2. Why patents need reform, and some suggestions for it

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There is an emerging consensus amongst users and students of the patent system that it is not performing as it ought to, and that this performance is getting worse. A recent comprehensive analysis of a large number of US empirical investigations concluded that:

> The performance of the United States patent system deteriorated markedly during the 1990s as the private costs of patent litigation soared.
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> By the late 1990s, the risk of patent litigation for public firms outside of the chemical and pharmaceutical industries exceeded the profits derived from patents. This implies that patents likely provided a net *dis*incentive for innovation for the firms who fund the lion's share of industrial R&D, that is, patents tax R&D. (Bessen and Meurer 2008, p. 144)

And since most other countries, as will be seen below, have replicated the US system, it is a reasonable assumption that this pattern is also the global one.

The simple reason why this has happened is that *it is nobody's business to see that patents work properly.* Consequently, they have been shaped by the interests of those who could benefit from them, rather than from any vision of the public good. The subtitle of the book from which the above quotation is taken is 'How Judges, Bureaucrats and Lawyers Put Innovators at Risk'.

I. INVESTMENT IN INNOVATION

Economic innovation depends upon investment, partly under uncertainty and partly under risk, which is uncertainty quantified. Investment under uncertainty can never be rational at all, and investment under risk can only be rational if there is the prospect of a reward that is commensurate with the risk as it is perceived. Since innovation is the turning of information into concrete reality, the risk has two dimensions: the attempt to innovate may fail; and even if it does succeed, it may not deliver the hoped-for returns because of others free-riding on the results. 'Information is hard to produce, easy to reproduce, and therefore difficult to profit by' (Nordhaus 1969, p. 144).

Preventing free-riding requires market power. This is not the power to make a market, in the sense of some physical or mental arena to which there is freedom of entry, and within which price is the arbiter between supply and demand, as in a stock exchange. Market power, in fact, is the precise opposite, being the power to *unmake* the market, by preventing entry to it by others. Freedom of entry drives price down, thus eliminating the reward that an investor in innovation has to have to justify his risk. Only market power, the power to *prevent* freedom of entry, can make it possible for an innovator to hope for the above-average returns that the above-average risk of investing in innovation demands.

II. TYPES OF MARKET POWER

Although patents are invariably thought of as the characteristic means of making it rational to invest in innovation, in fact they rank in importance far behind large-scale investments in capability and persuasion. Empirical studies on how firms capture the rewards from the results of their research and development (R&D) in the US, Europe and Japan all agree that, except for chemicals, patents are 'unambiguously the least central of the major appropriability mechanisms' (Cohen et al. 2002, p. 1360).

The market power of capability results from investment in productive assets, and the market power of persuasion results from similar investment in psychological assets, that is, in reputation. In each case, the power comes from *scale*. If a firm is able to produce on a larger scale than its competitors, it can then afford to innovate because its unit costs will be lower than theirs. Even if they can obtain access to the originator's information, they will be at a disadvantage in making use of it. The same is true if a firm is able to invest more than its competitors in building its reputation, typically through advertising. Firms which have less established reputation, known as 'brand equity', are correspondingly less able to copy with commercial success.

As long as these two types of market power are available to firms, therefore, we could expect that there would be economic innovation because of the protection they give to investment to produce information of certain kinds. But not all information can be protected in these ways, and consequently there is need for other kinds of protection also. For example, the end-product of pharmaceutical R&D is a chemical formula. Capability market power is a poor protector of this information embodied in a pill because, once the formula is known, manufacture of the pills in quantity does not require much investment in productive assets by someone who wants to compete. Similarly, if the pill is an effective remedy, it will sell easily without the need for much marketing effort, so again the market power of persuasion cannot set up much of a barrier

to entry by competitors. Consequently, if there is to be invention and innovation in cases where the information is of this kind, there is need for a third means of preventing free-riding. This is *specific* market power, of which intellectual property is an important component, and of course patents in turn are part of this.

III. EVOLUTION OF PATENTS

The forces in society which shaped the patent system in its origins did so in terms of a vision of the public good. Early patents protected innovation rather than invention, since their subject matter was technology found abroad and introduced to another country. The granting of a 14-year monopoly in England for bringing 'new manufacture within the realm' was typical of this kind of patent. The root of protection of invention rather than innovation is Article 1, Clause 8 of the *United States Constitution*, and a vision of the public good was again the shaping force. There can be little doubt that the motivation of the Founding Fathers for this was genuine belief that it was in the interest of society as a whole that there should be patent protection for inventors and copyright protection for authors.

Subsequently, until World War I, intellectual property laws, like all other legislation, were largely formulated by bureaucrats who were independent of politicians to a large degree and equally insulated from commercial interests. Civil servants regarded their function to be very much the definition and defence of the public good. Such an attitude is evident, for example, on the part of the German bureaucracy in shaping the famous *1877 Patent Act* there (Murmann 2003). This Act played an indispensable role in changing Germany from a poor country in the mid-19th century into a very rich one by the end of it, as the leading world player in the new chemical and electrical technologies. It also influenced patent legislation throughout Europe for three-quarters of a century.

However, World War I and the inflation which followed it destroyed the bureaucracies which could withstand political and commercial pressures. An early deployment of such pressures can be seen at the 1925 meeting of the Paris Convention at The Hague. From the Convention's establishment as the basis of internationalisation of patents and trademarks in 1883, there was no prohibition on any member country making local manufacture a condition of validity of a patent. In 1925, however, on the initiative of Britain and the United States, such a condition was outlawed from then onwards. These were the countries with most capability market power, and the change meant that they could now supply their foreign markets with products made at home. This enhanced their scale of operation still further, and at the same time they could

enjoy patent protection in their markets. Patents should be the means of enabling those who do not have the market powers of capability or persuasion to protect investment in generating information; the 1925 change can be seen as the beginning of a movement whereby they became a reinforcement of other kinds of market power instead.

IV. UNITED STATES 1952 PATENT ACT

The evolution of patent law then went on to reflect progressive shaping by the interests which benefited from it. A fully documented illustration of this is the way in which the *US 1952 Patent Act* was drafted and passed. Its cause was the incompatibility between the existing criterion for patentability and the new kind of research which lay behind the antibiotic revolution.

In 1941, the Supreme Court used the expression 'flash of creative genius' to encapsulate the level of ingenuity which it claimed had been necessary since the first patent Act of 1790. Such a criterion suited inventions made by individuals, which of course was the only kind of invention there was at the time of that Act, and for more than half a century afterwards. However, inventions coming from purposive, cooperative research in company laboratories, and from the application of science to industry, were progressively less able to meet this requirement. Eventually, no less than two-thirds of the patents coming before Circuit Courts of Appeal were being ruled invalid. What was described as an 'ever-widening gulf between the decisions of the Patent Office in granting patents and decisions of the Courts which pass upon their validity' was even the subject of a concerned Message from the President of the United States in 1943.[1]

This 'gulf' became a real crisis for the US pharmaceutical industry with the coming of antibiotics during and after World War II. The discovery of penicillin opened up an apparently limitless prospect of new drugs and profits, but the necessary investment in R&D could only be made on the scale which was desirable if effective patent protection were available for its results. At the same time, nothing could have been clearer than that research for antibiotics based on the techniques of large-scale screening which would be used, would be quite unable to supply the 'flash of genius' which the Courts required for patent validity.

Once firms in the pharmaceutical industry grasped that nothing could solve this problem for them except a change in the law, they moved very quickly. In 1948, the New York Patent Bar Association drafted a Bill and was able to get it introduced in Congress, and this, supplemented by other Bills and pressures, brought about the results that the industry wanted. This Act of Congress was given its form solely by those who would benefit by it. As a judge who, as a patent attorney had been the main drafter of the legislation, wrote later: 'The [1952] Patent Act was written basically by patent lawyers . . . A good 95% of the members [of Congress] never knew that the legislation was under consideration, or that it had passed, let alone what it contained.'[2]

The new US criteria for patentability were then copied by other countries, so that from the 1970s the patent systems of all the developed countries were based upon the United States model. Parallel with this, the Secretariat of the Paris Convention was becoming active in spreading patents through the poorer countries of the world. This was due to the zeal of its Director, Arpad Bogsch, which led to the recruitment to the Convention of most of the 141 countries that joined it after World War II. He developed a 'model law' of intellectual property which the poor countries could adopt, and cultivated and provided incentives for the politicians and bureaucrats who could arrange for the adoption of this law in their countries.

The model law was effectively the intellectual property law of the advanced countries of the Western world, and its promotion worldwide was done in the name of 'harmonisation', claimed to be in the general public interest. It was in fact the last kind of law which these countries needed, as demonstrated by the way India was able to build up a world-class pharmaceutical industry, specifically by *refusing* to join the Paris Convention. If it had done, it would have had to grant patents to the giant international pharmaceutical firms and its own infant firms would have been strangled at birth.

V. TRIPs

The most egregious example of how patent law came to be made by those whose interests are served by it is the Trade Related Aspects of Intellectual Property (TRIPs) annex to the World Trade Organisation agreement of 1994. The background to this was a normal ten-year updating of the General Agreement on Tariffs and Trade (GATT), but then, as described by Jerome Reichman (1998, p. 586),

> The momentum of the multilateral negotiations during the Uruguay Round carried the developed countries well beyond their initial goal, which was to limit the capacity of firms in developing countries to make and export free-riding copies of high-tech goods produced at great cost in the developed countries. Instead, by ... 1991, the developed countries' strategic goal was to impose a comprehensive set of intellectual property standards on the rest of the world.

Just how this was done has been well told by Peter Drahos and John Braithwaite in their *Information Feudalism* and in Susan Sell's *Private Power, Public Law*,[3] in which her expertise as a political scientist complements their expertise.

A key factor was the Intellectual Property Committee (IPC), initiated by the heads of Pfizer, IBM and Du Pont to lobby for change in international intellectual property arrangements. Sell points out that an important element in achieving this objective was extraction of US commercial policy out of its foreign policy. Once this had been done, the US Trade Representative was free to act on behalf of American business interests overseas in a completely predatory way, unconstrained by any of the factors that the President and the State Department also need to take into account in their decisions, such as the country's international reputation or its military alliances. Since the objective was to impose a world-wide regime in which intellectual property would provide reinforcement of firms' scale and scope, the IPC had little difficulty in recruiting support from similar interests in Europe and Japan. The upshot, as Sell (2003, pp. 92 and 95) put it, was that:

> The IPC, in conjunction with its counterparts in Europe and Japan, crafted a proposal based on existing industrialized country laws and presented its proposals to the GATT Secretariat. By 1994, the IPC had achieved its goal in the Trade Related Aspects of Intellectual Property ... accord of the Uruguay Round ... *In effect, twelve corporations made public law for the world.* (My emphasis)

VI. BILATERAL AGREEMENTS

In spite of this triumph of commercial interests over any concept of the public good in lawmaking, TRIPs did not work out quite as anticipated for US firms. Consequently, in recent years the US Trade Representative's policy has been to move towards bi-lateral agreements, in which America's greater economic strength can be deployed to the full. As one illustration of this, Australian experience has been the subject of a perceptive study (Weiss, Thurbon and Mathews 2004).

What is wrong with patents can therefore be summed up as follows: The justification for their existence is that they can enable investment in invention and innovation to be made rationally by those who do not have great capability or persuasive market power. Instead, patents have been allowed to become a reinforcement of these market powers, rather than an alternative to them. This means that smaller firms and smaller countries are greatly disadvantaged relative to larger ones in terms of innovatory capacity.

Hope of changing this situation requires sharing Keynes's belief that 'in the last analysis, it is ideas rather than vested interests, which are dangerous for good or ill' (Keynes 1936, p. 384). It gains some support from the way in which the educational efforts of organisations such as Oxfam and the Quaker United Nations Office produced a coalition of poorer countries at the Doha and Cancun TRIPs revision meetings. This has mitigated some of the worst features of

TRIPs, notably in relation to sourcing generic drugs. And even within the restrictions of TRIPs, some useful general improvements appear to be possible.

VII. MAKING DISPUTE SETTLEMENT EASIER

A major deterrent to rational investment in invention and innovation is the cost of defending patents or of otherwise being involved in litigation. Firms with large resources for this can intimidate those that are weaker, and almost invariably do so. By far the greatest practical encouragement for small-firm innovation, therefore, would be an inexpensive, quick and simple means of resolving disputes. One practical approach to this would be to introduce compulsory technical arbitration before litigation is allowed to commence.

It is because of the use of arbitration that so few disputes in technical areas other than patents ever reach the Courts. In fact, patents are unique in the world of technology in not using this device to reduce the cost of dispute resolution. The difference between other technical areas and patents is that in the former the parties involved are related by a contract, which invariably includes the arbitration condition; obviously, there is no contract between two parties in contention over a patent. For settling patent disputes, therefore, any provision for technical arbitration can only be in the contract which does exist – the one between the inventor and the state, that is, the patent grant.

TRIPs requires that settlement of intellectual property disputes should be dealt with in the Courts of each country, so there would have to be a right of appeal to the Courts from an arbitrator's decision. It might therefore be argued that compulsory technical arbitration of disputes would only push back the advantage of the party with more resources for a limited time period. Intimidation would re-emerge in the form of strong firms forcing weaker ones to face the costs of appeals to the Courts.

This could be solved by provision of legal aid for the respondent party, that is, the one which accepts the arbitration and does not appeal. Small firms would never appeal, since to do so would move the dispute on to the ground where their larger opponents have all the advantage of resources for litigation; larger firms would be cautious about appealing because judges pay a lot of attention to technical expertise and there would be no certainty of winning an appeal, having lost the arbitration.

It is likely enough, therefore, that the total amount required for legal aid payments would be low. In any event, whatever the cost to the State of legal aid for the party that accepts an arbitration might be, it should be regarded exactly as a counterpart to the necessary expense of conventional policing of other kinds of property. If exclusive privileges are to be real property rights, the State cannot escape having to spend money on their protection.

VIII. LARGE-SCALE WORKING MODEL

The likelihood that appeals from compulsory technical arbitration would be few is confirmed empirically by results from the 'Interference' files of the United States Patent and Trademark Office. 'Interference' is a procedure necessitated by the US requirement that patents are granted to the first to invent, not to the first to file. Consequently, when it is noted that two (or more) applications that might possibly be for the same inventive entity are received by the Office, all parties must provide evidence as to their respective dates of 'conception of the invention' and of their efforts to reduce it to practice. There are about 200 such 'interferences' each year and the probability of an applicant for a patent becoming involved in this procedure is about three per thousand.

The Board of Patent Appeals and Interferences, which decides on the evidence submitted, acts through Administrative Judges, who are recruited from the most experienced members of the Patent Office's Examiner Corps. They deal with every possible element in a patent dispute – novelty, non-obviousness, unity of invention, nullity factors – everything which in a dispute *after* a patent grant could be the subject of litigation. Interference procedure, therefore, is precisely *an actual large-scale working model of compulsory technical arbitration by experts.*

Two of these Administrative Judges made a particular study of the working of this procedure over a nine-year period, and found that between 40 and 50 final decisions were delivered each year. Just over one-third of these were appealed to the Courts, but *only about 5 per cent* of them were either wholly or even partially reversed.[4] All in all, therefore, in terms of how few of its decisions are successfully appealed to the Courts and of how many of its cases reach voluntary settlement, the performance of compulsory expert arbitration in the United States interference procedure is a very good augury of how well a similar system could work for settling disputes after patent grant. Any arrangement that works 95 per cent of the time, after all, is giving at least as good a result as can reasonably be hoped for in human affairs.

IX. DECLINE OF PATENT QUALITY

The issue of patent quality has become a contentious one everywhere, most of all in the United States because of the grant of patents for computer software and business methods there. One of the reasons is growth of the practice of 'trolling', where firms are held up to ransom by claims that they are infringing a patent. Those who make such claims generally manufacture nothing themselves and have often bought the patent in question from a bankrupt firm.

They make money through threats of litigation, especially by seeking injunctions which could bring part of their target firm's manufacturing to a halt and wreck a market. Because the dangers, costs and delays of litigation are so great, firms frequently pay up rather than fight (Reitzig, Henkel and Heath 2007).

It is an ominous sign that patent litigation costs in the US have been growing at a faster rate than firms' investments in R&D. An important reason for the high cost of settling patent disputes is that the information on which a patent is based at the time of its grant is incomplete to one degree or another. The ideal, which of course is a patent issued after a perfect search carried out by an omniscient examiner, is impossible of achievement. If prior art searches could be perfect, trolling could scarcely exist and litigation would be greatly decreased. But, just as in the *Diamond v. Chakrabarty* case, the US Supreme Court ruled that 'anything under the Sun that is made by man' is patentable, so 'anything under the Sun' can be prior art. It can be foreseen, therefore, that no patent office will ever be able to offer an absolute guarantee that it has taken all relevant information into account in deciding on a particular case.

As has been seen, the US Patent Act of 1952 delivered a patent system suited to the pharmaceutical industry, which had designed it. Since chemical inventions rely almost completely on the patent system for protection, virtually every chemical invention is patented. As a result, even if a prior art search is limited to issued patents, it works well for these inventions. For other kinds of invention, especially in fields where patents have only been operative in the fairly recent past, much of the prior art is outside the patent records. Examiners have tended to miss this, with the result that many patents have been shown to be invalid by searches carried out later by experts outside the patent Office, often as a result of litigation.

X. 'OPEN REVIEW'

In terms of establishing conditions conducive to innovation, it cannot be right that a patent on the basis of which investment has been made should be invalidated, and the investment lost, because of the later discovery of prior art in a foreign-language journal which had never been translated, as has often happened. The information in question would probably only have been discovered because of intensive search effort by a competitor of the patentee firm after the latter's investment had been made and even possibly when a product was on the market. An inventor's or a firm's competitors are far more likely to be aware of relevant non-patent prior art than any individual patent examiner could possibly be, and they will also be motivated to call attention to it.

This has led to a general call for means of improving the comprehensiveness of prior art searches, including the idea of opposition *before* examination, which would maximise the amount and quality of relevant information available to a patent Examiner. What is called *open review* would force this type of effort to be exerted before the patent grant, and would thus save wasted investment errors in both human and financial terms.

It is clearly absurd to continue to issue patents on an inadequate basis of information, when this could be provided by bringing the proved enormous power of open source – the collective intelligence that the Net now makes possible – to bear upon it. Wikipedia, for example, the result of large numbers of voluntary submissions, has been shown to be little less accurate than *Encyclopaedia Britannica*, for all the costly resources which the latter requires. Open review should prevent many patents from being wrongly granted in the first instance. It could also significantly increase the value of the patent grants that *are* made, because a community of experts will have contributed to their prior art search.

The Community Patent Review project of New York University and the United States Patent and Trademark Office (USPTO) is a pilot study of this approach. Several firms of the calibre of IBM, Microsoft, Intel and Hewlett-Packard, as well as some smaller ones, have agreed to allow 250–400 of their software-related patent applications to be published immediately for the world to evaluate (IBM, in fact, has decided to open *all* its future applications in this way).[5] Part of USPTO's contribution to this pilot study is to give priority to such applications in the subsequent process of deciding their patentability.

XI. 'AGREED PATENT DATABASE' AND INCONTESTABILITY PERIOD

The Gowers Report (2006) recommended that the US pilot study should be replicated in the UK, and a group of reform-minded inventors there has proposed to the authorities that modern information technology now allows for an open source database to be developed for use in patent examination. Any party could add information to this, submitted presumably according to a primary reference in the Classification. It would then be the job of the Patent Office to do the cross-referencing which would enable all the data to be picked up for examination of a patent application. In the event of a later dispute, only information already in this database at the time of examination could be used to settle questions of novelty and non-obviousness.

In the long term, the most valuable prize from success of open review and an agreed prior art database would be the ability to take the step of making patents *incontestable* for some period of their life. Just how great the gain could be in terms of increased incentive for innovation can be seen from the results of the US Orphan Drug Act of 1983.

The background to this is that there are numerous disorders ('orphan' diseases) which affect too few people to justify the investment that large drug firms have to make to produce a profitable product under present arrangements – including the cost of patents to protect them. This Act empowered the Food and Drug Administration (FDA) to fill this gap by offering to any firm that produced a relevant drug an undertaking that it would not license a competitor for seven years. This is effectively an incontestable grant of an exclusive privilege, since no drug can be put on the market without FDA approval. It is worth far more than any patent, since there can be no risk of being involved in litigation.

The outcome of this legislation has been spectacularly successful, reflected in a 12-fold annual increase in new 'orphan' drugs, with both actual and relative declines in death rates from the diseases they treat. We can be certain, therefore, that before it, the potential for innovation of drugs of this kind was not being exploited because the arrangements for protecting the results of the risky investment needed for this – predominantly patents – were not considered to hold out enough prospect of profit. In contrast, the protection offered by the Orphan Drug Act is certain, complete and eliminates all danger of litigation costs. The benefits could not be clearer, nor could the lesson that can be drawn from them: appropriate protection results in more innovation.

A period of incontestability might be offered only to smaller firms at the outset, since they could benefit most from it. The Research Fund of the European Patent Office funded research into this. When small-firm patentees with experience of infringement were asked, 'what would it have been worth to you if the defence that your patent was invalid had not been available to your infringer?', 75 per cent thought that it would be worth either 'a lot' or 'very much'. In contrast, the overwhelming view of patent agents, presumably reflecting the conflicting interest of their large-firm clients, was against the idea of incontestability.

If it were to be pursued, it would require smaller firms to agree to have their patent applications published immediately, that is, they would give up their entitlement to the 18 months' period of grace for this under present arrangements. There would then be a short period of months during which all concerned could provide information to the Patent Office for consideration by the Examiner. The validity of patents which were issued after consideration of this and any other information available could then not be questioned for a specified period.

There seems to be no reason why, if this proved successful in operation, it might not then be possible to grant an automatic first period of incontestability to all patents as from the date of grant, reflecting a basic level of presumption of

validity, and a second, longer one, once the outcome of some form of opposition procedure had strengthened this presumption. This would contribute to solving the disincentive effect of patents on innovation by removing the fear of litigation.

XII. PROTECTING INNOVATION DIRECTLY

The way in which the patent system evolved, especially in terms of the cost of settling disputes, rendered it of relatively little use to smaller firms, and the spread of 'harmonisation', especially in its extreme form of TRIPs, rendered it positively disadvantageous to smaller countries. Some improvements which could be made, even within the TRIPs strait-jacket, have been suggested above, but by far the best potential is for quite new arrangements which would protect innovation *directly*.

Invention is finding new things and innovation is getting new things *done*. At present, innovation is protected only indirectly, through whatever protection its related invention is able to obtain. It therefore depends upon the strength of the invention–innovation link. This explains why pharmaceutical inventions are well protected by the system: in this case the link between invention and innovation is very close, because what is discovered in the laboratory, what is described in the patent specification, what is circumscribed by the claims of the issued patent, what is made in quantity in the factory and what is ultimately prescribed by the medical practitioner, dispensed by the pharmacist and administered to the patient, are all absolutely identical. In contrast, for example in the case of engineering innovations, the actual link with the related invention is nothing like so close, as there will almost certainly be a number of incremental changes between the start of development work on such an invention and the time a product is finally put on the market.

Since the investment required for innovation is on a far bigger scale than that for invention, it has correspondingly more need for protection. There is no reason why it could not be protected directly, through arrangements which would operate alongside the existing patent system and make up for several of its shortcomings. As the English Court of Appeal judge, Lord Jacob, put it in a recent case,

> One can, of course, postulate a different policy under which a [patent] monopoly might make sense. There are old or obvious ideas which take a lot of work, expense and time to develop and turn into something practical and successful. Without the incentive of a monopoly, people may not do that work or spend the time and money. The Fosamax case, Teva v Gentili [2003] EWHC 5 (Patent), [2003] EWCA Civ 1545, is an example of an obvious invention which cost lots to bring to market. But patent law provided no protection for all that investment because the basic invention was obvious. The courts' job is not, however, to uphold any claim to a monopoly for an idea which requires investment and risk to bring to market, only those for ideas which are new, non-obvious and enabled.[6]

XIII. INNOVATION PATENTS AND WARRANTS

Two ways of achieving what the judge postulates have in fact been advanced. These are Herman Kronz's *Innovation Patent* and the writer's slightly different *Innovation Warrant*. The EU commissioned and published a study in which a number of world experts evaluated both approaches (see Kingston 1987). Although this was done before evidence of the success of the US Orphan Drugs Act of 1983 was published, that evidence is strong confirmation of the direct protection approach. The orphan drug protection is given, not for a concept of a new drug, or even for one that has reached the stage of clinical trials, but only for the actual drug, developed, fully tested and ready to go on the market. The EU's Directive for the protection of databases is also a form of direct protection of innovation.

Both versions evaluated in the EU study shared a number of features. The arrangements would be administered by an independent Innovation Authority, although a high value is set on eliminating official discretion. The subject matter of protection would be innovation, not invention. Protection would be offered before investment has to be made, but actual investment would be the condition of activating it and keeping it in force. Any economic object could be protected, not just technology. The novelty criterion would be 'non-availability in the ordinary course of trade'. The term of the protection would be variable, and examination would rely heavily on Third Party involvement – an anticipation of the open review concept. All grants would be incontestable except in cases where they had been obtained by fraud, and there would be no renewal fees to keep them in force. Terms of grant could differ between regions of a country (or could apply over more than one country by agreement).

XIV. MEASUREMENT BY MONEY

A feature of these proposals which deserves special mention is that measurement of the protection granted would be through money, not time, since this would also be a much better way of dealing with classical intellectual property grants, if this could be reconciled with TRIPs. A time measure of exclusive rights can never be anything more than a surrogate for money. If all inputs and outputs could be measured accurately, then the logic of any grant of an exclusive right

would have it last until an investor in R&D had received as profit a socially acceptable multiple of the investment made.

This multiple would take account of its subjectively assessed risk, and would in fact be the reciprocal of that risk. With a lower multiple, the risk would be regarded as too high and the investment would not be made, thus possibly depriving the public of something new and useful; with a higher multiple, the protection – and consequently the private benefit – would be more than it needs to be, and the public benefit (in terms of lower prices and/or improved products from competitors) would be correspondingly less. When the practicalities of this were investigated, however, it soon emerged that it would be very difficult to devise a tamper-proof system.

In contrast to any accounting measurement after the event, focusing on the investment which had to be made *beforehand* to bring about an invention or innovation is much more promising. It is even more so if it is combined with compulsory licensing, so that an exclusive right would change from that of 'making, using and selling' to that of conditionally *allowing others* to 'make, use and sell' (Kingston 1994). The concept of the multiple in the ideal (but impractical) approach could then be applied instead to defining how much should be paid for a compulsory licence.

Access to an invention by competitors is a most important point: inventions only become useful to the public (and consequently profitable) by incremental improvements, and no originating firm can devote its resources optimally to more than a single 'trajectory' of these. During whatever period the originator's intellectual property protection of the present kind remains effective, other firms that are capable of developing the invention along alternative trajectories of incremental innovation may be prevented from doing so. Boulton and Watt's patent postponed the development of high pressure steam and that of the Wright Brothers slowed down aircraft design.

It is only through these alternative trajectories of relatively small technical changes that the widest range of user and consumer wants can be satisfied; that dynamic new firms are able to get a start in new technology; and – in the long run – that prices of the standardised products that eventually emerge are brought down through competition.

But if competitors are to be allowed access to the results of an originator's investment in R&D, the system must ensure that they pay appropriately for it. This means making a second- or later-comer share *retrospectively* in the investment which had brought the information they want to use into being. The amount payable would have to be weighted by the risk the originator had taken. That weighting should also reflect the reality that the very first money that is put behind an idea involves uncertainty rather than risk, and is to that extent irrational.

No matter what the advantages of compulsory licensing, it would be essential that it did nothing to reduce the incentive to undertake the high risk of investment in invention and innovation. A safeguard for this is that the more important any information is seen to be by competitors, the more licences will be requested for it, and as each licence would earn the same amount, the originator could find that his risky investment was very well rewarded. This reward might be much greater than could have been achieved under traditional protection, because several trajectories of incremental development would be exploited simultaneously, which is the best possible way of expanding the total market for the originator to exploit. At the same time, no firm would be prevented from developing any new market as long as it was ready to share retrospectively in both the investment and the risk which had made that market possible.

XV. CAPITAL PAYMENTS INSTEAD OF ROYALTIES

A further safeguard for originators would be if payment for licences was made through one-off capital amounts, rather than by royalties. This would reinforce the principle of having the second- or later-comer share retrospectively in both the amount and the risk of the investment which has been made. Any such investment is now a sunk cost for the originator, and there is no reason why any sharing of the result should be dependent on a licensee's future success in using it, as would be the case with royalty payments.

Also, a licensee who has made a capital payment for access to information is more likely to be motivated to get the best possible value out of the information which this licence has bought, by doing his own development work on it. This motivation is not necessarily present to the same extent when payment for the licence is contingent, that is, through royalties. Firms which can license information on a royalty basis may be content simply to produce clones of the originator's product. The public interest is best served when the firms which obtain compulsory licences will themselves do R&D to exploit independent trajectories of incremental innovation. Having invested a significant capital sum for the licence adds greatly to the incentive for this.

It should be stressed that the multiple would only set the price at which the originator of information would *have* to grant a licence for its use by another. The proposed arrangements would not prevent any type or number of licence agreements between mutually willing buyers and sellers. Any licence which would be granted under the present system, therefore, would equally be available under the new one.

The public interest requires that inventions should be made, then innovated, and then diffused as quickly and as widely as possible. Wide diffusion implies the possibility of several trajectories of incremental change. Unfortunately,

much innovation diffusion at present is the result of failure of the patent system to deliver the protection it promises – especially in non-chemical fields. It would clearly be much better to use the proposed new arrangements to get the process of diffusion started in an orderly way and as early as possible.

XVI. CONCLUSION

The various proposals outlined above could be useful in enabling patents to perform the only function which justifies their existence. This is that they deliver the market power necessary for rational investment in innovation to those who do not have this market power in other ways, such as through large-scale investment in productive assets (for capability) or in advertising and marketing (for persuasive market power).

Just as the US began to by-pass TRIPs when it discovered that it was not working as much to its advantage as had been hoped, smaller countries, all of which are disadvantaged by TRIPs, could work around its provisions in their own interest by adopting some of these proposals. Specifically, direct protection of innovation could be put into effect in parallel with the existing patent system and without being affected by TRIPs at all. It could be introduced without being applicable to chemical inventions, which are already well served.

All smaller countries have suffered from 'harmonisation' and need to develop some countervailing force in intellectual property to that of the 'trilateral', the arrangement between the Patent Offices of the US and Japan and the European Patent Office, which arranges settlement matters in the interests of their largest users, the multinational firms, especially those in the pharmaceutical industry.

The way in which the international patent system has evolved is proof positive of Mancur Olson's theory of collective action (Olson 1965). This is that small cohesive groups have great advantages in getting laws that suit them, over large, diverse ones. In the patent case, the small number of large firms, especially multinational firms, has been able to shape the patent system in their own interest, to the disadvantage of smaller firms, which are greater in number but which do not act in unison.

What is true of small firms is also true of smaller countries. The history of TRIPs makes it clear that their performance when it was being formulated and enacted was totally passive. It appears that they have never thought of taking advantage of Article 19 of the Paris Convention to improve the capacity of their firms to innovate. This Article is:

> It is understood that the countries of the Union reserve the right to make separately between themselves special agreements for the protection of industrial property, in so far as these agreements do not contravene the provisions of this Convention.

Taking advantage of this would enable any group of member countries to agree to mutual arrangements for operating any or all of the suggestions for repair of the patent system outlined above, and others, as long as they also allowed any other country which was a member of the Paris Convention to share in the benefits. Just as Doha marked the beginning of the necessary reaction against TRIPs, such a group could begin a useful reaction against harmonisation.

NOTES

1. Transmitting the Report of the National Patent Planning Commission, 18 June 1943.
2. Judge Rich, quoted by P.J. Federico in Witherspoon (1978).
3. Drahos and Braithwaite (2002); Sell (2003).
4. Calvert and Sofocleous (1989, 1992, 1995).
5. See: http://www.peertopatent.org/.
6. *Angiotech Pharm., Inc. v Conor MedSystems Inc.*, [2007] EWCA Civ 5, 50 (Court of Appeal 2007 (Jacob, L.J.), aff'g, [2006] EWHC 260 (Pat) (Pumfrey, J.) (High Court 2006).

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