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POLICY PAPER

Transforming the Conditions for Indigenous Innovation

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Abstract: Ireland joined the international patent system in 1925 in total ignorance of its implications, and this membership has done very little for indigenous innovation. India refused to join, which enabled its own firms to become significant international players in several fields, especially generic drugs. The contrast with the foreign-owned Irish pharmaceutical industry, facing decline as its patents expire, is stark. The government's adoption of a simplistic linear model of innovation, in which public money put into university research was supposed to result in valuable patents, high-tech firms and jobs, has also been a grave disappointment.

Ground could be made up by adopting direct protection of innovation (DPI). The theory for this was developed in EU-commissioned research, now proved by empirical results. This paper discusses practical arrangements for DPI in Ireland, as well as a proposal for enabling Irish firms engage in effective litigation to protect their patents in the United States.

I INTRODUCTION

The present economic crisis reflects a calamitous shift from technological to financial innovation, telling indicators of which are how profits and pay in financial services outstripped those in technology, sucking investment and brainpower from one to the other. At the peak of the boom, financial sector profits reached 45 per cent of all profits, and pay in the sector was 70 per cent higher than elsewhere (Philippon and Reschef, 2009).

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There is no shortage of proposals for fixing the financial side of the problem, but this paper focuses on the other side, how to make investment in technology attractive. In other countries, this would mean "attractive *again",* because they have lost whole industries based on it. As long as Britain was an important manufacturing country, for example, banking assets were only about half of national income; but financial deregulation allowed them to increase to *more than five times* income (Sheppard, 2006 and Bank of England Annual Reports). The Irish Republic never had indigenous industries based on technology to any significant extent, so that for it the policies needed would be radically new. This means developing laws that match information protection to economic innovation.

These would involve radical institutional change in Ireland. The country's electoral system puts exceptional pressure on politicians to govern by intervention rather than by making laws within which individuals are free to act (Kingston, 2007 *passim*). The Irish economic record is a poor advertisement for such policies, and this is nowhere clearer than in relation to innovation. To take just one example, "… the Irish IT industry has fared so much worse than other emerging economies at the same time as the state has given it higher priority and channelled more resources its way than ever before" (Breznitz, 2012, p. 106). One reason for this is that the relevant laws are inappropriate, and unless the laws are right, intervention cannot work. Centralised administration can only succeed to the extent that it is based upon substantially complete information. Innovatory action such as software development is characterised precisely by *the absence* of information, for which imagination has to substitute as far as it can.

This basic incompatibility explains why individual property rights have shown themselves to be the most effective way to make economic innovation possible, because they support the widest range of human creativity and imagination. These rights include patents, but the laws governing these have been vulnerable to capture by interests. Over half of the value of all worldwide patents now accrues to a small number of large pharmaceutical firms. This is hardly surprising, since the US 1952 patent legislation was written by their industry's lawyers, and that law has since been copied by the rest of the world (Kingston, 2010, p. 102). The TRIPS annex to the World Trade Agreement of 1994 requires member countries to adopt the patent regime which was devised in the interest of the largest countries and firms, and imposed on others through massive and skilful lobbying: "In effect, twelve corporations made public law for the world" (Sell. 2003, p. 96). Patents should give particular incentives for investment in the innovations of small firms and small countries, but they now do the opposite instead.

II PROTECTING INFORMATION

2.1 *Patents in Ireland*

Ireland first encountered this type of law in 1925, when it joined the International Convention for the Protection of Industrial Property, generally known as the Paris Convention, purely as a gesture of independence, without discussion in the Dáil, the Seanad or even by the Cabinet. Membership of this allows a country to have any type of patent or trade mark system it wishes (or none at all, as was Ireland's position at that time) as long as it treats the citizens of any other member country in the same way as its own nationals.

However, when introducing the first Patents Act in 1927, the Minister of Industry and Commerce enunciated a principle which has since been followed assiduously, that "… the better way is to legislate all that the Convention seeks to achieve". He was apparently quite unaware that the Convention had not been drawn up with the interests of small and poor countries in mind. In fact, in the same year that Ireland joined the Convention, a requirement for local manufacture for a patent to be valid, was eliminated from its rules on the initiative of the US and Britain, whose export industries gained from this change. The original rules could have been useful for the new state, by adding some element of invention and innovation to the firms which subsequently came into being through industrial protection policy, and which notoriously lacked either (for details, see Murdoch, 1971).

The result has been uncritical following the features of the international system, which reflect the interests of the most advanced countries. The Irish 1964 Patent Act simply followed the 1952 legislation in the United States. When attracting foreign investment became basic industrial policy, any hope of changing the law to suit local firms was lost, in favour of being able to stress to potential US investors that they would find the system that suits their interests here. British functional design protection, which could have been useful for indigenous businesses, was actually introduced in Ireland through a High Court judgment, but was immediately negatived through legislation initiated by the Industrial Development Authority in the interest of one of its multinational clients (Kingston 2007, pp. 61-62). Against such a background of passivity, therefore, it makes little difference that Article 118 of the Lisbon Treaty replaces the case law of the European Courts of Justice that patent and similar laws were "a matter for the individual States" by transferring all power in this respect to Brussels.

2.2 *Contrast with India*

Joining the Paris Convention proved to be a bad bargain for this country because the Agreement's operating principles give all the advantages to

foreign firms that are at the cutting edge of technologies. The contrast between the responses to this of Ireland and India is particularly striking. When India became independent in 1947, it took a diametrically opposite course to Ireland, decided not to join the Convention, and formulated a patent law to suit itself. This was because it wanted to develop an indigenous pharmaceutical industry. It has been outstandingly successful in this, to the extent of now being an important international player (Drahos and Braithwaite, 2002). The same industry in Ireland is overwhelmingly foreign-owned and, as happened to the Dell computer firm in Limerick in 2009, it can be moved at any time to countries with lower costs. The likelihood of this increases as the international patents on the drugs made in Ireland expire.

All resources, however, are not exhausted, and the fact that Ireland no longer has power to shape its own patent laws need not mean that its authorities are without the power to make the country a more attractive place in which to invest in economic innovation. The very inadequacy of the existing laws for protecting information provide an opportunity to benefit from improving them. Among the contributions of Joseph Schumpeter to economics was an understanding of long economic cycles, and how these are initiated by "clusters" of innovations (Schumpeter, 1939). Historically, there has been a remarkable coincidence between such clusters and legal changes which improve the protection of information. The institutional change that could stimulate the next long technological cycle is that of protecting innovation *directly.*

2.3 *How Patents Work*

Whatever protection technical innovations obtain from patents is only *indirect,* through their connection with a related invention. It therefore depends upon the closeness of the correspondence, and the strength of the link, between the information and its embodiment. In chemicals, this link is strong and correspondence very close; indeed, for pharmaceutical products it amounts to formulaic identity: What is discovered in the laboratory and patented, what succeeds in clinical testing; what is manufactured in quantity and what is eventually prescribed by the physician, delivered by the pharmacy, and taken by the patient, are all (indeed, must be) exactly the same. For this reason, protection of invention, which is indirect protection of innovation, is effective for such products.

For other kinds of products, there is only a poor correspondence between what customers actually hand over money for and any invention associated with it (Chester Carlson's 1942 plain-paper copying invention is hardly visible through the complexity of even early Xerox machines). The link between invention and innovation is weak, so that the protection which innovations of

this kind can receive indirectly from patent protection, is almost always inadequate to justify investment and can often be worthless. The different strength of these linkages across technologies is enough on its own to explain why Bessen and Meurer (2008) have calculated that two-thirds of all worldwide profits attributable to patents are made by firms in the chemical industry.

The problem of protecting innovative *products* is illustrated in a recent observation by a judge in the English Appeal Court:

> 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 (Jacob, 2007).

2.4 *Direct Protection of Innovation (DPI)*

"Protection for all that investment", however, could be provided *directly,* as is already the practice in several fields. It has in fact been the primary method of protecting new plant varieties since 1961, through the International Convention for the Protection of New Varieties of Plants (UPOV). Membership of this, in contrast to the Paris Convention, has been of great value to Ireland. Indeed, it is possible to speculate that the foreign exchange earned by the new types of potato developed by Teagasc's research, has been more than that from all patents owned by indigenous firms. Protection under UPOV does not depend in any way on the strength of a link between an invention or discovery on the one hand, and its actual embodiment on the other, as it would under a patent. It is granted, not for the concept of a new plant variety, nor even for a variety which shows promise in field tests, but for the fully developed plant, capable of being reproduced in quantity, fully proved in trials and ready to go on the market (UPOV, 2006).

2.5 *Origins and Applications*

Proposals for DPI in industries where patents work poorly were first made independently in publications by Dr Hermann Kronz, a Patent Attorney (1976, 1983) and this author (1981). The European Commission then funded research leading to a book on the concept which included evaluations of it by international experts (Kingston (ed.), 1987). DPI had been applied in practice

in the US Orphan Drug Act of 1983, and the British Copyright, Designs and Patents Act of 1988 then used it in its protection of "basic inventions that are obvious". An EU 1996 Directive protects databases directly, and in 1998 the US introduced direct protection of boat hulls which have not just been designed, but actually moulded. The system has recently been the subject of reviews by Sichelman (2010, 2011).

The evidence of the potential value of DPI from the results of the US orphan drug legislation is particularly persuasive. The background to this is that there are numerous disorders (orphan diseases) which affect too few people to justify the investment which large drug firms have to make to produce a profitable product under present arrangements – including the cost of patents to protect them. The 1983 Act empowered the Food and Drug Administration (FDA) to fill this gap by giving an undertaking that it would not license a competitor for seven years, to any firm which produced a relevant drug, ready for the market. Such an award is a true monopoly, since no drug can be sold in the United States without an FDA licence. This legislation was so successful that it has been copied in Europe (in 2000) as well as by Japan and Australia.

However, in the context of the present proposal its importance is that it is precisely a form of DPI. In the same way as UPOV's protection of new plant varieties, it is granted, not for the concept of a new drug, nor even for a drug which has passed laboratory tests, but for the drug as a concrete reality, fully clinically tested and ready to go on the market. Its protection is certain and complete and it eliminates all danger of litigation costs.

2.6 *Empirical Results*

Because of the way in which orphan drug protection makes this type of innovation such an attractive investment opportunity, it has been spectacularly successful, with a twelvefold annual increase in new drugs and both actual and relative declines in death rates from the diseases they treat, over the first 20 years of its existence (Grabowski, 2005). The lesson that can be drawn from these figures could hardly be clearer: appropriate protection results in more innovation. DPI can fill the gap referred to by the English judge, by greatly increasing the attractiveness of investing in ideas for new products or improvements to existing products which do not meet the criteria for patent protection. A patent is granted for information which must be new in the whole world; DPI would be granted for investment to innovate information which may not be new as such, but which has not yet been embodied in a particular manner, in a prescribed geographical area.

There is plenty of evidence, therefore, that DPI works, which opens up an opportunity to introduce it more generally, to fill the gap currently left by

patents. DPI would not replace existing protection arrangements in the slightest degree, but would supplement them. It has the great advantage as means of encouraging innovation that all losses are borne by those who hoped to gain from investments at high risk, whereas with other attempts to encourage innovation such as subsidy, these losses are borne by the taxpayer. The introduction of DPI could begin with mechanical and electrical innovations, because the patent system works least well for these. The more important features of a DPI regime and the ways in which it differs from the patent system, include the following:

III FEATURES OF A DIRECT PROTECTION OF INNOVATION REGIME

3.1 *Criterion of Novelty*

The qualification for protection under DPI would be "non-availability in the ordinary course of trade". This criterion was developed quite independently by the two authors of the original articles in which the concept was first put forward. The UK functional design protection is granted if the subject matter is "not commonplace", and the relevant case law shows that judges are interpreting this with reference to "in the course of trade" (Reported cases, 1999, 2000). The US boat hull protection uses the phrase "not staple or commonplace". The criterion proposed means that if a product, or a product with a particular feature, cannot be obtained through whatever are the normal channels for its type, investment associated with production to fill that gap will be rewarded by a temporary monopoly of the resulting sales. This will occur even if the novel aspect had been described in technical literature, or even if someone had made a prototype without proceeding to commercial production of it. For DPI, the reward is not for *teaching* how something new might be done, but for actually *doing* it.

This is in basic contrast to patents, since these only purport to reward "teaching". Moreover, their criterion of novelty is whether or not the teaching is new in the whole world. Absurd though it may seem, no patent could now be valid in any country if its "teaching" could be shown to exist already in an obscure technical paper, filed in an Asian library, never translated from its local language, and never even heard of in the country where the application for a patent was being made. Even worse, however, the "teaching" of a patent must also not be "obvious to one skilled in the relevant Art", meaning that a "mosaic" of several earlier documents can still deprive the "teaching" of protection, even if it cannot be found to be "anticipated" in a single publication.

These patent criteria serve the interest of the firms that are at the leading edges of world technology, since only these will have economically relevant

"teachings" that cannot be shown to be anticipated or "obvious" from the scientific literature. Such firms just do not tend to originate in countries like Ireland. Similarly, the incremental innovations that make money are those that evolve organically out of existing technology and in turn point to the next small adaptive change. As such, they will be "obvious to one skilled in the Art" and consequently unpatentable. This reflects abdication of protection for genuine incremental innovation by the patent system, leaving it to be dealt with instead by the capability market power possessed by large and established firms.

Instead, DPI would make the subject-matter of protection, not information in the abstract, but the *investment* which is needed to turn that information into concrete reality. A state-guaranteed privilege is being exchanged for something the state wants to encourage, which is investment under uncertainty and high risk. The exclusive privilege is being granted, not for *finding* new things, but for getting them *done*. Just as the objective in the case of the Orphan Drug legislation was to make it attractive to invest in producing new drugs of special kinds, so Irish introduction of DPI would have the objective of making it attractive to invest in the widest possible range of new developments that cannot rely for protection on patents as these currently exist.

3.2 *Geographical Range*

The novelty criterion of "not available in the ordinary course of trade" must of course be defined in relation to some geographical area. An Irish government can only legislate for the Republic, where the market is likely to be too small to provide a launching pad for significant innovations. But because of the happy coincidence that a form of DPI already exists in the UK through its 1988 legislation, any investment made under DPI in Ireland could also count on being immediately protected in the much larger market of the UK. As noted earlier, British functional design protection is a form of DPI, and its novelty criterion is being interpreted by the courts in very much the same way as that proposed for DPI in Ireland.

From the Irish point of view, what is important is that this British protection could be an automatic extension of a DPI regime in Ireland. It would even protect ideas which originated outside either country, but which were being innovated in Ireland under DPI, because of a provision in the British law that where a new design has been made abroad, the right belongs to whoever first markets it (or the product which incorporates it) in the EU.

The obvious geographical criterion for an Irish DPI system, therefore, to take advantage of the existence of this existing parallel protection in the UK, would be "… not available in the ordinary course of trade within Ireland or the

United Kingdom". Since there are no registration provisions for the British protection, if a design were to be contested in the courts there, it would be necessary to be able to prove its existence on a particular date. The application for DPI in Ireland would suffice for this. If DPI was seen to be a success in Ireland, it could be expected to be imitated by other countries, and as reciprocal recognition of arrangements for DPI was built up, the geographical limits could be expanded in the same way as they were to the UK initially. The Paris Convention had been preceded by a large number of such bilateral agreements.

3.3 *Irrevocable Grant*

An essential element of DPI is to give investors as much certainty as possible about the projects they are considering. With anything new, an investor faces the uncertainty as to "whether it can be done", and even when that is overcome, there remains the risk that the product will not succeed commercially. Many reasons for this will only become apparent with hindsight. The very last thing a potential investor wants as well is the danger that he will have to get involved in costly litigation to preserve the conditions under which he thought he was making his investment. At present, this is not at all unlikely, because apart altogether from infringement, a patent grant can be effectively extinguished by the later discovery of information whose existence at the time of grant had been unknown to any of the parties concerned. Who would undertake speculative drilling for oil on the basis of a legal concession which could be revoked if new seismic information became available about the geological structure to which it relates? Yet this is what is effectively being asked of whoever makes an investment on the basis of patent protection.

DPI, in contrast, would offer one opportunity before grant to competitors and the public at large to provide evidence to contradict an applicant's claim that his proposed innovation meets the novelty criterion. After preliminary screening, a description of a project would be published on a website, so that any member of the public can submit evidence before the application is formally investigated. Once made, however, a grant would be irrevocable (unless it has been obtained through fraud) and as such must be a vastly more attractive basis for investment in innovation than a patent can offer.

3.4 *Settlement of Disputes*

Because patent owners have to protect their grants themselves through the legal system, these grants are effectively no more than licences to litigate, and the value of such a licence depends upon the size of its owner's purse. Not alone can a small firm's valid patent be infringed with impunity, simply because it cannot afford to pursue a wealthy opponent through the courts;

large firms get *de facto* protection from patents that would be found to be invalid if they were tested legally, just because no one can afford to challenge them. Consequently, the state should be involved in policing the privileges it grants. This is not only for the sake of justice, but because infringement of a grant which has been made for a public purpose (in this case, national industrial development) is also an attack upon the state's own social policy; there is an element of lèse-majesté about it.

DPI would change this situation by making expert arbitration of disputes compulsory, with arbitrators selected ad hoc from the business, scientific and academic communities for their knowledge of the state of the relevant art. There would of course be appeal to the courts from arbitration, but legal aid would then be available to the party who accepted the arbitrator's decision. This is not a support to any particular size of firm. But in practice no small firm would appeal, because to do so would shift the dispute on to ground where its stronger opponent could use its financial advantage. Large firms would be reluctant to appeal, as a result of the combination of having lost an expert arbitration (because judges give much credence to technical expertise) and of facing an opponent who will now have equal resources for litigation. As a result, legal aid should be called for rarely.

Evidence for this view is obtainable from a recent valuable initiative of the UK Intellectual Property Office in its "Opinions". For only £200 it is possible to obtain the expert view of a senior patent examiner on the validity of a patent or an infringement claim. Although these do not bind in law, they are already likely to have reduced intimidation of smaller firms by large ones. Firms now have to be cautious about using their strength in litigation against an opponent who has obtained a favourable Opinion, because this will weigh heavily with a judge. For examples, see http://www.ipo.gov.uk/types/patent/p-dispute/p-opinion/p-opinion-advert.htm

3.5 *Infringement*

DPI would use a "whole information contents" approach to deciding questions of infringement. Its grant would cover *all* information contained in a new product, even what is known as "tacit" information (what we know but cannot easily express) as well as information which only emerges with hindsight. This stress reflects the difficulty of understanding the full significance of anything new *as long as it is new*. As to the feasibility of this approach, it is noteworthy that business people seem to be able to pick out new things to copy very quickly once they sense a favourable response from the market. For DPI, therefore, infringement would be defined as "… causing or attempting to cause, loss of revenue to the protected product, other than by innovation which uses none of the information in whatever is protected". This

would explicitly include "that it can be done", or "that there is a market for it", since competitors would not have these highly valuable pieces of information if the investment under DPI had not been made. Patents do not protect these types of information, with the result that others can free-ride with impunity on the investments and efforts of those who originate them.

3.6 *Term of Protection*

Patents are now granted for 20 years from application. The term of DPI grants could be expected to be shorter, in line with their incontestability, and this should make the strength of the resulting protection readily acceptable to public opinion. The TRIPS Annex to the World Trade Organisation agreement specifies that protection for industrial designs in member-countries must last for at least ten years. The UK functional design protection protects for this term without qualification, but adds a further five years when the protection is subject to compulsory licensing.

Basic DPI terms could be adjustable according to the risk undertaken in making an investment, or in order to encourage investment in designated regions (e.g. of high unemployment) or specific technologies. One possibility discussed in the EU book is to have three terms, the longest for radical innovations, the shortest for incremental innovations, and one intermediate between them. Measurement by money instead of time, as has been suggested for patents, might also be adapted to DPI. The principle on which the length of the protection term should be decided is that any investor would much prefer a short term during which his protection was certain, to a longer term which could be contested.

3.7 *"First Mover" Advantage*

The first country to introduce DPI generally would gain a significant benefit. In the Irish case, this would build upon the country's own very positive experience with this type of protection for new plant varieties. The new protection that would be granted relates explicitly to investment, its length could be tailored if desired to its risk, and because it specifically relates to innovation it has a good chance of resulting in industries with the power of future growth.

Further, it would ensure an increase in the amount of R&D carried out with wholly commercial objectives. It would direct resources towards those who can use them best in innovation. It would particularly stimulate innovation of products and components of products that patents fail to protect, such as incremental improvements. These are areas in which Irish businesses could hope to be profitably involved, if DPI was available to provide the protection which investment under uncertainty needs. And, as noted earlier,

losses would be borne by those who hoped to gain from their investments, not by the taxpayer – DPI involves no subsidy.

3.8 *Not a Return to Protectionism*

In the Irish context, a reasonable question is whether this proposal is not for a return to the protectionism which was the state's first industrial policy, and which failed? The answer is that the failure of the earlier policy was precisely because of *lack* of innovation by the firms which were established under it. In contrast, what is now proposed has no objective other than to enable firms to innovate.

The primary reason why protection of infant industries failed in Ireland, having succeeded in Germany and the US, was the size of the national market. This was so small in the Irish case, that to be viable at all, any local manufacturer had to have the entire market – all the firms established under the Control of Manufactures Acts were monopolies. Because of this, they did not have the stimulus to innovate that competition provided within the big countries. Second, no attempt was made to provide the owners and managers of these firms, and other potential investors, with property laws which would encourage them to become involved in innovation. In contrast, any firms which would come into being under the arrangements now proposed, would have to be innovative from the start, and founded by innovators. DPI would contribute to the growth of this group of dynamic firms automatically, effectively and at virtually no cost to public finances.

3.9 *Exploiting the World's Unused Inventions*

DPI could also bring about innovation of inventions whose details are to be found in the databases of the world's patent offices, but which were ahead of their time. If a patent is obtained before the market for an invention has developed, it actually *prevents* protection being obtained later on, when conditions have changed, the market is ready for the invention and protection is then needed to encourage investment in it. This is because the publication of the earlier patent application makes the information into "prior art" to defeat any future patent application. Alternative energy inventions patented when fossil fuels were cheap are needed now, but cannot get the protection they need to make them investment opportunities. For example, the Canadian National Research Corporation invented a new kind of wind turbine, but was denied a patent for it because one had been granted decades earlier (Darrieus, 1931). At that time, oil was cheap and there was no thought of global warming, so the earlier invention was never used.

This lack of specific market power means that if investment in such innovations is to be made at all, it can only be through the capability market

power of larger firms, with all the drawbacks of this, including their known inertia with respect to innovation. DPI, however, could provide it for smaller firms because it gives protection for something not *done* before, instead of for something not *known* before. The databases of the world's Patent Offices probably contain large numbers of inventions of this kind. The Japanese automobile industry made very effective use of this source of information in the early stages of its development, and DPI could similarly lead to the building of new businesses on information in these databases that is commercially sterilised at present.

3.10 *Providing Opportunities for Venture Capital*

Apart from unused inventions, there are also ideas that could be innovated if their promoters could only find the backing they need to get started. That backing is more likely to be found if investors could foresee that they would have a useful period during which the idea in question could not be copied in Ireland and the UK. Only DPI could provide such reassurance. Venture capitalists are subsidised at present both by the EU and Ireland, but they have difficulty finding projects that can meet their requirements, DPI should increase the number of these. To the extent that this led to manufacturing, it is inevitable that there would progressively be incremental improvements in whatever was being made. Ability to protect these would consequently improve the return on the original investment.

3.11 *Open to Foreign Investors*

As with patents under the Paris Convention, a DPI grant would be equally available to foreigner and native. However, whereas a Japanese firm, for example, can obtain an Irish patent and enjoy its protection here by means of imports from Japan, it could only get the benefit of DPI by actual investment to produce its innovations in Ireland (as was actually the case with patent protection under the Paris Convention until 1925). This involves no discrimination against the Japanese firm, since DPI imposes an identical obligation on Irish investors. DPI would be particularly attractive to firms which already have establishments in other countries, especially sales offices, because of the speed with which they could exploit the results.

IV DIRECT PROTECTION OF INNOVATION, TRIPS AND THE EU

Before introducing the necessary legislation for a DPI regime, confirmation would be needed that it is compatible with both the TRIPS Annex to the 1994 World Trade Organisation agreement and EU prescriptions. It

would not be governed by TRIPS because its method of protecting investment in innovation is not specified in that Annex nor would it modify or interfere with existing patent or design arrangements in the slightest way.

The first hurdle to be cleared with the EU would be to ensure that it did not amount to an unfair distortion of trade patterns within the Union, but an objection to it on this score seems unlikely. However, Brussels might claim a further interest in view of Article 118 of the Lisbon Treaty. This empowered it "… to set up centralised Union-wide authorisation, co-ordination and supervision arrangements to provide uniform intellectual property rights throughout the Union". The term "intellectual property" is to be interpreted restrictively, as is the case with all treaty language. This portmanteau phrase only came into use in recent decades as a convenient means of grouping patents, trademarks, copyright and industrial designs together. It has no further meaning. The Paris Convention is for "industrial", not "intellectual" property. This semantic issue would only be important if the European Court of Justice had to rule on a claim by the Commission that the wording of the Lisbon Treaty covered all possible means of information protection. The same argument would be made to the EU as to the WTO, i.e. that DPI is fundamentally different to and distinguishable from patent protection.

4.1 *EU's Pressing Need for Innovation*

A proposal to establish DPI might even be met with enthusiasm, since the EU is desperate for a return from financial to technological innovation, as its only hope for economic growth and employment. The Union's own innovation policies have been a notable failure. For example, at its Lisbon meeting in 2000, the Council of Ministers resolved that within a decade Europe "… would be the leading power in the world in the knowledge economy". Not alone was it clear within a few years that this goal had not the remotest chance of being achieved, but by the best measure of smaller firms' inventions in existence, Taiwan on its own has now surpassed all *27 EU countries combined* (for the figures, see Kingston and Scally, 2006). According to the EU's own measure, "China is fast catching up" and "South Korea is increasingly outperforming the EU 27" (EU Innovation Scorecard, 2012). An important focus of the Commission in relation to information protection has been to try to achieve a single patent for the whole of the Union, but even if this were to be successful, its main effect would only be on chemical industries. All other industries need DPI if they are to become significantly more innovative.

For these reasons, EU policymakers might well be keen to encourage an initiative in Ireland which could be adopted by other member countries if it proves to be successful. They cannot afford to ignore any possibility of economic innovation, and if DPI worked well for Ireland it could be extended

quickly and easily. The EU authorities themselves used DPI for their database Directive, and the great success of both plant variety protection internationally and the US Orphan Drug Act in also applying the same principle, must encourage them to approve a trial in Ireland in the way now proposed. The same authorities also spent several years of time and effort trying to develop a "Utility Model" Directive to protect inventions which cannot meet the standards required to get a patent. Some countries, such as Germany and Japan, already have a form of this in what they call "petty patents". However, this project was abandoned because of the difficulty of obtaining agreement between member-countries. DPI gives all the protection that was then being sought after, and more.

V TRYING TO GET SOME VALUE FROM PATENTS

5.1 *Commercialisation of University Research*

Until 1981 in the United States, any patents obtained as a result of public funding remained the property of the government. From that year, Universities were allowed to own them, and shortly afterwards, the Cohen-Boyer gene-splicing patent became an extremely lucrative source of funding for Stanford University. Universities everywhere thought that they, too, could become rich by setting up Technology Transfer Offices (TTOs) to patent their academic research. In fact, few of these have ever covered their costs. Even the President of Harvard had to admit that "… the odds against making anything substantial from a new discovery are extremely small." (Bok, 2003, p. 77).

In Ireland, the government was persuaded to spend very large sums on University research through bodies such as Science Foundation Ireland (SFI) on the basis of the naïve linear view of innovation, that money spent on basic science will lead to applied science and then to high-tech businesses and ultimately, jobs. But the 2009 Special Group on Public Service Numbers and Expenditure Programmes called attention to "… the substantial amounts (nearly €1.5 billion) invested to date" and "… the lack of verifiable economic benefits resulting from these investments" (Section D7). It was also concerned that it took 200 employees and €16 million a year in the seven Universities just to administer their research funding (Section D5).

As a result, the government has shifted SFI's brief definitively from basic to applied research, and established a Central Technological Transfer Office (CTTO) to administer a new National Intellectual Property Protocol. The objective of this body is "… to improve economic return from State investment in research by encouraging the commercialisation of all forms

of intellectual property arising from research in the publicly funded research sector" (*Putting public research to work for Ireland,* 2012). Responding to these initiatives, the Dublin Institute of Technology became the first institution to abandon the practice of claiming rights to inventions made by its academics.

However justified this change of emphasis for public funding of research is, there are two dangers in it. First, TTOs under threat may be more vulnerable to "trolls", firms which use patents resulting from University research, not for innovation or manufacture, but to blackmail firms with threats of vexatious litigation. The "trolls" present themselves as venture capitalists to the TTOs and so provide a semblance of commercialisation to their work. This misuse of the patent system caused the main Research Universities in the US to issue guidelines "… requiring their licensees to operate under a business model that encourages commercialisation and does not rely primarily on threats of infringement litigation to generate revenue" (Stanford University, 2007). The Irish government has countenanced an initiative to try to establish a hub for the international trading of intellectual property on the model of the Financial Services Centre (see Deloitte contract, 2011). This would in fact facilitate the trolls.

Second, SFI funding could become another largely opaque subsidy to multinational corporations, akin to that given to pharmaceutical firms through the high prices their products have been allowed to command in Ireland. Claims from multinationals that their research will lead to jobs will inevitably be more convincing than similar claims from indigenous firms. A partial solution could be to follow the example of the outstandingly successful Small Business Innovation Research (SBIR) programmes of the United States. These allow firms to spend up to half of their awards on "consultancy," which generally means University research. This keeps the focus on commercialisation of such research at a level that cannot be matched by academics on their own.

The inadequacies of patents as an instrument for the CTTO to achieve its objective have been discussed above. However, there is one simple change that could improve its chances, which is to set up arrangements to enable Irish owners of United States patents use "contingency fee" litigation there to protect them. If projects emerge out of research in Ireland that have a global potential, patent protection in the United States would be essential for their commercialisation. But without the support for litigation now proposed, any such patents that do find licensees will earn much less than their true value, since no Irish firm or University could contemplate the cost of defending them in the US courts, as potential licensors will know well.

5.2 *"Contingency Fee" Litigation in the United States*

The patent system purports to grant a privilege in the form of a property right, but this is not like other such rights, which are protected by the police power of the state. Instead, patentees have to defend their own grants by civil actions in the courts. This is intrinsically expensive, and gives the advantage to whoever has most money. As discussed earlier, there is no shortage of evidence of the readiness of many large firms to intimidate patentees who want to sue for their rights, with implicit threats of imposing legal costs on them that they cannot possibly bear. This has been summed up by the former Manager of Technology, Strategy and Planning of IBM research, as "… Large companies routinely infringe intellectual property of start-ups or individual inventors. They will not sign non-disclosure agreements to protect others' IP. When shown relevant patents they need to license, they literally say 'Sue us', knowing that deeper pockets trump a valid claim" (Shapiro, 2012).

In research for the EU directed by this author, every single United States patent owned by a small- or medium-sized European business which appeared to have potential economic value, was found to have been infringed (European Commission Report. 2001). Because of the extremely high cost of litigation in the US, where cases regularly cost millions of dollars, the risk of challenging these infringers could only be taken very rarely, so the prudent course is to accept defeat at the hands of the infringers. This makes the patent document effectively worthless, which is particularly damaging to innovation in countries other than the United States because any invention of significance cannot do without protection there. The German Insurance Federation studied the possibility of patent insurance but concluded that this could not be provided economically in a situation where only the patents most likely to give rise to a claim would be insured (ibid., p. 73). The Commission then spent a considerable sum investigating whether anything could be done about this, but concluded that it could not (see http://ec.europa.eu/internalmarket/indprop/patent/index en.htm#studies)

There is however a mitigating feature in US legal procedure, not available elsewhere, which is litigation with "contingency fees". Although US judges have power to award costs to one party, this rarely happens. The normal procedure is that each side pays its own costs, win or lose. On a contingency fee basis, a client does not have any liability to pay his own lawyers, but if he wins, these are entitled to receive a large share of whatever damages are awarded. 40 per cent is typical for this and a 50-50 split is not uncommon, especially if there is an appeal. Some competent legal practices specialise in this kind of work. As well as this, US courts can and do award triple damages for deliberate infringement. Because of such provisions, a patentee who lacks money but who has a good case can get it argued in US courts.

Nevertheless, another obstacle remains, and it is serious enough to prevent Irish patentees from taking advantage of the contingency fee system. Although in such cases the US legal firm is investing the time and expertise of its staff at its own risk, and the prospect of a very large payoff is a strong motivating factor for them, its client still has to pay all related costs, such as for discovery of documents, expert witnesses, court charges and the like. Infringers are very skilful at pushing such charges up, as a way of intimidating opponents. Even though these costs are small in relation to those of the lawyers, they would be more than enough to deter any Irish firm or university even if it was able to find a law firm to take its case on a contingency fee basis.

To deal with this, the CTTO could fund these incidental costs where an indigenous firm is involved and has found a law firm in the US that is willing to take its patent case on a contingency fee basis. This funding would not be a grant, but a loan, repayable *only* out of damages obtained through the litigation. That is, there would be no liability to the government on the part of the patentee if the case was lost.

Such an approach is interventionist, but it is of the benign type because there need be no discretionary element in decisions as to whether a loan should be granted or not. Those responsible for administering the scheme would not have to weigh up the chances of winning a case. This is because no law firm will take one on a contingency payment basis unless it considers that it has a good chance of making money out of it. No evaluation of the likelihood of a successful outcome could be better than that of the US law firm which would be making its own very large investment in it. Since the relevant costs would all be court-related, they would be easy to audit. For even greater ease of administration, an approved list of contingency fee lawyers might be established, but once one of these confirmed that it was willing to take a case, provision of the loan for incidental expenses should be automatic.

5.3 *A Valuable Deterrent*

The very existence of such a scheme would in fact be a powerful deterrent to intimidation by US infringers, so that the number of cases where it would actually be necessary to call on public funds would likely be few. The number where these funds would not be repaid from damages won should be even fewer. It is one thing for large firms to bully smaller ones (especially if they are foreign) with threats of causing them heavy legal costs, if it can be assumed that they do not have the resources to resist. It is an entirely different matter if there is support from a competent law firm, motivated to invest its own time and expertise in the case, together with some public loan funding, to make the playing field level. In that case, the prudent course for the large firm is to license the patent instead of infringing it.

What is proposed would therefore improve the economic environment for genuine research and development. It would also increase the potential for joint research projects between Irish and foreign firms and Universities, because the availability of loans for litigation incidentals would apply to whatever came out of their mutual efforts, and the non-Irish partner could not get this support at home.

The recent case of Allvoice Computing of the UK illustrates the potential of such an approach. This small firm's patents were infringed in the US, but it was able to find lawyers to take its case on a contingency fee basis. After thirteen years of obstruction, to which the US Appeal Court finally put an end, Allvoice won a settlement before trial. The incidental costs forced on it by its opponents over this period ran close to seven figures in US dollars. The amount of the settlement obtained has not been disclosed, but its scale can be inferred from the fact that its Managing Director, John Mitchell, has testified to a British Government enquiry that because of it his tiny firm had paid more tax than Microsoft in the UK in 2009. He and other small high-tech business owners have since founded SMEIA (Small and Medium-sized Business Innovation Alliance) which is working to get better legal protection there for innovatory firms.

5.4 *Putting these Proposals into Effect*

When the European Commission decided to investigate DPI, a start was made through an international Expert Conference in Luxembourg to discuss it. If its introduction in Ireland was considered to be worth examining, it might be useful to hold a similar Conference in Dublin, which of course would now have much more information to consider. Contributions to it could come from sources such as the European Commission, the Secretariats of TRIPS, the World Intellectual Property Organisation and UPOV; the authorities in the US, the EU, Japan and Australia which apply DPI in their Orphan Drug schemes; and lawyers and others in the UK and US with experience in the working of DPI in the functional design and boat hull protection arrangements in those countries.

The suggested improvement in patent protection could be introduced immediately, by making a small sum available to lend to applicants who find a law firm in the United States to take their patent case on a contingency basis, to cover their incidental costs. Subsequent funding would be expected to come from replacement of less effective components in existing industrial promotion budgets. Such little administration as the scheme needs would add only minimally to the tasks of the CTTO, and the IDA's Officers in the US are well placed to evaluate legal firms for an approved list. The valuable experience of SMEIA in US patent litigation could be called upon if required.

VI CONCLUSION

When it became clear in the 1950s that infant industry protection was not working, policy changed to the attraction of inward manufacturing investment. This policy now has an uncertain future. Not alone is it becoming more difficult to attract new investments, it is also harder even to keep those that are already here. The US is taking steps to keep more manufacturing at home and to rein in the use of offshore tax havens by its firms; drugs that are a mainstay of Irish manufacture for export are at, or nearing the end of, their patent protection; and the EU has active proposals for corporate tax reform. DPI and arrangements for contingency fee litigation in the United States are indications of the radical policy changes needed at what is surely a new inflection point.

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