 11.
72. Towse, R. (1999), op. cit. supra note 36.
73. Taylor, M. and Towse, R. (1998), op. cit. supra note 51.
74. Bell, T. (1998), `Fair Use vs. Fared Use: The Impact of Automated Rights Management on Copyright's Fair Use Doctrine', *North Carolina Law Review*, **761**, 558-619.
75. Prager, F.D. (1952), `The Early Growth and Influence of Intellectual Property', *Journal of the Patent Office Society*, 106-40.

property'). Secondly, that those who think of creative solutions to problems deserve a reward. Third, the patent system can be seen as a public contract with the inventor for the disclosure of his secrets. Finally, the patent system can be seen as an instrument to stop free-riding. It can accelerate technological progress through the stimulus it provides for the financing of industrial research and development of new industrial ventures (Kitch[76]). Economic arguments have become paramount as justification. Some researchers consider the providing of incentives as the main function of patent law (Bowman[77]), others as its sole function. Among the second group is Machlup[78], who is convinced that people patent only what they cannot hope to keep secret.

Patent Scope and Duration

While there is an abundant literature on the innovative process and issues such as the optimal term of protection have been discussed quite thoroughly, there is little literature on the optimal scope of a patent. Merges and Nelson[79] regret this. One reason might be that duration is a more concrete and statutory element, whereas scope (or breadth) is determined by the courts (and is less clear to define). All literature refers to US patent law. Gilbert and Shapiro[80] and Klemperer[81] discuss optimal patent scope in terms of static welfare economics. Their analysis proceeds as follows: they assume that there are consumer goods of different qualities and that each of these goods can be pictured as a point on a continuum; therefore, the concept of `distance' between two goods makes sense. A patent can be issued for a point or an interval on this continuum; the patent scope is then modelled as the span of this interval. The authors then argue as follows: the welfare losses caused by the length of time the patent exists is the deadweight loss caused by the patent monopoly. In Klemperer's model the welfare loss caused by the scope of the patent is the sum of the welfare losses on the individual markets; Gilbert and Shapiro also take into account the possibility that the patent-holder may not produce all the products that are protected by his patent, which would result in an additional welfare loss. One can now derive a trade-off between the losses due to the patent scope and expiration date on the one hand and the gain from the development of the invention on the other to arrive at a formula for the optimal patent scope.

Dam[82], Merges and Nelson[83] as well as Besen and Raskind[84] question the effect of patenting on technological development. The argument is that there are inventions that are basic in the sense that in the future there may be a lot of technological devices which would not be used without them. If the inventor of a basic invention can appropriate not only the gain from his own invention but also the gains from all the other dependent inventions, no-one but the original inventor would have the incentive to develop them. Merges and Nelson argue from case studies that such a research monopoly tends to slow down technological development.

76. Kitch, E.W. (1998), op. cit. supra note 4.
77. Bowman, W. (1973), *Patent and Anti Trust Law: A Legal and Economic Appraisal*, Chicago, IL: University of Chicago Press.
78. Machlup, F. (1958), op. cit. supra note 17.
79. Merges, R.P. and Nelson, R.R. (1990), `On the Complex Economics of Patent Scope', *Columbia Law Review*, **90** (1), January, 839-916.
80. Gilbert, R. and Shapiro, C. (1990), `Optimal Patent Length and Breadth', *RAND Journal of Economics*, **21** (1), Spring, 106-12.
81. Klemperer, P. (1990), `How Broad Should the Scope of Patent Protection Be?', *RAND Journal of Economics*, **21** (1), Spring, 113-30.
82. Dam, K.W. (1994), op. cit. supra note 9.
83. Merges, R.P. and Nelson, R.R. (1990), op. cit. supra note 79.
84. Besen, S.M. and Raskind, L.J. (1991), `An Introduction to the Law and Economics of Intellectual Property', *Journal of Economic Perspectives*, **5**, 3-27.

Empirical Evidence on Patents

An evaluation of the patent system should balance the benefits from additional innovations against both the losses from limiting access and the costs of administering patent protection. This is the same argument as that put forward with respect to copyright (Landes and Posner[85]). The benefits and most of the costs cannot be measured directly. With respect to the benefits we do not know which products or processes are due to the patent system. As an indirect measure, however, we can approximate the effects by comparing countries with and without a patent system, by quantitative analysis or industrial surveys (Taylor and Silberston[86]). The results of empirical research cast serious doubt on the functionality of the patent system. According to Levin[87], patents are at most an imperfect guarantee of appropriability. Many patents can be `invented around', while others provide little protection because they would fail to survive a legal challenge to their validity. Still others are unenforceable because it is difficult to prove infringement. In a study of 650 R&D executives in 130 different industries, Levin found that patents were viewed as an effective instrument for protecting the competitive advantages of new technology only in chemical industries, including pharmaceuticals, but in most other industries patents werejudged to be relatively ineffective. Mansfield[88] obtained similar results from a survey of manufacturing industries: patent protection was judged to be essential only in pharmaceuticals and chemicals. In all the other industries surveyed, patent protection was not only not considered essential for the development and introduction of less than 10 per cent of their innovations, in several industries respondents were unanimous in reporting that patent protection was not essential at all.

Although patents play a minor role, the proposition that patents are unnecessary is difficult to maintain. The need for patents varies with the market position of the would-be innovator. Scherer[89] found that for established firms, the spur of competition from technically vigorous rivals is likely to provide sufficient incentive for innovation in all but exceptional cases. However, small firms, and especially small new firms, are apt to find the prospect of some patent protection essential before undertaking sizeable innovative ventures. The need for patents also depends on the interrelation of costs, risks and potential payoffs. All other things being equal, patent protection provides a more essential incremental incentive, the smaller the market is in relation to development costs and the greater are the technological and marketing uncertainties associated with innovation.

On the cost side, it is estimated that patents create a small barrier to entry by raising the costs of imitation on average by 7 to 10 per cent (Levin *et al*.[90]). Mansfield, Schwartz and Wagner[91] found in their study of innovations and imitations in four major industries that imitators can bring out a competing product in about two-thirds of the time and at about two-thirds of the cost of the original innovator. About 70 per cent of the innovations in this study were patented. Sixty per cent of the patented innovations in this study had been imitated within four years of their introduction, although patenting appeared to increase the cost of imitation by

85. Landes, W.M. and Posner, R.A. (1989), op. cit. supra note 7.
86. Taylor, C.T. and Silberston, Z.A. (1973), *The Economic Impact of the Patent System*, Cambridge: Cambridge University Press.
87. Levin, R.C. (1986), `A New Look at the Patent System', *American Economic Review*, **76** (2), May, 199-202.
88. Mansfield, E. (1986), `Patents and Innovation: An Empirical Study', *Management Science*, **32** (2), February, 173-81.
89. Scherer, F.M. (1977), *The Economic Effects of Compulsory Patent Licensing*, New York: Graduate School of Business Administration, Center for the Study of Financial Institutions, New York University, 5-90.
90. Levin, R.C., Klevorick, A.K., Nelson, R.R. and Winter, S.G. (1987), `Appropriating the Returns from Industrial Research and Development', *Brookings Papers on Economic Activity*, **3**, 783-820.
91. Mansfield, E., Schwartz, M. and Wagner, S. (1981), `Imitation Costs and Patents: An Empirical Study', *Economic Journal*, **91** (304), December, 907-18.

about 11 per cent. Their conclusion was that patents tended to increase imitation costs, particularly in the drug industry, but excluding drugs, patent protection did not seem essential for the development and introduction of at least three-fourths of the patented innovations studied. This may account for the fact that most patents expire before the full patent term is reached.

Although the patent system in practice does not guarantee exclusive property rights during the full patent term, this does not mean that firms patent only a small percentage of their patentable inventions. According to Mansfield[92], they seem to patent about 50 to 80 per cent of their patentable inventions. Patent executives hold the opinion that the prospective benefits from patent protection frequently exceed its costs. These benefits may consist of the delay caused to imitators and the use of patents as bargaining chips or the possibility of measuring the performance of R&D employees, of gaining strategic advantage in interfirm negotiations or litigation, or of obtaining access to foreign markets where licensing to a host-country firm is a condition of entry (Levin[93]). Usually established firms are only willing to negotiate with inventors if they are backed with a patent(-application) (Cheung[94]).

We can be brief with respect to the problem of patents and monopoly (Dam[95]). If one accepts the fact that patents offer the patent holder only limited protection, one has at the same time to accept that the costs of limited access are relative small. With respect to social costs there may well be a paradox: because of imperfect patent protection welfare losses are tolerable and the lengthy term of protection causes few problems. The costs of administering the patent system are borne by the applicants themselves. Disregarding litigation costs, the administration costs are considered to be relatively low.

Several causes of uncertainty for third parties no doubt lead to transaction costs. To name just four: there are different practices of different patent offices; diverging judicial interpretations of patent claims; registration patents (where there are `loose claims' about) and there are lobbying processes by interested parties (although Dam argues that `not all rent is waste'). The influence of these uncertainties is still very much in need of research. On the other hand there are also transaction benefits: there is certainly more to patent policies than a single patent! We can make mention of multiple patent portfolios; (cross)licensing and shared technology (Ordover[96]); licensing fee arrangements and of some game theoretical literature, studying repeat invention games. Despite all this, it remains the case that economics has not contributed much to patent policies.

The above accounts for the mixed overall judgment of the patent system. Machlup's famous conclusion still appears to hold: `if we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it.' (Machlup[97]; see also Dam[98]).

Trade Secrets

Not all (technical) information can be patented; sometimes patenting is too expensive and some information is more valuable if kept secret. This is the major economic rationale for having a trade secret law apart from a

92. Mansfield, E. (1986), op. cit. supra note 88.
93. Levin, R.C. (1986), op. cit. supra note 87.
94. Cheung, S.N.S. (1982), `Property Rights in Trade Secrets', *Economic Inquiry*, **XX** (1), January, 40-53.
95. Dam, K.W. (1994), op. cit. supra note 9.
96. Ordover, J.A. (1991), `A Patent System for Both Diffusion and Exclusion', *Journal of Economic Perspectives*, **5**, 43-60.
97. Machlup, F. (1958), op. cit. supra note 17.
98. Dam, K.W. (1994), op. cit. supra note 9.

patent law (Friedman[99]). Another reason is that trade secrets can entail significant costs to maintain secrecy and negotiate, specify, and monitor contractual relationships (Cheung[100]), (Kitch[101]) addresses the optimal level of expenditure to maintain secrecy (and argues that all such `fencing costs' are inefficient). Friedman, Landes and Posner[102] also discuss this optimal level of precaution against disclosure. The appropriability of non-patented or nonpatentable information thus provides incentives to produce this type of valuable information.

Trademarks

The economic analysis of trademarks differs somewhat from that of copyright and of patents because trademarks have a different function in the market. The trademark performs an important function of providing information to consumers by reducing search costs and uncertainty about product quality, especially for goods that can only be evaluated by testing their characteristics through purchase. Without trademarks, consumers would be confronted with an impossible hurdle of finding which product they want (Economides[103]). In the theory of monopolistic competition, the individual producer marks his product in order to give the consumers the ability to differentiate his product from the substitute products of rivals on the market. This basic necessity to distinguish and to claim exclusivity is discussed by Papandreou[104], Economides[105] and Landes and Posner[106]. On the one hand, it gives the producer a certain monopoly power because of product differentiation, for which consumers are willing to pay a certain price premium; on the other hand, it saves consumers search costs and it enables them to buy a product which better satisfies their needs. Landes and Posner[107] add these search costs to the money price of products and thus speak of a `full price'.

Thus, there is a trade-off between higher prices due to the monopolistic elements of the trademark and the greater transparency of the market. The market as a monopolistic competitive model, functions better as a meeting place between the wants of consumers and the output of producers. The consumer is able to learn from his buying experiences and the producer has the incentive to keep up the desired quality standard and variety. If producers were free to imitate the trademarks of others, no-one would have any incentive to maintain the quality of his goods, for they would inevitably be imitated by inferior products made to look identical and sold at lower prices. It is evident at once that in fields where differentiation is possible, the consumer needs legal protection against inferior quality. The law of trademarks and unfair trading safeguard consumers by putting a premium on differentiation and protecting the monopolies thereby established. The economic functions of trademarks are paramount; for possible other rationales see Carter[108].

On the basis of the above analysis, it is clear that the first function of the trademark in the market is to protect the consumer and the producer against those competitors who confusingly pass off their goods as if

99. Friedman, D.D. (1998), op. cit. supra note 5.
100. Cheung, S.N.S. (1982), op. cit. supra note 94.
101. Kitch, E.W. (1980), `The Law and Economics of Rights in Valuable Information', *Journal of Legal Studies*, **IX**, 683-723.
102. Friedman, D.D., Landes, W.M. and Posner, R.A. (1991), `Some Economics of Trade Secret Law', *Journal of Economic Perspectives*, **5** (1), Winter, 61-72.
103. Economides, N.S. (1988), `The Economics of Trademarks', *Trademark Reporter*, **78** (4), July-August, 523-39.
104. Papandreou, A.G. (1956), `The Economic Effect of Trademarks', *California Law Review*, **XLIV**, 503-10.
105. Economides, N.S. (1988), op. cit. supra note 103.
106. Landes, W.M. and Posner, R.A. (1988), `The Economics of Trademark Law', *Trademark Reporter*, **78** (3), May-June, 267-306.
107. Landes, W.M. and Posner, R.A. (1988), op. cit. supra note 106.
108. Carter, S.L. (1989), `The Trouble with Trademark', *Yale Law Journal*, **99** (1), October, 759-800.

they were the original producer's by imitating his trademark. This distinctive function of the trademark as a sign of origin forms, with the addition of advertising, the cornerstone of the market process in relation to differentiated products. This function as a sign of origin, however, does not mean that the potential buyers have to know the source from which the product comes. The trademark, as opposed to tradenames, does not aim to distinguish the producer but to characterize the product as coming from one source. The importance for the consumer is not to know the source of production, but to know that the producer of the later trademarked product is the same as the one who produced the earlier one bought by the consumer. This function, the so-called identification function, is from a competitive standpoint the essence of the origin function. When the consumer is able to identify the products in a differentiated market, three things happen. First, the consumer is in a better position to judge the different qualities of the products because he can tell them apart. He can translate his positive or negative opinion about a marked product into a second purchase decision or a refusal to buy. Second, the producer will do everything in her power to retain consumer loyalty by keeping up the quality standards she has until then given her product. Third, competitors are in a better position to try to undermine the monopoly power of the producer by drawing consumer attention to their substitute products by underselling the trademarked product. Trademarks therefore keep the communication lines between producers and consumers open; they improve the transparency of the market by transferring information about the qualities and the prices of the products; they keep the barriers to entry lower than they otherwise would be, because they improve price and quality competition. When the trademark is seen as a form of communication between sellers and buyers it will be clear that this process is not limited in time. This is a first argument for an unlimited term of protection. Other arguments can be offered from a transaction costs perspective and from the low threat of rent seeking (Landes and Posner[109]).

An important element in the economics of IP rights is always the scope of protection. In trademarks the discussion is both on the criterion and on the number of consumers to whom the criterion should apply. The starting point is the criterion of confusion. Landes and Posner, Carter[110] and Holzhauer[111] discuss at length the criteria of confusion (real or likely) and dilution (or association), showing rationales for both. Carter and Holzhauer in particular, point out the risks of treating trademarks as `property'. Other issues are the acquisition of trademarks (registration, first possession or a combination), the transfer (sale/licensing/ `trafficking') of trademarks and the core criterion of distinctiveness. All discussions mentioned typically hinge on the functions of trademarks that the analyst takes into account.

There is some doubt in the economic literature whether the process of the creation of the selling power of a brand should be translated into an exclusive right for the trademark owner, or should be left to the pressure of the competitive forces of the marketplace. On balance, the welfare losses from trademarks are low and the economic rationale for having trademarks (as opposed to having copyright or patents) is not questioned (Economides[112], Landes and Posner[113]).

Competition Issues and Parallel Imports

The existence and use of (exclusive) IP rights have a considerable impact on the competitive process in a market economy. From a competition policy perspective it is necessary to identify and balance the possible pro- and anti-competitive effects (Gallini and Trebiicock[114]). The first question is whether an exclusive right in

109. Landes, W.M. and Posner, R.A. (1988), op. cit. supra note 106.
110. Carter, S.L. (1989), op. cit. supra note 108.
111. Holzhauer, R.W. (1998), `Jenever and Jumping Wild Cats: The Scope of Trade Mark Protection in Economics and in Law', in G. von Wangenheim (ed.), *Discussionpapers on Law and Economics*, Volume 1, Hamburg: Erasmus Programme in Law and Economics, 50-66.
112. Economides, N.S. (1988), op. cit. supra note 103.
113. Landes, W.M. and Posner, R.A. (1988), op. cit. supra note 106.
114. Gallini, N.T. and Trebilcock, M.J. (1998), `Intellectual Property Rights and Competition Policy: A

IP necessarily creates market power. The ability to exercise market power stems from the nature of demand for the property, which in turn depends on the availability of substitutes, the cross-elasticity of demand between these possible substitutes as well as on the cross-elasticity of demand between the protected property and complementary goods. Furthermore, one has to consider that products or processes, either legally protected or not, generally have to compete with a variety of substitutes. The second, more or less related question, is whether an owner of an IP right can use a given amount of market power to gain additional market power in either the same or other markets. A number of commentators have found this so-called `leverage hypothesis' unconvincing, while others are of a different opinion. This difference of opinion largely coincides with the dividing line between Chicago and Harvard adherents.

Owners of IP rights may use licensing to accomplish a variety of goals which are not necessarily anti-competitive and even may be pro-competitive. Several of the restrictive terms incorporated in licensing agreements may correspond to efforts that increase the profitability of the exploitation of IP rights. The point of departure in the following analysis includes several assumptions which may not be applicable to all countries. It is assumed that competition policy is concerned with the preservation of competition as a process and seeks to maximise consumer welfare. Both assumptions might lead to confrontations with national competition policies that stress other factors.

Pro-competitive effects of licensing can be grouped into four broad categories (Jacquemin[115], Gutterman[116], Baxter and Kessler[117]). The first one is related to firms' profit maximising behaviour: through perfect price discrimination, the IP holder could capture the full consumer surplus with the result that output would be the same as in a perfectly competitive industry. However, when the licensor cannot perfectly discriminate among consumers the outcome is less clear (and it should also be pointed out that this way of thinking implies (costless) perfect information). Furthermore, for the licensor to be able to practice effective price discrimination it is necessary to be able to block arbitrage, for example, by parallel importers. This may require territorial or so-called `field-of-use' restrictions. The second pro-competitive category is related to the avoidance of free-rider problems in combination with demand enhancement, especially relevant for the selling of complex items. An IP rights owner may use restrictions to increase the incentives for a licensee to develop promotion and pre-sales and after-sales services. Free-riding, for example, by parallel importers, could reduce a licensee's incentives to perform as desired. In this particular circumstance, a balance must be found between the pro-competitive and anti-competitive effects. A third group of pro-competitive restrictions are used to reduce the level of risk and transaction costs facing the licensor and his potential licensees. These risks may stem from uncertainty, for example, about the utility of and the demand for the IP and the abilities of the licensee. Reduction of these risks and/or transactions costs through tie-ins, royalty reward systems and agreements may result in an increase of the expected returns and an increased diffusion of the licensed IP asset. Fourth, restrictions in licensing agreements may be used to maintain a reputation for quality, a point essentially similar to that covered under the second category. In short, nearly all of the pro-competitive effects are found when the relationship between licensor and licensee is essentially vertical. If such circumstances prevail, it may be necessary to accept certain restrictions on intra-brand competition, in

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Framework for the Analysis of Economic and Legal Issues', in: R.D. Anderson and N.T. Gallini (eds), *Competition Policy and Intellectual Property Rights in the Knowledge-Based Economy*, Chapter 2, Calgary: University of Calgary Press, 17-61.

115. Jacquemin, A. (1988), `Cooperative Agreements in R&D and European Antitrust Policy', *European Economic Review*, **32**, 551-60.

116. Gutterman, A. (1997), `Inter-Firm Co-operation, Competition Law, and Patent Licensing: A US-EC Comparison', in: S. Deakin and J. Michie (eds.), *Contracts, Co-operation and Competition: Studies in Economics, Management and Law*, Oxford: Oxford University Press, 370-91.

117. Baxter, W.F. and Kessler, D.P. (1998), `The Law and Economics of Tying Arrangements: Lessons for the Competition Policy Treatment of Intellectual Property', in: R.D. Anderson and N.T. Gallini (eds.), *Competition Policy and Intellectual Property Rights in the Knowledge-Based Economy*, Chapter 5, Calgary: University of Calgary Press, 137-52.

order to promote more effective inter-brand competition

In spite of these positive effects, competition policy authorities are properly concerned about licensing agreements, especially when licensor and licensee are actual or potential competitors. The first and strongest concern is that the agreement enables a cartel to fix prices, limit output or share-out markets. The elimination of competition could occur in the market for products manufactured using the innovation or in the market for the innovation itself. An important method for testing the likelihood of cartelisation is to consider how much of the relevant market is subject to restrictions. Furthermore, licensing agreements can be used to facilitate the implementation of other separate cartel understandings, for example, to detect cheating and to preserve stability. However, to be effective, such restraints would have to apply to a substantial portion of the licensees. A second concern for policy authorities is that licensing agreements should not operate so as to exclude other entrants, that is, the vertical restriction does not substantially raise barriers to entry by requiring entry at more than one level. Third, IP rights can be used to acquire market power when a licensor simply purchases exclusive rights in competing technology. This practice can be analysed in the same fashion as horizontal mergers, that is, by looking at the market shares controlled by the competing technologies. Such an analysis may be difficult because of the rapidly evolving character of the market for technology. Finally, a fourth concern is the possibility of non-price predation, which broadly includes any conduct designed to exclude rivals or to raise their costs on a basis other than efficiency. The major problem in this respect is to make a distinction between the various types of conduct which can raise rivals' costs and attack only those which are not based on efficiency.

We have identified the major arguments on the pro- and anti-competitive aspects licensing agreements. Many clauses, looked at in isolation, are neither good nor bad from the point of view of competition policy. A thorough evaluation of the general competitive impact requires an inquiry into the purpose and likely effect of clauses in their economic context, which asks for an examination of the horizontal and vertical relationship between licensor and licensee. Such an examination will involve a balancing of the risks of cartelisation or other effects of increasing market power against the benefits of a licensing agreement.

Parallel Imports

Parallel imports occur when original or `adjusted' (for example, repackaged) goods intended for sale in one national market are exported from their original destination to another country without the explicit permission of the original seller. This phenomenon is closely associated with the existence of separate, mostly national markets, in which price or cost differences are sufficient to compensate for transportation costs. These differences may be triggered by free-rider problems, price discrimination, distributor collusion and exchange rate adjustment lags (Hilke[118]). They all provide an opportunity for parallel importers to sell in a high-price area a product which has been obtained from a low-price area. In doing so, parallel importers are able to undercut the regular distribution network established by manufacturers. thereby increasing intra-brand competition.

As a rule, parallel imports interfere with vertical and territorial restraints in distribution and/or licensing agreements between manufacturers and their intermediaries. In getting around authorized distribution networks, parallel importers are likely to harm the interests of manufacturers and their distributors. Therefore, this group of rights owners, related companies, independent licensees and other authorized dealers try to block parallel imports in various ways. For instance, the group may use national laws on IP and/or private contracts to prevent parallel importation. (The blocking of) Parallel imports raise(s) a number of interesting but intricate policy problems (Chard and Mellor[119], Rhys *et al.*[120]).

118. Hilke, J.C. (1988), `Free Trading or Free-Riding: An Examination of the Theories and Available Empirical Evidence on Gray Market Imports', *World Competition: Law and Economics Review*, **32**, 75-91.

119. Chard, J.S. and Mellor, C.J. (1989), `Intellectual Property Rights and Parallel Imports', *World Economy*, **12** (1), March, 69-83.

By exercising her national right, the owner of an IP right can effectively block parallel imports by using it to thwart the goal of market integration. Granting exclusive rights to IP owners may fully separate national markets, which undermines the free movement of goods. Parallel imports would render a policy of market separation less effective but at the same time go against the economic rationale of IP law, which is to promote economic efficiency. Alternatively, private contracts between a rights owner and her intermediaries can be used to prevent parallel imports. These contracts might include direct restrictions, for example, export bans or less direct restrictions, such as prior approval of or higher royalties on exports. However, competition law may prevent IP rights owners from requiring that their intermediaries do not sell products for resale abroad. Firms are strictly prohibited from segmenting markets through either collusive behaviour or an abuse of a dominant position. Competition law has several sets of rules which may be used to regulate the use of national (intellectual) property rights in blocking parallel imports. However, the application of these provisions by the competition authorities and by the courts has been far from easy. Sometimes it seems that both institutions have developed a more or less diverging approach while addressing the same issue. Such differences may be detrimental to legal certainty and therefore, may have a negative impact on investment decisions of undertakings. Furthermore, the rules developed have been and still are, severely criticised by several commentators as being too legalistic, while not paying enough attention to the underlying economic factors.

The main advantage of parallel imports is their downward impact on prices (Liebeler[121]). For example, an active policy of differential pricing by manufacturers and/or their distributors may become less attractive due to this additional competitive pressure. Parallel importers stress their fundamental role within the price mechanism of a free market economy and emphasize the effect of parallel imports in undermining price discrimination. Price competition ensures that consumers get their products at the cheapest possible price and forces producers to strive for cost-effectiveness in distribution. In general, parallel imports seem to encourage efficiency and break down barriers to trade created by manufacturers and their distribution network. Parallel imports may have more or less the same impact on market segmentation caused by national IP laws. In this, parallel imports seem to be completely in line with the objectives of competition policy. Thus, the argument for a legal framework which explicitly permits parallel importing seems to be irrefutable (Rhys *et al*.[122]). However, there are some compelling arguments against parallel imports and they also have to be considered.

Manufacturers and their authorized distributors or licensees (together constituting the group of `rights owners') naturally stress these disadvantages in their campaign to bar parallel imports. Their opposition hinges on four basic legal, as well as economic, arguments which to a large extent, overlap and interlink (Chard and Mellor[123]). First, in law, they point to the separate and independent nature of national IP rights, which gives them the right to control what is released into each market and the terms on which it is released. Second, they claim that the authorised product released on the market is different from what the parallel importers are bringing in, especially if repackaging is involved. Different production costs or potential consumer confusion or deception justify a ban on parallel imports. The market imperfection involved here arises from the consumer's need for information and the costs of searching for it. The argument of efficient collection of information also applies to distributors and licensees with respect to forecasts of (future) demand

120. Rhys, J., van Dijk, T., Goate, P., Lewis, D., Gerner, F., Holmes, S., Rose, D., Usher, T. and Spilsbury, D. (1999), `Executive Summary', in: *The Economic Consequences of the Choice of Regime of Exhaustion in the Area of Trademarks*, London: National Economic Research Associates, S.J. Berwin & Co. and I.F.F. Research, i-xxiv.

121. Liebeler, L.H. (1986), `Trademark Law, Economics and Grey-market Policy, *Indiana Law Journal*, **62** (3), 753-77.

122. Rhys, J., van Dijk, T., Goate, P., Lewis, D., Gerner, F., Holmes, S., Rose, D., Usher, T. and Spilsbury, D. (1999), op. cit. supra note 120.

123. Chard, J.S. and Mellor, C.J. (1989), op. cit. supra note 119.

and to decisions regarding (future) specialised investments. Third, IP owners point to the different costs of marketing the product in different national markets, which may arise whether or not the physical product is the same. The costs involved, not present in the foreign market, may be caused by the size of the domestic market and the supply of special features, marketing and promotional activities as well as pre- and after-sales services. Parallel importers free-ride on these activities and services, thereby undermining their effective provision by authorised distributors. Finally, IP owners claim that higher risks of operating specific markets justify higher returns. For instance, additional efforts to penetrate new markets may require incentives, such as a higher rate of return. Again, parallel importers may be attacked as free-riders and stand accused for reaping without sowing (Abbott[124], Danzon[125]).

IP rights owners consider parallel imports detrimental to their legitimate interests and will try to prevent parallel imports in various ways. Most directly, where the principle of territoriality is applicable, national IP laws will be used to prevent parallel importation. Protecting exclusive property rights, however, might convey an economic monopoly, interfere with the freedom to compete as well as the free movement of goods. Whenever the doctrine of exhaustion is applicable, this possibility is limited (Rhys *et al*.[126]). A second line of defence against parallel imports might be to use contract law. Agreements, for example, with licensees or distributors might contain contractual arrangements, such as export bans or quality requirements, through which parallel imports are mitigated or entirely prevented. However, many countries enforce competition laws that prevent manufacturers from using too restrictive elements in private contracts to eliminate or mitigate parallel imports. A third possible response to the threat of parallel importation lies in vertical integration between manufacturers and licensees or distributors. Again, this possibility may be limited by the enforcement of competition laws with respect to vertical mergers.

Barring parallel imports through the exercise of IP rights and restrictive contractual arrangements raise problems from a competition policy point of view. IP rights are designed to promote the creation of technological and artistic innovations (intangible assets) and thus, to promote economic growth and consumer welfare by giving the innovator an exclusive legal right to the economic exploitation of his intangible asset that serves to reward the innovator for his investment and to engage others to innovate in the future. However, the right to exclude allows positive prices to be charged for the use of information and also tends to restrict the dissemination of innovations. In this respect, there seems to be an apparent conflict between the goals of IP law and those of competition policy. Competition policy generally is associated with efforts to promote short-run allocative efficiency though the more compellingjustification for IP law lies in its stimulus to long-run, dynamic efficiency (the invention and commercial introduction of innovations which promote welfare by increasing the quality of goods and productivity). Thus, the apparent natural conflict can be reconciled if consumer welfare is put in a long-run perspective. Accepting the importance of dynamic efficiency implies that the innovator is allowed to price innovations higher than their marginal cost. The key question then is how much reward is necessary to bring about a sufficient amount of innovation. In turn, this is of interest with respect harmonisation of national IP laws.

A brief mention is made here of the role standardisation plays with respect to IP-rights and competition law (Levin[127] and Farrell[128]). Much of what was said about pro- and anti-competitive aspects of licensing also

124. Abbott, F.M. (1998), `First Report (Final) to the Committee on International Trade Law of the International Law Association on the Subject of Parallel Importation', *Journal of International Economic Law*, **1** (4), December, 607-36.

125. Danzon, P.M. (1998), `The Economics of Parallel Trade', *Pharmacoeconomics*, March, **13** (3), 293-304.

126. Rhys, J., van Dijk, T., Goate, P., Lewis, D., Gerner, F., Holmes, S., Rose, D., Usher, T. and Spilsbury, D. (1999), op. cit. supra note 120.

127. Levin, R.C. (1978), `Technical Change, Barriers to Entry, and Market Structure', *Economica*, **45** (180), November, 347-61.

128. Farrell, J. (1989), `Standardization and Intellectual Property', *Jurimetrics*, **30** (1), Fall, 35-50.

applies to standardisation issues. The literature discusses the trade off between open standards and exclusionary property rights, as well as the relationship between competition law and the IP-system.

WTO/TRIPS

International co-operation for mutual enforcement of copyright for authors started in the mid-nineteenth century and was formalised in the Paris Convention of 1983 (for industrial property rights) and the Berne Convention of 1886 (for copyright). The Paris Convention led to national statutes for most industrial property rights, creating a basic level of uniformity (McKee[129]). Under the Berne Convention, national states enacted copyright statutes and courts enforce legal rights of authors and publishers who are nationals of signatory countries. Coverage of the Berne Convention has expanded along with national copyright law and in 1960 the Rome Convention was signed by some countries, giving international protection to the neighbouring rights of performers, film-makers, phonogram producers and the like, whose works were not included in copyright law as such in many countries and therefore required a separate agreement. The US was not a signatory of either Convention until 1989 when it signed the Berne Convention; it is still not a signatory to the Rome Convention as it does not have rights in sound recordings nor performers' rights. The World Intellectual Property Organisation (WIPO), created as a UN world-wide policy forum, works to promote harmonisation of all IP law. None of these bodies has the power to effectively enforce compliance except by exhortation and international disapproval. The formation of the European Union and NAFTA (North American Free Trade Area) necessitated further harmonisation of inter-country IP law so as to promote effective competition; these trade areas can ultimately apply trade sanctions and fines on offending national governments when they do not observe the law. The international agreement that has the greatest powers to enforce IP laws is the TRIPS (Trade-related Intellectual Properties) agreement of the GATT (General Agreement on Tariffs and Trade) which in the Uruguay Round, started in 1986, for the first time included `intangible' goods and services alongside primary and manufactured goods. Thus, copyright and other IP law became part of the business of international trade (Anderson[130]). International trade is now overseen by the WTO (World Trade Organisation, which replaced GATT) in which the US is the dominant member; this organisation has considerably greater world-wide trade sanctions available to give international enforcement of IPs real effect.

It is widely accepted that the US made virtually no concessions in the Uruguay Round negotiations of GATT and imposed upon the world not only the economic interests of its own IP-based industries - the cultural industries, computers, pharmaceuticals (Danzon[131], Bale[132]) and so on - but a degree of protectionism that is economically and culturally destructive to developing countries (Braga[133], David[134]) has argued that all countries throughout history, starting with Germany and England acquiring the technologies of the Venetian Republic in the 15th century, have copied the ideas and technologies of more developed countries and that was certainly true of the US during its own period of industrialisation. Bettig[135] connects the `copyrighting of culture', as he calls it, to the political economy of capitalist development in general in a

129. McKee, M. (1986), `You Can't Always Get What You Want: Lessons from the Paris Convention Revision Exercise', *Research in Law and Economics*, **8**, 265-72.
130. Anderson, R.D. (1998), `The Interface Between Competition Policy and Intellectual Property in the Context of the International Trading System', *Journal of International Economic Law*, **1** (4), December, 655-78.
131. Danzon, P.M. (1998), op. cit. supra note 125.
132. Bale, Jr., H.E. (1998), `The Conflicts Between Parallel Trade and Product Access and Innovation: The Case of Pharmaceuticals', *Journal of International Economic Law*, **1** (4), December, 637-53.
133. Braga, C.A.P. (1989), `The Economics of Intellectual Property Rights and the GATT: A View From the South', *Vanderbilt Journal of Transnational Law*, **22** (2), 243-64.
134. David, P.A. (1993), op. cit. supra note 18.
135. Bettig, R. (1996), *Copyrighting Culture*, Boulder, CO: Westview Press. p. 25.

persuasive book, in which he argues that copyright law is another weapon in the battery of property laws that are (mis)used to promote economic power and wealth. Moreover, he argues, wealthy individuals who dominate the communications and entertainment industries, are now globally supported by copyright law and its international enforcement through TRIPS. Reichman[136] discusses the demands that greater international protection due to TRIPS makes on the administration and law enforcement of copyright and other IPs in developing countries, which they may be unable to meet. Though Reichman freely uses the term `protectionism' pejoratively with respect to the strengthening of IP law for the benefit of developed countries, he does not appear to see the irony an international organisation (GATT) that was founded to promote free trade and dismantling tariffs and other barriers to trade advocating an IP policy which introduces unfair trading advantage. Reichman admits that most developing countries have no need of enhanced IPs and should demand other trade concessions in exchange but one has to write this off as exceptional naïveté about the balance of world economic power. The radical political economists have the advantage here.

Final Comments

It can be seen from this collection of articles that the scope and volume of economic analysis, like IP itself, have increased exponentially. For all the sophisticated analysis by economics, economic historians, law-and-economists and lawyers, we still cannot say with any conviction that in general IP law stimulates creativity or promotes innovation, though it may contribute to the process of communication between producers and consumers. That is no argument for not having it, but it should sound loud notes of caution about increasing it. We still know very little about its empirical effects. Therefore, despite the considerable literature on the economics of IP, which is represented but by no means exhausted in these volumes, there is much work still to be done on the economic effects of individual IPs as well as on the economic, social, political and cultural impact of IPs in general.

136. Reichman, J.H. (1997), `From Free Riders to Fair Followers: Global Competition Under the TRIPS Agreement', *New York University Journal of International Law and Politics*, **29** (1-2), Fall-Winter, 11-93.