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RESEARCH NOTE

Innovation after Brexit

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ABSTRACT

Brexit is intended to return autonomy for law-making to the UK Parliament, and this opportunity could be used to improve intellectual property laws. These were originally drafted to support innovation, but like other laws of property they were captured by interests. The result is that their original function has been far surpassed in economic importance by their use for moving corporate profits to and through tax havens for tax evasion and avoidance. Although an opportunity to improve information protection laws may indeed result, Britain has never been a leader in drafting these, compared with Germany and the United States. Also, to the extent that better laws could refocus investment on technological innovation, and away from financial innovation, it could be expected that they would be opposed by interests with a major stronghold in the City of London. Reference is made to specific proposals for change already advanced in Prometheus, to which is added a new suggestion about how more generous overhead payments from public funding of innovation could help to stimulate more firms to bid for this. Also, a proposal is made for a means of rectifying a series of legal decisions which have had the effect of denying firms the ability to benefit from new ideas offered by outsiders.

Introduction

A strand in the case made for Brexit was that Britain's economic progress could be faster outside the constraints imposed by membership of the European Union. This carries implications for intellectual property, since that progress depends upon innovation, some of which, in turn, depends upon express legal protection of information. It is certainly true that the existing pattern of intellectual property laws does not work well for innovation and actually distorts it, but the blame for this cannot be laid at the door of the EU. The Paris Convention, which makes patents and trademarks international, and the Berne Convention, which does the same for copyright, had Britain as a founder member from 1883 and 1886 respectively. The 1961 UPOV Convention, which protects new plant varieties, the Patent Cooperation Treaty of 1970 and the European Patent Convention of 1977, which led to the European Patent Office, are all independent of the EU, and the TRIPs intellectual property Annex to the World Trade Organization Agreement of 1994 takes precedence over them. Only EU design protection appears to be an issue, and that not of the highest importance.

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No change in intellectual property

Consequently, in terms of intellectual property, the UK's position pre- and post-Brexit is substantially unchanged, but that level of protection of information for innovation is not particularly effective. Moreover, the use of freedom from EU constraints to make trade agreements directly with other countries carries dangers that this low level will either be continued or made even worse. This is particularly the case in dealing with the US. Before the World Trade Organization was established in 1994, the US Trade Representative (USTR) was part of the State Department (its Foreign Office). In policy related to business, this had to take account of many other factors in its decisions, such as the country's military alliances, or even how foreigners view America.

An important objective of the US business interests which shaped the TRIPs Annex to the World Trade Organization Agreement was to extract the USTR from the State Department. They were successful in this, so that from 1995 this body has been free to act as an instrument of these interests abroad in an unconstrained way (Sell, 2003, p.92). As these firms have been leaders in the use of intellectual property as a means of tax avoidance and evasion on their profits made outside the United States, the USTR may well strike a hard bargain in respect of this activity on their behalf. They might well look for patents for software, for example, on which they were resoundingly defeated by the European Parliament.

The UK is effectively bound into the existing intellectual property arrangements of the world by its membership of the World Trade Organization, with its TRIPs Annex, and it is certainly not going to leave this. On the other hand, since Brexit is supposed to deliver freedom to the country to make laws in its own interest, it would seem to offer an opportunity to apply this freedom to fill some gaps in present arrangements for protecting information, so that this can underwrite a revival of innovation in manufactures.

Tax avoidance and evasion

The industrial revolution depended upon a system of individual property rights which was unusually capable of forcing self-interest to serve the public good as well. This system led to unprecedented growth of wealth, not least because it encouraged technological innovation. Over time, however, the laws of property were captured by those who could benefit from them (Kingston, 2017) and there could be no more striking illustration of this than what happened to intellectual property. The laws grouped under this heading were originally devised to facilitate innovation, but this function now scarcely compares in economic terms with their use to move money through tax havens for tax avoidance and evasion. For example, recent authoritative data for Apple Computers have shown it to have paid tax at a rate of only 0.005% on billions of dollars of profits on sales made in many countries. This was achieved by subsidiaries in tax havens charging royalties on intellectual property to counterparts in countries where products are sold. This shifts local profits to low- or zero-tax countries (European Commission, 2016).

Such activities by large numbers of multinational corporations represent a massive transfer of the revenue governments need to spend on their social welfare, health and other services, to the owners of corporations. This is what globalization means, and the enormous growth of distrust of the representative democracy which has been complicit in it is the highly visible reaction. Instead of looking after jobs and people at home, politicians are

seen to have opted for globalization in exchange for campaign and personal funding from firms and rich individuals.

False trade theory

Politicians and their civil servants have also been influenced by the failure of economists to upgrade the teaching of a founder of international trade theory, David Ricardo. All but a few have remained content with his simple two-country model which showed that both countries will be better off if each of them specializes in producing the goods in which it has a comparative advantage and trades for the others (Ricardo, 1971 [1817]). But Ricardo could not have envisaged a world in which capital, as well as goods, could move, as it can with the utmost ease for the modern corporation. The mutual benefit outcome no longer holds if capital is mobile. For example, a US firm invests in Mexico to take advantage of lower wage rates there to produce cars. Mexico benefits from the employment, and the US may benefit from cheaper cars. But the US loses the employment and the profits all belong to the US firm, which will use transfer pricing – probably involving intellectual property – to ensure that little or no tax is paid in either country. The balance of advantage is wholly with those who provide the capital, and this has led to what has been called the 'fundamental trilemma' of the world economy, as described by Rodrik (2011, p.xviii):

> We cannot simultaneously pursue democracy, national determination and economic globalization. If we want to push globalization further, we have to give up either the nation state or democratic politics. If we want to maintain and deepen democracy, we have to choose between the nation state and international economic integration. And if we want to keep the nation state and self-determination, we have to choose between deepening democracy and deepening globalization. Our troubles have their roots in our reluctance to face up to these ineluctable choices.

Brexit reflects such a choice in favour of 'keeping the nation state and self-determination', which means turning away from globalization. This could offer an opportunity to bring in new laws to improve protection of information. Such laws could transform the environment for national innovation.

Brexit may not help innovation

However, there are two obstacles to achieving such an outcome. The first of these is that the change in the primary function of intellectual property laws was an aspect of a general replacement of technological innovation by financial innovation. The City of London was in the vanguard of this, which is why finance so largely replaced manufacturing in the country's economic activity. The powerful interests concerned are unlikely to welcome the moves which are necessary to restore the primacy of technology (Kingston, 2015).

The second obstacle arises from the historical reality that Britain has never led in developing laws which protect information. It is in fact the only country where there has actually been an active *anti-patent* movement (Machlup and Penrose, 1950). As the first mover in the industrial revolution, British firms built up substantial capability market power through their investments in productive facilities. Naturally, they did not want to see rivals emerging with legal protection of new ideas. The great railway and steamship engineer, Isambard Kingdom Brunel, for example, testified to a Parliamentary Committee that patents 'impeded his work at every hand's turn' (House of Lords, 1851).

As a follower country, Germany did not have similar built-in opposition to patents and passed an act to grant these in 1877, which was of enormous importance for the country's economic development. Britain did not give itself a patent act to match the German one until 1905, by which time it was far too late.

Accepting American leadership

Passivity was also evident when Britain, in common with so many other countries, copied the United States Patent Act of 1952. As the criterion of novelty, the requirement for an 'inventive step' in the European patent rules, for example, is the same as that for 'non-obviousness' in the US system. In any event, the United States is not a good model for intellectual property, because it is rare in having patents and copyright prescribed in its actual constitution and not just by statute. This constraint makes it difficult for the relevant laws there to respond to changing conditions, as when software, which needs a quite new kind of protection of its own, had to be shoehorned into existing copyright and patent arrangements. Other countries, which are not so constrained, consequently had an opportunity to develop better laws for information protection and financing, which are key to economic innovation.

They failed to exploit this opportunity, probably because the obvious technological superiority of the United States after the Second World War was mistakenly considered to be associated with how it protected information. The one exception was Japan, which made no fewer than 18 changes to its patent law in a few decades, significantly contributing to its altogether unforeseen rise in technological capability. All of these changes were designed to facilitate the incremental innovations on which this rise was based, and it was only when Japanese firms reached the limit of growth from these that Japan finally introduced a patent law which purported to offer protection to radical inventions.

WIPO and TRIPs

A factor in this general failure to develop indigenous intellectual property laws must surely have been the dynamism of Arpad Bogsch, who built the Secretariat of the Paris and Berne Conventions into the World Intellectual Property Organization (WIPO). This became an active promoter of worldwide intellectual property 'harmonization' with laws which were effectively those of the United States.

That 1952 US Patent Act was a particularly bad exemplar for the rest of the world because it had been written by lawyers for the pharmaceutical industry. It should be no surprise, therefore, that worldwide adoption of its provisions has led to most of the profits attributable to patents throughout the world being made by chemical firms. The research of Bessen and Meurer, for example, showed that for the period 1994–1999, annual profits from associated world-wide patents for US pharmaceutical firms were about $13 billion at 1992 values, compared with only $3 billion for firms in all other industries. Further, the costs of keeping that protection (as reflected in litigation costs) were roughly in the reverse proportion (Bessen and Meurer, 2008, p.139).

Neither did other countries, including Britain, show any opposition to the Trade-Related Intellectual Property (TRIPS) Annex to the Agreement, which set up the World Trade Organization in 1994. In discussing how this Annex was the handiwork of the Committee on Intellectual Property made up of US multinational firms, Susan Sell, the historian of this

Agreement, has written that 'Twelve corporations made public law for the world' (Sell, 2003, p.72). Most of these firms were important users of patents, but tobacco industry influence is evident all over the trademark provisions of TRIPs.

Functional design protection

In defence of British failure to originate laws for protecting information, it might be pointed out that, uniquely, the country has functional design protection in its 1988 Copyright Act. However, this is not the result of coherent policy-making, but a change in the law made necessary by the 1976 Armstrong patents case, which ended with the House of Lords ruling that to copy a three-dimensional object is to infringe the copyright in the drawing from which it was made. This gave an absurdly long period of protection (lifetime of the draughtsman plus 50 years) to a huge range of artefacts with little or no innovative content, and this had to be repaired by statute.

Patent Office initiatives

In contrast to the inertia of the legislature, at the procedural level the UK Patent Office has made several useful changes. In particular, it has introduced an 'opinions' service, which allows the validity of any patent to be evaluated by an experienced examiner for a nominal fee (UK Patent Office, n.d.). This is unquestionably of great value, as it includes dealing with actual or potential infringement. The high quality of these reviews is probably already preventing much intimidation of patentees whose resources for litigation are limited.

However, fundamental improvement can come only through changes in the law, and these should echo the Venetian patent ordinance of 1474, basically that Venice already had a great many ingenious individuals, but would have many more were it to offer them legal protection for their ideas. Since technologies other than chemical are making little money from patents, the big opportunity is to develop laws that will provide effective information protection to these. Some practical suggestions have already been discussed in *Prometheus* (Kingston, 2015). In summary, these are as shown below.

Reducing the cost of dispute resolution

This could be easily done by making expert technical arbitration compulsory, with legal aid for the respondent party in the event of an appeal to the courts. In fact, all it would mean in Britain is making the Patent Office's existing opinions procedure binding on the parties, and adding the legal aid component.

Money instead of time as measurement of awards

Measurement of the protection granted for information is in terms of a monopoly of its use for a limited time, which is extremely crude. Only by sheer chance could such a measure correspond to the incentive that is needed to invest under uncertainty and risk in producing information. Moreover, there is no necessary connection between the time the monopoly lasts and the money it produces. Of course, when patents were first introduced, there could have been no other measure than time, but the growth in sophistication of accounting

measures since then now allows the use of money for this purpose. This is the only appropriate measure, and one way in which it could replace time is by basing protection on how much it has cost a firm to produce the information. Other firms which then wanted to use the information could pay prescribed *multiples* of that figure, depending upon how early they apply in the process of risk reduction which takes place through turning the information into concrete reality, that is, its innovation. This is *retrospective* sharing of the uncertainty and high risk associated with an investment which leads to useful information, with latecomers paying a premium because they had not invested originally or earlier. An additional advantage of such a change is that it would allow significant inventions to be quickly developed along different trajectories. This is inhibited by the existing combination of monopoly and time as the measure of an intellectual property grant.

Protecting innovation directly

Because a patent system protects only invention, whatever protection the innovation of an invention receives from a patent is indirect, and depends upon the strength of the link between them. In the case of chemical inventions, the link is very strong, but in other technologies it is weak. Between a mechanical invention and its eventual commercial embodiment there will often be so many incremental changes as to make one virtually unrecognizable from the other. Non-chemical innovations therefore need to be protected *directly,* and Britain already has the statute for this in embryonic form in its functional design protection.

A lesson from dyestuffs

Putting any of these measures into effect could contribute significantly to economic innovation in Britain, and implementing all three of them could transform the climate for it within a very short time. The result, in fact, could mimic the outcome of the German 1877 patent act, referred to above. There is a particularly important lesson to be learned about the potential value of having appropriate protection of information from the effect of that German act on the history of dyestuffs.

The first artificial dye was discovered in 1856 by W.H. Perkins, a student in what became Imperial College, and his father financed the first factory to produce it in quantity, at Greenford. It could reasonably have been expected that this would lead to a great British industry because the country had both by far the largest textile industry in the world to use such dyes, and an unlimited supply of their raw material, coal tar.

In the event, German chemical firms came to dominate dyestuffs markets throughout the world, as well as the nascent pharmaceutical industry. Salvarsan, the first drug to be effective against syphilis, and Prontosil, which put an end to the scourge of childhood fever, were early products of their dyestuffs research. Without any doubt, they achieved this dominance through their use of patents (Murmann, 2003). This dominance was so great that modern pharmaceutical industries in both the UK and US really started only when German patents in both countries were sequestrated by Controllers of Enemy Property when the 1914 war began.

Bearing in mind that the existing patent system clearly offers such poor protection for the generation of new ideas and information in all technologies other than chemicals,

filling this gap in information protection clearly offers great potential for encouraging the indigenous industrial development that post-Brexit Britain will need.

Financing innovation – overhead payments

Industrial development in Britain could be greatly helped by better means of financing research intended to lead to innovation, so much of which now comes from public sources and favours university projects over those of firms. One reason for this imbalance is that the time scale of the projects funded is much longer for universities. Consequently, the likelihood of attribution of blame for failure to those who recommend awards is less. But this timescale will not produce the innovations for which there is urgent need, and the empirical evidence is that funding science tends to produce only more science. For innovations, the focus needs to shift to firms, obviously with generous provision for them to subcontract research to universities to solve problems beyond their own resources.

Firms are much less active in pursuing research funding than universities, which is understandable in terms of how owners and managers respond to ideas that might eventually lead to a new product for their business. It is not enough for there to be a meeting of imaginations between a firm's management and whoever is putting forward such a proposal. Even if this condition is fulfilled, the managers' primary concern is the survival and growth of their firm in the short term. They know that taking up a new idea will inevitably bring with it distraction from their regular work, and they will also be aware that failure is more likely than success. It is not surprising, therefore, that most firms sensibly decide against innovating. If discounted cash flow analysis could be applied to the situation they face, the downside of the distraction would be highly negative because it is immediate, whereas the benefit of the possible payoff is very low through being both uncertain and well into the future.

Public funding could ameliorate the downside of this equation by changing the level of overhead reimbursable to firms in such cases. At present, this can be lower than the rate used by firms themselves, so that they would actually lose money by accepting an award which promised even 100% reimbursement of the research costs. Offering payment of double their own normal overhead to firms would correspond much more to the actual realities of private sector involvement in activities intended to result in technological innovation. However radical it may seem, even *treble* overhead would be no more than realistic in cases where any possible return is both uncertain and a long way in the future. This simple change would be easy to audit and administer, and on its own could greatly increase the number of firms availing themselves of public financial support for innovation.

The supreme importance of the innovative individual

One of the most important insights of the founder of innovation studies, Joseph Schumpeter, was how different are the functions of invention (producing ideas) and innovation (getting new things done):

> And as different as the functions, are the two sociological and psychological types …. The whole history of capitalism would have been different if new ideas had been currently and smoothly adopted, as a matter of course, by all firms to which they were relevant. But they were not. It is in most cases only one man or a few men who see the new possibility and are

> able to cope with the resistances and difficulties which action always meets with outside the ruts of established practice. This accounts for the large gains that success often entails, as well as for the losses and vicissitudes of failure. (Schumpeter, 1947, p.152)

The successes will be rare, but the failures will be many, and the way to even one of the few successes will involve a number of false starts and blind alleys of its own. An innovator begins with a vision of a particular goal, and it is only the strength of this vision that stimulates and supports his repeated attempts to reach it. This also accounts for the early success of capitalism, and its later decline. Because of their particular characteristics, innovators are not easy people to deal with. This does not deter those who use their own money to finance the innovators' projects. However, those who are responsible for someone else's money, including that which comes from public sources, are wary of strong individuals who might make large gains. There is an inherent antipathy between bureaucrats and innovators, and this is why arrangements for encouraging innovation through public funding today lack specific support for the crucial component of it, which is the innovative individual.

It may be argued against this that there is support for 'start-ups'. In fact, the objective of this support may be little more than the removal of people from the unemployment register. Start-up projects are rarely of more than trivial economic importance, and seldom last more than a few years or grow to significant size (Burke and Hanley, 2010).

Spin-offs from existing firms

Much more important in capitalism's dynamic era was the founding of businesses by spin-offs from existing ones. The key agents were individuals who used their experience in one firm to start a new one. Such spin-off firms tended to be located close to the old ones so as to be near suppliers and to draw on an existing trained workforce, resulting in geographical clusters of special technological expertise. Olds Motor Works was the first automobile firm to set up in Detroit. That was in 1901; a mere nine years later, as a result of spin-offs, seven of the 10 largest manufacturers in the US, accounting for two-thirds of all production, were located in that city. Roughly a century later, almost all the entrepreneurs who made Silicon Valley a cluster of comparable importance in information technology, had at one stage worked for a single firm, Fairchild Semiconductor (Klepper, 2010).

These people were Schumpeter's 'one or a few men who saw the new possibility' and could cope with 'the resistances and difficulties which action always meets with outside the ruts of established practice'. The spin-offs they founded had two important advantages: first, the potential of major inventions was realized quickly; and second, the resulting competition delivered the conditions for Schumpeter's 'perennial gale of creative destruction'. This is the process whereby firms which do not innovate continuously are replaced by new ones 'built by new men with new ideas' (Schumpeter, 1994 [1942]), and it has been evident from Boulton and Watt at the outset of the industrial revolution to Kodak more recently.

Large firm inertia

Success in any business inevitably produces forces which work against taking up any major potential change in its technology. There are three reasons: first, such a change would be likely to reduce the value of investments already made; second, as firms grow larger they also tend to become more bureaucratic and consequently risk averse; and

third, because investment in innovation involves uncertainty. These factors encourage management to use available money to expand the existing business either by incremental changes to their own products (which involves little risk), or by buying up other firms in related areas, this being particularly attractive if these other firms are competitors or look as if they could become a threat. Any firm intent on challenging incumbents can rely only upon whatever protection it has for its own new ideas, and whatever support it can obtain for developing them. Consequently, arrangements for both information protection and funding need to be designed to facilitate the foundation of new firms so that these will counterbalance the growth in inertia of established firms, by making them fear competition from the technological advances of young and hungry competitors.

The flow of new ideas between individuals and firms

Spin-offs depend upon the freedom of capable employees to give information and negotiate with those who can provide the support they need to found a new firm. For example, when Ken Olsen's employer, IBM, showed no interest in his proposal that IBM should enter the mini-computer market, he was able to persuade American Research and Development of Boston, the first modern venture capitalist, to finance his start-up of Digital Equipment Corporation.

Progressively, however, the free flow of information upon which such positive developments depend has been eroded by a series of court decisions that make it dangerous for a firm to accept ideas and information from outsiders. Individuals need to have their information accepted in confidence if it is to retain its value to them, but a firm that agrees to do this can find itself with an obligation it did not anticipate. The firm cannot tell beforehand whether the information being offered is actually new to it. If the information is not new, then a confidentiality agreement could mean losing control of an entire area of development already in hand. Some courts have even gone as far as ruling that information has been accepted in confidence, even without any formal agreement.

Awareness of this danger has resulted in an increasing number of firms adopting a policy of blank refusal to accept any information in confidence from an external source. In doing so, they have denied themselves access to new ideas with the result that there is correspondingly less innovation than there might be. The flow of potentially useful information of kinds that are not protected by patents or copyright has been a particular casualty of these legal decisions.

This trend could be reversed by the practice of using a trusted intermediary between firms and those with ideas that could be useful to them. This intermediary could accept ideas in confidence from individuals, and then offer them (without identifying their source) to firms which might want to take them up. Such offers would also be in confidence, but with the proviso that this condition would be waived by the intermediary if the information is not new to the firm. If it was new and the firm then wished to use it, the intermediary would then act as a broker between the parties. In the UK, the Patent Office is an obvious candidate for initiating and operating such a practice. It could also be administered by accounting firms, whose clients would trust them on the issue of confidential disclosure, and which might similarly be trusted by those with new ideas.

Conclusion

Brexit may indeed offer opportunities for economic development, but they will not present themselves automatically. They will have to be sought out. Escaping from being subject to the consensus of the 27 other countries of the EU does nothing to reduce the daunting nature of creative law-making. Success in this particular case will depend on the ability of the government to reconcile a much larger number of vested interests with new laws for protecting information. Those suggested above, as well as in Kingston (2015), could have a disproportionately valuable effect in promoting the new wave of technological innovation that is now required if Brexit is to succeed.

Disclosure statement

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