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LSE Law, Society and Economy Working Papers 20/2013

London School of Economics and Political Science

Law Department

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Why Patent Law Doesn't Do Innovation Policy

Sivaramjani Thambisetty *

Abstract: Calls for patent law to take on a more explicit innovation policy agenda have recently increased in urgency. There is however a considerable difference between incentive to invent and incentive to innovate in terms of outcome. Institutional dynamics in patent systems based on the incentive to invent premise constrict rationality and decision-making capability to the extent that an injection of externally devised 'innovation policy' seems impossible unless also accompanied by far reaching institutional changes. In both US and Europe technology-specific legal standards in patent law and market specific economic analysis in competition law are a natural point of congruence when considering existing institutional dynamics that support innovation.

This short essay looks primarily at European law to analyse the different ways in which patent law is inured to resist the imposition of economic analysis common to competition policy. There are however spaces within current legal rules that lend themselves well to an examination of the sector specific commercial contexts of inventions. These can and ought to be used robustly to better reflect elements of market specific innovation policies.

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INTRODUCTION

The congruence and dissonance between competition policy and patent law is very instructive as it exposes a number of assumptions about the real and perceived function and capabilities of patent law. Innovation policy is a complex mix of technology, investment and market specific impetus¹ and generally there is an accepted distinction between technological innovation and non-technological innovation.² A specific point of congruence between competition policy and patent law is the need for and extent of sector-specific legal and economic analysis that gives content to rules of law directed towards technological innovation. In patent law sector specificity is deeply ambiguous and for the most part hidden within the internal workings of the patent system. Some commentators have written about specific ways in which competition policy does feed into patent law.³ Before addressing specifics, however, it is essential to consider the institutional first principles of patent law comprehensively as they define and constrain the opportunities for reform and are true in some degree of many, if not most, jurisdictions.

INCENTIVE TO INVENT OR INCENTIVE TO INNOVATE

Invention can seed innovation, but it usually also requires commercial and technological need and the opportunity to transform one into the other.⁴ As such, the discovery of an invention and its transformation into innovation are, economically and sociologically, ‘entirely different things’.⁵ In the patent system the blurring of the distinction is particularly pernicious when the need to promote innovation is used as a justification to grant patents for inventions or to dilute patentability criteria so as to increase the possibility of patents on certain categories of inventions that may not hitherto have enjoyed such a possibility.

¹ See BJG van der Kooij, ‘Innovation Defined: A Survey’, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2265782 accessed 12 September 2013.

² T Schmidt and C Rammer, ‘Non Technological and Technological Innovation: Strange Bedfellows?’ Centre for European Economic Research Discussion Paper no: 07-052.

³ See for instance TF Cotter, ‘The Procompetitive Interest in Intellectual Property Law’ (2006) 48 *William & Mary Law Review* 483 and S Kieff, ‘Removing Property from Intellectual Property and (Intended?) Pernicious Impacts on Innovation and Competition’ Law and Olin Research paper Series no: 411.

⁴ See P Spiridon and P Clipa, ‘Innovation: Variation on the Same Topic’ (6 October 2010), available at <http://dx.doi.org/10.2139/ssrn.1688527> accessed 12 September 2013.

⁵ JA Schumpeter, *Business Cycles – A Theoretical, Historical and Statistical Analysis of the Capitalist Process* (McGraw-Hill Book Company 1939) 85.

(Although the contrary is also possible, it is unlikely given the difficulty in scaling back property rights, once the possibility exists.)⁶

In the first decision by the UK SC, Lord Neuberger in *Human Genome Sciences Inc v Eli Lilly*⁷ offered that the purpose of the patent system was ‘to provide a temporary monopoly as an incentive to innovation, while at the same time facilitating the early dissemination of any such innovation through an early application for a patent, and its subsequent protection’. This case has resulted in a slackening of the industrial application criterion of patentability in the context of genomic inventions as a result of which inventions that were unlikely to be held patentable prior to the decision can now expect to get a shot at a patent. The European Commission used the same term ‘incentive to innovate’ when it considered innovation as an objective for both intellectual property and competition law.⁸

There are a number of strategic drivers of innovation, not all of which depend on exclusive property rights for knowledge or technology management. Levine and Boldrin make a strong case for open competition in the absence of exclusive rights.⁹ In some cases, obtaining exclusive rights that are then freely licensed propels innovation,¹⁰ and in some other cases private investment has gone into denying exclusivity for all in the hope of even greater innovation – termed ‘property pre-empting investments’ by Merges.¹¹ It has often been pointed out that it is possible to build competitive advantages in multiple ways that do not rely on patents alone, in some industries more than others. Although we may only have information that is incomplete in many ways, to assume that one needs exclusive property rights in the form of patents in all sectors and in all circumstances is incredibly limiting, and potentially misguided.¹²

Property rights to inventions are not a proxy for effective ‘innovation policy’. In the case of emerging technologies like synthetic biology, a loose understanding of the conditions necessary for strategic or responsible innovation can lead to calls for ‘letting the patent system do its thing and grant patents’ as the best way to promote innovation with possible anti-competitive consequences that can take years to reverse.¹³ For instance the position eventually arrived at in *AMP v Myriad* is a legal position that is as old as the start of genomic research, argued and well

⁶ Aided in part by eager patent offices and captured by special interests (See Hovenkamp *The Opening of American Law: Neoclassical Legal Thought, 1870–1970* (forthcoming: Oxford University Press 2014) Ch 10 ‘The Twisted Path to Innovation’).

⁷ [2011] UKSC 51.

⁸ Commission Decision *Microsoft/W2000* (Comp/C-3/37.792) [712].

⁹ M Boldrin and DK Levine, *The Case Against Intellectual Property* (Cambridge University Press 2008).

¹⁰ Such as in the case of ‘foundational’ technologies like non-exclusively licensed PCR technology. JP Walsh and WM Cohen, ‘Research Tool Patenting and Licensing Biomedical Innovation’ (2003) Available at <http://sippi.aaas.org/utt/WalshetalAAAS.pdf> accessed 12 September 2013.

¹¹ R Merges, ‘A New Dynamism in the Public Domain’ (2004) *University of Chicago Law Review* 183–203.

¹² Rai likens this to the impact of anti-discrimination law where ‘facially neutral’ standards have a disparate impact. A Rai, ‘Building a Better Patent System: Combining Facially Neutral Patent Standards With Regulation of End Product Therapeutics’ (2008) 45 *Houston Law Review* 1037–1057.

¹³ *AMP v Myriad Genetics* 569 US 12-398 (2013).

reasoned by scientists and legal academics.¹⁴ It has taken the US Supreme Court 20 years to tap into the relevant thinking in the field – 20 years of never knowing the true cost of the chilling effect of broad monopoly patents granted to genomic DNA.

There are other ways in which patents misjudge the nature of innovation. Patents are designed as a winner-takes-all prize given at the end of a competitive race to invent. Rules of priority, recently harmonised between the US and EU systems, and notions of absolute novelty reinforce the aim of rewarding the first to file for a patent application on a discrete invention – claim construction doctrines in both US and European patent law, with some differences, aim to grant the inventor an ‘effective’ (and fair) monopoly over his invention. The patent race institutionalises a specific myth of the single inventor¹⁵ as well as of the ‘complete invention’ – the device, product or process that is capable of being commercialised independent of other devices, products or processes. We now know, however, that inventions for the most part are a collaborative phenomenon,¹⁶ simultaneous or near-simultaneous invention is frequent,¹⁷ and technologies that are patented can be one part of a multitude of technology fragments that may need to go into making one viable product or service.

Patent statutes are designed to enquire into the conditions and circumstances of ‘invention’ – how many had tried before to find a solution to the particular problem that the invention solves, whether this invention creates a surprising effect, whether there were prejudices in the field preventing or suppressing the invention – questions of this ilk that embellish the right of the winner of the patent race to an exclusive monopoly over his invention. Thus the non-obviousness enquiry, and through it, the inclinations and prejudices of the person skilled in the art is a major preoccupation for decision-makers that forces them to pick and unpick the specific conditions of origination of the invention.¹⁸ Having been preoccupied by the competition and circumstances that precede the point of invention, the patent system has no perspective on the direction of the subsequent process of innovation, any more than it has control over the post-grant behaviour of the winners it has feted.

¹⁴ Such as in the works of Rebecca Eisenberg, Phillippe Ducor, and Robert Cook-Deegan and many others.

¹⁵ M Lemley, ‘Myth of the Sole Inventor’ Stanford Public Law Working Paper No. 1856610; L Shaver, ‘Illuminating Innovation: From Patent Racing to Patent War’ (2012) 69:4 *Washington & Lee Law Review*.

¹⁶ See S Johnson, *Where Good Ideas Come From: The Seven Patterns of Innovation* (Penguin Books 2010).

¹⁷ Lemley (n 15).

¹⁸ See for instance B Sherman, ‘Patent Law in a Time of Change: Non-Obviousness and Biotechnology’ (1990) 10 *Oxford Journal of Legal Studies* 278; JH Barton, ‘Non-Obviousness’ (2003) 43 *IDEA* 475.

CONSTRICTED RATIONALITY IN THE PATENT SYSTEM

The patent system suffers from foundational pluralism – both utilitarian and deontological, some of which were refined through periods of hostility when the social purpose of these rights faced intense scrutiny. The patent abolitionist movements in Europe (1850–1872) saw values like free international trade and justice for inventors pitted against privilege and monopoly in the form of patents. JS Mill supported the patent system as a useful device to wipe out arbitrariness in the pursuit of justice or reward for the inventor; while other supporters, including Lord Stanley, objected to patents as a mechanism that made it ‘impossible to prevent great injury being inflicted on others’.¹⁹ Even the language used in the 1623 Statute of Monopolies demonstrates plurality of values that need to be balanced.²⁰

Modern-day justifications for the grant of patents are considerably weakened by the puzzle around two potentially incommensurable ideas – the artificial scarcity of information and the generation of information. The patent system creates artificial scarcity in information through the grant of exclusive rights in order to incentivise the further generation of information. Generation of intellectual products, however, does not happen in a vacuum and is a function of accessibility to previously generated information. The dynamic link between information scarcity and generation is a major source of legal disagreements in patent law; and legal doctrine often reflects the effort to find a balance between these two utilities.

According to Merges, foundational pluralism, coupled with ‘maddeningly inconclusive data’ about whether society is better off with intellectual property rights than without such rights, gives rise to several optimising behaviours. Ideas about social utility – the purpose behind patent rights – give way to doctrinal details and discussion of the rights themselves. Coping mechanisms such as ‘heavily weighing the inconclusive positive data, showing IP law is necessary and efficient, discounting inconclusive data on the other side’, and sometimes, ‘ignoring the data altogether, or pretending that more solid data were just around the corner’ are rife.²¹

Although normative approaches can be very illuminating minus policy-based touchstones, these free-standing views amount to nothing more than ‘stage-setters’²² in that give way to institutionalised decision-making processes within open-ended legal doctrines. Such doctrines include the person skilled in the art, obvious to try, construction of claims within a patent application, or resolving

¹⁹ F Machlup and E Penrose ‘The Patent Controversy in the Nineteenth Century’ (1950) 10 *Journal of Economic History* 1.

²⁰ Providing letters patents to the: ‘true and first inventor and inventors of such manufactures which others, at the time of making such letters or grant, shall not use, so as also they be not contrary to the law, nor mischievous to the state, by raising prices of commodities at home or hurt of trade or generally inconvenient’.

²¹ R Merges, *Justifying Intellectual Property* (Harvard University Press 2011) 3.

²² *ibid* 3.

whether a disclosed ‘use’ is compatible with existing legal standards of industrial application. Lemley describes a similar scenario of the ‘fractioning of patent law’ where decision-making is broken down into smaller and smaller issues. In the search for a justifiable rationality, patent law engages with the purposes of patent law rarely or not at all.

The inability to resolve foundational pluralism coupled with technical uncertainty about inventions and close attention to specific doctrines, and the constant need to make decisions under conditions of uncertainty can severely constrict rationality in the patent system, a process I map out in another paper.²³ Illustrative instances in the context of the interpretation of exclusions in the European Patent Convention (EPC) are numerous. The EPC excludes animal varieties from patentability, but the narrow interpretation of the term by the European Patent Office (EPO) means that genetically modified animals may be patented. Applicants have only to ensure that the term ‘animal variety’ is not used in the application.²⁴ Similarly, computer programs explicitly excluded in the EPC may be patented as long as the patent description incorporates ‘technical’ components as banal as servers or other general-purpose equipment.²⁵ Thirdly, most ‘diagnostic methods’ are now patentable provided at least one step in the process of diagnosis is practised away from the human or animal body, which can be readily incorporated into the description of the diagnostic method invention.²⁶

As a decision-making heuristic these examples direct the EPO away from granting the right kind of patents to merely granting patents. The shift is one that typifies a move away from the plurality of values underlying the patent system towards a kind of rationality that relies on certainty, rather than legitimacy of goals. On a broader level these heuristics signal ever shrinking spaces in which to consider plurality of purpose through a robust weighing-up of costs and benefits. In one illustration involving derivative pharmaceutical inventions the US Court of Appeals for the Federal Circuit (CAFC) examined the patentability of a metabolite of a known substance – the court was concerned that in patenting the original molecule, the metabolite lacked novelty. While the court held that the inherency doctrine is applicable to ‘accidental, unwitting and unappreciated’ anticipation of metabolites of known substances, the court was also at pains to point out claim-drafting techniques that might avoid inherent anticipation (including claiming the metabolite in isolated form and as a pharmaceutical composition).²⁷

Collectively, the pressure of making decisions under new and complex technological circumstances and the use of these kinds of heuristics are likely to

²³ S Thambisetty, ‘Learning Needs in the Patent System: Implications from Institutionalism for Emerging Technologies like Synthetic Biology’ LSE Law, Society and Economy Working Papers 19/2013. Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2272980 accessed 12 September 2013.

²⁴ Case T-315/03 *Harvard/Transgenic animal* [2005] EPOR 31 (EPO (Technical Board of Appeal)).

²⁵ Case T-258/03 *Hitachi/automatic auction method* [2004] OJ EPO.

²⁶ G 1/04 *Diagnostic Methods* G 0001/04 OJ EPO 334.

²⁷ *Schering v Geneva* 348 F 3d 992 (Fed Cir 2003).

result in isomorphism,²⁸ where adaptive outcomes (such as learning behaviour, coordinated expectations, satisficing and the development of mental maps)²⁹ become the goal, rather than improving efficiency, performance or striving towards external goals such as a better innovation policy. One obvious example of a driver of isomorphism in international intellectual property law is seen in the TRIPS Agreement, where countries are obliged to implement 'normal' tests for patentability criteria such as novelty, inventive step and industrial application.³⁰ Mimesis itself becomes a benchmark of legitimacy. Provisions such as section 3(d) of the Indian Patent Act defy the norm and are therefore considered illegitimate,³¹ although this provision can be justified on the basis of other, explicitly stated, objectives of the TRIPS Agreement and its purposive interpretation in light of that country's own legal history.³²

While it may not be possible, or even wise, to examine the pros and cons of patenting specific kinds of subject matter in every case and at every level of litigation, the above examples emphasise that many decision-making heuristics in the patent law, developed largely as a coping mechanism to counter uncertainty or incomplete information, are determinative of the quality of patent law. Constricting rationality shrinks spaces for broad goal-based analysis.

DECISION-MAKING INEFFICIENCIES IN PATENT LAW

Decision-making in the patent system is diffused over several institutions – patent offices, specialist and generalist courts. In a multi-institutional patent system³³ decisions are made through and influenced by a complicated feedback loop between courts, patent offices and users. Each of these institutions has specific proclivities that together impact on the coherent development of legal doctrine. Even if we assume that institutions in the patent system were designed for optimal decision-making, over time they respond to their environment or strike bargains in ways that can restrict current goals or limit future possibilities.

²⁸ PJ DiMaggio and W Powell, 'The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields' (1983) 48 *American Sociological Review* 147.

²⁹ S Thambisetty, 'Timing, Change and Continuity in the Patent System' in S Hauns and others (eds), *The Politics of Intellectual Property: Contestation Over the Ownership, Use and Control of Knowledge and Information* (Edward Elgar 2009).

³⁰ Art 27. See RC Dreyfuss, 'TRIPS and Essential Medicines: Must One Size Fit All? Making the WTO Responsive to the Global Health Crisis' in Pogge, M Rimmer and Rubenstein (eds), *Incentives for Global Public Health: Patent Law and Access to Essential Medicines* (Cambridge University Press 2010).

³¹ See 2013 USTR Special 301 report blacklisting India. Available at <http://www.ustr.gov/sites/default/files/05012013%202013%20Special%20301%20Report.pdf> accessed 12 September 2013.

³² K Shadlen, 'Learning from India? A New Approach to Secondary Pharmaceutical Patents', available at <http://blogs.lse.ac.uk/indiaatlse/2013/05/03/a-new-approach-to-pharmaceutical-patents/> accessed 12 September 2013.

³³ AK Rai, 'Engaging Facts and Policy: A Multi-Institutional Approach to Patent System Reform' (2003) 103 *Columbia Law Review* 1035.

The following are three examples of ways in which decision-making can be constrained in the European patent system as a result of institutional complexity. First, there are conflicts between the administrative disposition and quasi-judicial function of patent offices. A good illustration is seen in the self-perception of the EPO based on article 4(3) of the EPC. In *Diagnostic methods* article 4(3) was interpreted as an administrative mandate to *grant patents*, rather than interpreted in light of the statutory framework or even the purpose of patent law.³⁴ In this case, article 4(3) formed the basis for a very narrow reading of the exclusion of ‘diagnostic methods’, making it easier to patent appropriately claimed diagnostic methods.

Secondly, the constraints of lower specialist courts and greater decision-making resources available to higher generalist courts can lead to different assessments. For instance, the EPO cannot take matters such as competition law, the needs of the single market or European human rights jurisprudence into account, yet its decisions may have great impact on such matters. The European Court of Justice (ECJ) in contrast can take a more purposive approach in interpreting patentability standards (but only those arising from the Biotechnology Directive). In the case of *Monsanto v Cefetra*³⁵ the ECJ relied on a purposive interpretation of article 9 of the Directive³⁶ to allow the importation of soya meal into the Netherlands, even though this soya meal was ‘contaminated’ with a gene patented in Europe but not in Argentina where the soya meal originated. The ECJ saw the gene as present but inert, rather than being expressed, which is the function for which it was patented in the first place. This view of the scope of a gene patent is radically different from the scope of a chemical product patent that would demand strict liability for infringement. Many patent determinations in this field are routinely made on the basis of analogising DNA to chemical products – a restrictive heuristic that does not bind an appellate generalist court like the ECJ.

There is, however, great opposition within the European patent system to the ECJ. Despite the dramatic opportunity for reform presented by a Unitary Patent Court, a great deal of institutional time has been spent keeping the ECJ out of the administration of the unified patent. The ‘mistrust’ of the ECJ survives in spite of gains made by the court over the last 60 years in advancing the single market and has been termed in an editorial of the *International Review of Intellectual Property and Competition Law* (IIC) as ‘schizophrenic and foolish’.³⁷

In the US, the specialist nature of the CAFC and the generalist nature of Supreme Court caused R Dreyfuss to write that:

³⁴ *Diagnostic Methods* (2006), G 0001/04 OJ EPO 334.

³⁵ C-428/08 *Monsanto v Cefetra* [2010] All ER (D) 65 (Jul) (ECJ).

³⁶ Directive 98/44/EC on the legal protection of biotechnological inventions OJL 213, 30/07/1998 p 0013–0021.

³⁷ T Jaeger, ‘Shielding the Unitary Patent from the ECJ: A Rash and Futile Exercise’ (2013) *International Review of Intellectual Property and Competition Law* 44, 389–391 390.

On several issues, the court [CAFC] has swung back and forth between extremes. In other arenas, no single approach has developed. Nor has Supreme Court review helped. The Court deals with patent law in the same way that it deals with other fields: it articulates norms and policies, but it rarely lays down specific rules. Instead, it leaves implementation to the lower courts. But with only one appellate court to refashion the law, and with that court the one whose decision was (often unfavorably) reviewed, the outcomes can leave much to be desired. As Rebecca Eisenberg so aptly put it, the relationship between the Supreme Court and federal patent law “sometimes seems like that of a non-custodial parent who spends an occasional weekend with the kids”. In short, it appears that federal law depends rather crucially on percolation in intermediate courts, even in a field like patent law with clear statutory underpinnings.³⁸

Multiple locations for decision-making may not itself be a problem, if we did not also have a system where the incentives to litigate are highly skewed in favour of those who own patents.³⁹ In most areas of litigation that follow precedents it is often assumed that judges will favour efficient rules, inefficient rules will be litigated more often and that litigants advocating efficient rules have greater incentives than those advocating inefficient rules to incur legal expenses that increase the likelihood of a favourable decision.⁴⁰ In patent systems, however, a patentee's incentive to defend his patent grossly exceeds an alleged infringer's incentive to challenge it. Where there are multiple infringers, patent invalidity judgments result in patents being turned into public goods, removing the ability of a patent attacker to exclude others from appropriating the benefits of a successful attack. Even where multiple likely infringers compete in a product market pre-litigation, royalties are often passed through at least in part to consumers downstream. Therefore there is no economic reason to expect direct infringers to challenge a patent, even if they act collectively. Moreover, losing a challenge can be a very different outcome from the alternative of uncomplainingly paying non-discriminatory royalties, as challengers often find themselves subject to injunctions or less favourable licensing terms.⁴¹

Patentees can also charge differential royalties to penalise firms that do not settle early; all the above weaken the infringer's incentive to challenge in the first place.⁴² Further, patent litigation is inaccessible to many users (and would-be

³⁸ RC Dreyfuss, 'Percolation, Uniformity, and Coherent Adjudication: The Federal Circuit Experience' *Southern Methodist University Law Review* (2013) (forthcoming).

³⁹ J Farrell and RP Merges, 'Incentives to Challenge and Defend Patents: Why Litigation Won't Reliably Fix Patent Office Errors and Why Administrative Review Might Help' (2004) 19 *Berkeley Technology Law Journal* 943.

⁴⁰ O Hathaway, 'Path Dependence in the Law: The Course and Pattern of Change in a Common Law Legal System' (2001) 86(2) *Iowa Law Review* 601.

⁴¹ Farrell and Merges (n 39).

⁴² Ibid.

abusers)⁴³ of the system because of the eye-watering costs of litigation. These dynamics coupled with a dense cluster of decision-making authorities in a patent system make patent litigation a poor way to weed out sub-optimal or inefficient legal doctrine⁴⁴ let alone allow doctrine to be tested against indeterminate benchmarks like ‘innovation policy’.

MAKING THE MOST OF ROUTINE EXCEPTIONALISM IN PATENT LAW

One of the most vaunted features of the patent system is the uniform approach it takes to inventions in all fields of technology – both in terms of the duration of the right and in the strength or scope of the right. Considering that widely disparate industries experience patents very differently, a monolithic patent incentive has come in for its fair share of critical attention.⁴⁵ It is monolithic in the sense that all inventions are subject to the same procedures (examination, opposition, re-examination), the same substantive patentability criteria (novelty, inventive step, disclosure requirements, etc.) and last for the same duration. A uniform patent system probably owes much to the design of the patent right as property.⁴⁶ Just as we cannot build up severable components or a modular approach to property, we cannot delink aspects of the patent right to suit different circumstances. Doing so would unacceptably tamper with the incentive effect of the patent right. That, at least, is the theory.

In reality patent law leverages technical information specific to different sectors in numerous ways. One only has to look at the patent examination manuals such as that of the UKIPO,⁴⁷ which specifically address ‘biotechnological inventions’ or ‘medical inventions’ to see that ‘uniform’ patent standards are in reality open-textured and allow a great deal of flexibility – flexibility that is used by patent offices to tailor the patent examination process, and by courts when considering validity. For instance, in Europe computer-implemented-inventions can be sufficiently disclosed by generic diagrams that represent the functionality of the program; whereas applications for genetic inventions require sequence information that could run to a large number of pages. The differences in these requirements arise from different capabilities (often contested) of the ‘person skilled in the art’ in each field. Similarly non-obviousness standards in different

⁴³ C Helmers and L McDonagh, ‘Trolls at the High Court?’ LSE Law, Society and Economy Working Paper Series no: 13/2012 discussing why this is true of the UK system.

⁴⁴ S Thambisetty, ‘Patent Litigation in the UK: Solutions in Search of a Problem?’ (2010) 32(5) *European Intellectual Property Review* 238.

⁴⁵ See C Long, ‘The Uniform Patent System’ (2008) 55 *The Federal Lawyer* 44.

⁴⁶ H Hovenkamp (n 6).

⁴⁷ www.ipo.gov.uk/pro-types/pro-patent/p-law/p-manual/p-manual-practice.htm accessed 12 September 2013.

technology sectors draw on aptitudes as well as negative prejudices of the person of average skill in the field. A technologist in a field that moves rapidly would naturally take more risks than a person in a more established field less open to revisionist technology.⁴⁸

'Facially neutral'⁴⁹ patent law, however, has a deeply ambiguous relationship with any exceptional approach that distinguishes between different kinds of technology. Despite confusion and apprehension⁵⁰ about the implications of an explicit, technology specific application of standards in reality and within the nitty-gritty of operations, patent law is anything but technology-neutral. While current debate on innovation policy seems to be moving towards consensus that disparate industries use and experience patents differently, there is considerable disagreement about what, if anything, ought to be done about the overtly one-size-fits-all patent system.

Roin, for instance, offers a 'time to market' foundation for a system of tailoring patent length to balance the benefits of innovation against the social cost of patents in different sectors;⁵¹ Lemley and Burk resist the temptation to tamper with the duration of the patent but look instead to the multiple ways in which the patent system does take technological specificity into account.⁵² Rai considers *economic non-patentability* standards to help with categories like business methods.⁵³

Several commentators have called for the introduction of a 'competition law ethos' into intellectual property law in general and patents in particular.⁵⁴ Given that innovation policy is domain-specific or tailored to market structure and industries, there seems to be a natural congruence between technology specificity in patent law and competition law's purposive embrace of sector-specific economic analysis. A goal-based patent law that adopted relevant elements of innovation strategies could find the space to assess economic arguments for or against patentability as part of a broadly utilitarian approach. Such an approach of weighing costs and benefits is not unknown in patent law,⁵⁵ although it is largely marked by partially justified or difficult to resolve empirical claims.⁵⁶

Radical attempts to inject economic analysis into the patent system in the absence of an equally radical overhaul of the institutional dynamics that constrict

⁴⁸ See S Thambisetty (n 23) 22–25.

⁴⁹ A Rai (n 12).

⁵⁰ *ibid* (n 1).

⁵¹ Benjamin Roin, 'The Case for Tailoring Patent Awards Based on the Time-To-Market of Inventions' June 2013. Available at www.law.harvard.edu/faculty/faculty-workshops/roin.faculty.workshop.summer-2013.pdf accessed 12 September 2013

⁵² Lemley and Burk, 'Policy Levers in Patent Law' (2003) *Virginia Law Review* 89 No 7 1575–1696.

⁵³ A Rai (n 12).

⁵⁴ Among others, I Lianos and RC Dreyfuss, 'New Challenges in the Intersection of Intellectual Property rights with Competition Law – A View from Europe and the United States' CLES Working Paper Series 4/2013; H Hovenkamp, 'Institutional Advantage in Competition and Innovation Policy' September 12 2013. Available at www.ucl.ac.uk/cles/research-paper-series/research-papers/cles-4-2013 accessed 12 September 2013.

⁵⁵ Such as the utilitarian calculus formulated by the EPO in the Oncomouse decision where the likelihood of animal suffering has to be balanced by substantive medical benefits in order for a patent to be granted despite the morality clause in Art 53(a). T0315-03 (July 2004).

⁵⁶ See Merges' discussion of utilitarian assessments within mid-level principles. Merges (n 21).

rationality would be very likely to lead to even greater incoherence. The most productive approach would be to revisit all the ways in which the patent system is truly technology-specific, to acknowledge and make it more visible so that we can regulate such specificity with careful inputs of sector-specific economic analysis. As a natural point of congruence between competition policy and patent law such exercises can be undertaken without venturing into an overall theory of what patents are for, or trying to resolve pluralism or incommensurability of values.⁵⁷

To demonstrate how specific commercial information is currently used to illuminate technical uncertainty in patent law, consider the level of ‘ordinary skill in the art’ at the sub-doctrine level. Conventionally the person skilled in the art can take commercial factors into account when it impinges on his state of *common general knowledge*.⁵⁸ In the so-called ‘technical prejudice’ sub-test of non-obviousness, prejudices against undertaking a particular research path may be reinforced by commercial possibilities.⁵⁹ Although usually evidence of commercial success cannot bolster claims of technical merit, it may be used if the commercial success is directly relevant to the technical worth of an invention. Another sub-test – the long-standing ‘obvious to try’ test – was revised in the UK after it was criticised as being removed from the commercial realities of pharmaceutical screening research.⁶⁰ Only those research possibilities that had no prospect of succeeding were considered inventive; this was revised down to include prospects that only had a fair expectation of success.⁶¹

A second example is provided by patent offices’ resistance to alternate epistemologies of knowledge which are likely to harm innovation in sectors that rely on unprecedented technologies where prior art may be found in unconventional locations and formats. A more explicit turn towards technology specificity would allow patent offices to include alternate modes of recording and storing changing technologies. In the case of synthetic biology, for instance, patent offices appear to be underprepared to deal with newer innovation strategies.⁶² The BioBrick foundation uses the ‘Request For Comments’ (RFCs) mode for help in standard setting – these RFCs represent a wealth of data and reflect current thinking in the field.⁶³ The UK Intellectual Property Office and the EPO do not

⁵⁷ J Pila, ‘Pluralism, Principles and Proportionality in Intellectual Property’ *Oxford Journal of Legal Studies* (2014) (forthcoming). Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2304794 accessed 12 September 2013.

⁵⁸ Different from state of the art. *Wheatley v Drillsafe* [2001] RPC 7. In the case of technology sectors populated by large corporations with well-organised R&D units, the degree of information circulating can skew notions of common knowledge *Beloit v Valmet* (No.2) [1997] RPC 489 per Aldous LJ.

⁵⁹ *Pozzoli SpA v BDMO SA and Moulage Industriel de Perseigne SA* (2006) EWHC 1398 (Pat).

⁶⁰ H Laddie, ‘Patents – What’s Invention Got to Do with it?’ in Vaver and Bentley (eds), *Intellectual Property in the New Millennium: Essays in Honour of William R Cornish* (Cambridge University Press 2004) 91–95.

⁶¹ *Conor Medsystems v Angiotech* 2008 UKHL 49.

⁶² AK Rai, ‘Let’s Tame Software Patent Claims: Lessons from Bioinformatics’, available at <http://www.wired.com/opinion/2012/11/software-patents-bioinformatics/> accessed 12 September 2013.

⁶³ S Thambisetty (n 23) 33.

currently use RFCs as prior art.⁶⁴ Given the mix of proprietary and non-proprietary strategies in this emerging sector, an unschooled patent office will leave the door wide open for opportunistic patent applicants, potentially causing innovation roadblocks further on.

So, is the patent system able to contribute to the building of a better innovation system? Currently institutional arrangements in the patent system self-evidently cannot incorporate the kind of economic analysis that is commonly used by competition lawyers and authorities. Introducing material that is foreign into the patent eco-system without also considering far-reaching changes to the institutional set-up is a recipe for unintended consequences. Patent institutions can, however, engage more actively with the economic impact of the rights they are granting through established open-ended standards such as non-obviousness, prior art and disclosure requirements. Currently technical uncertainty is softened to only a minor degree by commercial analysis. These locations deep within the internal workings of patent law provide the best opportunity to introduce more robust sector-specific innovation analysis within present institutional dynamics. If we are to build a patent system that is more responsive to innovation policy, the best way to do it, I suggest, would be not top-down (by imposing competition law values through legislation) or even bottom-up (by introducing new sector-specific rules and arrangements), but inside out.

⁶⁴ Discussion, 'Workshop on Synthetic Biology, Innovation and Intellectual Property: Toward a UK Strategy' 24–25 June 2013 London.