

Competition Policy Review: Draft Report, September 2014

Submission on patent and copyright issues

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This submission deals specifically with Section 8.1 titled "intellectual property".

The term "intellectual property" encompasses a range of interventions into the market, with quite different eligibility criteria and privileges. As a result use of this term can lead to imprecise thinking and unclear communication. In responding to the draft report my major focus is on patents, with some minor comments on copyright and very brief attention to four other potential impediments to the spread of innovation.

I support the view of the Competition Policy Review draft report that the range of statutory interventions into markets for creative and inventive goods and services is a priority area for review. Such interventions can facilitate or inhibit creativity and innovation and policy should be developed on the basis of evidence. To date it has been based on the relative political influence of competing interest groups.

I do not however agree that there should be a "framework-style review of "IP". The priority area in urgent need of review is the patent system where standards have fallen to very low levels. As I argue below I do not believe that the 2000 Intellectual Property and Competition Review Committee was adequate in respect of the patent system (IPCRC 2000). The patent system is in urgent need of a fundamental, independent, evidence-based, economic evaluation of the extent to which it operates to efficiently and effectively promote innovation which would not otherwise take place while minimising interference in the spread and adoption of innovation. That is, does it meet clause 5.1 of the Competition Principles Agreement?

The IPCRC review was far more evidence based in respect of copyright. As major copyright issues have also recently been reviewed by the Australian Law Reform Commission (ALRC 2014), the priority in this area is reviewing the data available for ensuring evidence-based policy, and taking steps to fill the gap.

A second area meriting immediate attention is the proportionality of penalties. There are increasing moves for criminal provisions in "trade" treaties, so the issue of criminality in these statutory economic policies also needs to be reviewed *ab initio*. Criminality in copyright is an accident of history. The original copyright statutes provided a right to enter and search for possible infringing material – a right that was critical in an era before the establishment of police forces. Abuses of this right in the early twentieth century in New York city led to removal of this right and replacement with criminal provisions for copyright infringement so that enforcement by regular police forces was possible (Boldrin and Levine 2008: chapter 2). A fundamental review of appropriate, proportionate, penalties for breaching patent, copyright, trademark or plant variety statutes is needed. Such a review should consider both penalties for infringement and penalties for undermining the law. The latter are almost non-existent and encourage "rights-holders" to push the boundaries of existing policy and law towards increasing strong privileges for "rights-holders".

Patents, innovation and competition

Patents attempt to encourage industrial invention by limiting competition in the (technological) area patented. The privileges granted allow the patent owner to prevent anyone else undertaking any commercial activities in the patented area, even if they have

independently invented the same process or product. This is a very powerful exclusive right and thus needs to be used parsimoniously. It is neither efficient nor effective if patents are granted for inventions that would be undertaken absent the patent incentive.

This might appear to be hard to operationalise, but there is both theoretical argument (Bonatti and Comino 2011) and substantial evidence that patents are most needed where copying is fast and relatively cheap and where initial research and development (R&D) costs are high. In such circumstances the inventor is unlikely to have sufficient exclusive time in the market to recoup the cost of the R&D investment. There are empirical studies showing that copying is usually neither fast nor cheap (Levin et al. 1987; Mansfield, Schwartz and Wagner 1981). There is a vast empirical literature showing that in most industries firms report that patents are generally not needed to obtain a good return on investment in R&D (summarised in Moir 2013b: chapter 2 and López 2009). As a result the uninterrogated economic argument that patents are needed as knowledge can be copied without cost or time is simply wrong.

Interestingly, during the period when empirical evidence has mounted showing that patents are generally not needed to support industrial innovation, patents have been made available over a wider subject matter range and for increasingly less inventive “inventions” (Mazzoleni and Nelson 1998). Such extensions are based on changes in patent office practices, judicially determined rules or trade negotiations, never on the basis of solid economic evidence.

The major industry where patents may be justified is the chemical and pharmaceutical industry. While pharmaceutical industry reports of the cost of Phase III clinical trials appear to be substantially over-estimated (Light and Warburton 2011), nonetheless it is widely accepted that many useful new drugs might not be developed without patent monopolies. In fact the true picture is more nuanced than this – the German chemical industry achieved global leadership on the back of a patent system that granted patent monopolies for chemical processes but not for chemical products (Dutfield 2003). Unfortunately the TRIPS Treaty requires no discrimination between technology fields.

There is an important second strand to the argument to intervene in the market and provide patent monopolies. This is that inventions are presumed to have social returns that can be greater than the private returns. Clearly where private returns are high, the invention can proceed without government assistance. But where private returns are low, but total social returns are high, then a society might wish to provide an incentive to induce the invention.

An efficient and effective patent system is therefore one where patents are only granted where the following two conditions hold:

- the invention would not occur absent patents; and
- the social return exceeds the cost of the static efficiency loss from grant of the patent.

This is very far from the patent system that operates in Australia today.

Although the patent system is a major plank of innovation policy, to date it has never had a thorough economic review.¹ The 1984 Industrial Property Advisory Committee (IPAC) review was billed as an economic review, but the one economist on the panel lodged a dissenting report saying “[t]his report does not live up to its claim to have adopted an economic perspective and to have applied economic criteria. ... It is constrained by the very ‘haze of

¹ And in ten years of studying and writing about the patent system I have never found an economic evaluation in any country.

assumptions about rights and rewards for inventors, special pleading by those directly involved, and a plethora of legal procedures and criteria in the Patents Act' that it deploras." (IPAC 1984: 79-80).

The Intellectual Property and Competition Review Committee (IPCRC) "reviewed" the patent system against Clause 5.1 of the Competition Principles Agreement that:

"legislation should not restrict competition unless it can be demonstrated that:
 (a) the benefits of the restriction to the community as a whole outweigh the costs; and
 (b) the objectives of the legislation can only be achieved by restricting competition."

Unfortunately the IPCRC review *assumed* that the patent system required inventiveness for grant of a patent (IPCRC 2000). Consideration of the instructions in the Patent Examiners' Manual would have shown that the ordinary meaning of inventive is entirely absent from the rules governing patent policy and administration. Subsequent research has demonstrated that the quantum of inventiveness required for grant of a patent is miniscule – more a miniscule difference than a miniscule quantum of inventiveness (Moir 2013a; Moir 2013b). This research is based on a scientifically selected sample of granted patents and an investigation of the rules which allow such uninventive "inventions" to be granted patents. Had the IPCRC review looked at the facts of how the patent system actually works it would have reached a very different conclusion. It is not, therefore, possible to say that the required evaluation of the patent system under the Competition Principles has yet been undertaken.

In 2003 the US Federal Trade Commission (FTC) found, with respect to the US patent system that a "plethora of presumptions and procedures tip the scales in favor of the ultimate issuance of a patent, once an application has been filed." (FTC 2003: 8). The same is true in Australia. The *Patent Act 1990* assumes that every application is novel and inventive. It is then up to the patent examiner to refute this assertion. In fact the examiner is given the even narrower task of determining whether the application is obvious, not whether it fails to be sufficiently inventive for the dynamic benefits to exceed the static efficiency losses. Further, there are a large number of specific doctrines which add up to the fact that the word "obvious" in the patent system has a particular and narrower meaning than the ordinary meaning. Other rules make it almost impossible for an examiner to reject an application that combines two or three well-known things. For example already patented pharmaceuticals are regularly combined with well-known delivery mechanisms to achieve secondary patents which delay generic entry into the pharmaceutical market (Moir and Palombi 2013).²

Another example of a change in the patent system which effectively allows the same patent to be granted twice is the practice of granting patents for new uses of known things. Speaking at the ANZAAS Conference in 1954, the then Commissioner of patents, H. R. Wilmot was quite specific on this issue "the discovery of an unknown property in a known material is not patentable, primarily because no manufacture in the sense of a physical thing is disclosed" (Wilmot 1954: 3). Just five years later the High Court reviewed the legal understanding of a "manner of manufacture" in a decision that has subsequently been interpreted as being that patentable subject matter is anything that can make a dollar in the

² See also examples in Hazel Moir and Deborah Gleeson, "Explainer: evergreening and how big pharma keeps drug prices high", *The Conversation*, 6 November 2014 (<https://theconversation.com/explainer-evergreening-and-how-big-pharma-keeps-drug-prices-high-33623>).

marketplace.³ This very broad interpretation of the 1959 decision has never been subjected to any economic review. It undermines the presumption in the mind of lawmakers that patents are only awarded for technological inventions and for "things that are a significant advance over what was known and what was available to the public."⁴ The lack of any economic evidence-based evaluation of the subject matter criterion for patent eligibility since *NRDC* has led directly to today's standard practice of granting patents for new uses of previously patented chemicals. But the original patent for the chemical itself restricts competitors from all commercial uses of the chemical during the patent period. To then grant a further patent for a specified use of that chemical has the character of re-patenting the same thing, though the second patent is narrower in scope.⁵ This form of double-dipping is a travesty of sound economic policy.

Against this background a framework review is far from sufficient.

What Australia's innovators urgently need it is a thorough economic review of the patent system, given that patent law implements economic policy. This review needs to identify the types of inventions where grant of a patent is in the national interest. It should recommend changes needed to bring patent policy into line with providing only such patents. These recommendations should include changes that cannot yet be implemented because of international treaties to which Australia is a signatory. These latter matters could form part of Australia's negotiating package in future regulatory treaties.⁶

Only 20 per cent of Australian innovating firms use the patent system,⁷ yet when infringement is alleged it is only innovating firms who can be sued. And the fact that a patent is for an uninventive invention does not mean that it cannot be used to cause economic damage. It is simply not good enough to say "[i]n the majority of cases the granting of an IP right is unlikely to raise significant competition concerns." Patent policy has to date been developed in the total absence of evidence. But the lack of data on how patents are used, does not mean that one can claim that patents are either unlikely to be used or that they do not raise competition concerns.

The lack of data appears to be deliberate – IPAC recommended in 1984 that data on patent use be collected when patents were renewed. No action has been taken and today, when over 17,000 patent monopolies are being granted each year, IPAustralia still collects no data on their use. While there is no direct evidence as to why Australia collects no data there is

³ *National Research Development Corporation v Commissioner of Patents* (1959) 102 CLR 252 (*NRDC*).

⁴ Explanatory Memorandum, Intellectual Property Laws Amendment (Raising the Bar) Bill 2011, p.42.

⁵ Once a new pharmaceutical product is on the market it is used by a much larger number of people than those involved in Phase III clinical trials. It is during this on-market phase (Phase IV) that side-effects, both positive and negative become apparent. While data on these might need to be presented to the Therapeutic Goods Authority to gain specific marketing approval for the new positive side-effect, the costs of doing this are far less than for Phase III clinical trials. There is usually informal use of the product for the new treatment prior to any formal registration of the product for the new use.

⁶ What go by the name of "free trade agreements" are no longer this. They reach far into the realm of domestic policy, often in extraordinarily pedantic detail. They are more appropriately referred to as regulatory treaties. For a discussion of what a balanced patent policy might look like see Moir 2014.

⁷ In 2004-05 the Australian National Innovation Survey showed that 34 per cent of Australian firms were innovating (Australian Bureau of Statistics 2005: 12). About 2,100 firms were introducing "new to the world" innovations, and about 2,800 firms "new to the Australia" innovations. It is these firms that might be expected to own patents. Data on methods used to protect intellectual property are not provided by type of innovation. For all innovating firms, 3.8 per cent used patents. If all reported patent use is among new to the world/Australia innovators, then about one in five such firms use the patent system.

evidence from the USA that the beneficiaries of patent systems act to prevent independent evidence being collected.⁸

There are few data on how granted patents are used, but we know from the many reports on the outcomes of court cases that patents for very uninventive (to the ordinary person) inventions are upheld by courts and used to suppress competitors. Court cases are known to be only the tip of the iceberg in terms of patent use. Many innovative firms receive regular solicitor's letters advising them that they are infringing a patent. These firms then have to divert resources into providing a solid response to ensure that the action is cut off at the beginning. Indeed this is a major reason that firms take out patents – to threaten counter-suit in the event of alleged infringement (Cohen, Nelson and Walsh 2000). Patents beget patents.

The fact that a patented invention is uninventive does not prevent it from causing economic harm. In 2013 Bayer successfully sued Generic Health Pty Ltd for infringement of its patent for yet another low dose combination contraceptive pill.⁹ Even in the USA, which also has very low standards for the grant of patents, this "invention" had been found to be obvious.¹⁰ Indeed as oral contraceptives were first marketed in Australia in 1961 and there are at least 83 alternative products on the market,¹¹ mostly for low dose combinations, it is hard to envisage much inventiveness in another such product. Similarly Catuity, who had independently invented a dynamic storage card for use on transport systems, was found to have infringed Welcome's dynamic storage loyalty card. The essence of the invention was use of dynamic storage on a consumer loyalty card. All parties to the dispute agreed that dynamic storage was well-known to IT workers. However it was not known to consumer loyalty workers so Heerey J ruled that the disputed patent was valid and infringed.¹²

As the current broken patent system is currently being written into the planned Trans Pacific Partnership Agreement (TPPA) in great and pedantic detail, a thorough economic review of the patent system is urgently needed. If this is not undertaken now it will be too late as we will have signed away our right to reform this broken system.¹³

There is considerable evidence that Australia's patent system probably breaches Article 7 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs):

⁸ Kahin (2003) reports that, subsequent to the *State Street* case the White House Office of Science and Technology Policy commissioned the Science and Technology Policy Institute at RAND to undertake a study on software patent quality and business effects. He notes that "it was suspended at the request of a U.S. multinational company concerned that the study would undercut efforts to secure greater international acceptance of software patents". Kahin also reports that the American patent bar successfully lobbied to remove a US Government Accountability Office (GAO) study of business method patents from the *American Inventors Protection Act* of 1999. The FTC recommendation most strongly rejected by the Intellectual Property Owners Association is recommendation 10 for increased evidence based analysis of the patent system (Bessen and Meurer 2008: 293-4).

⁹ *Bayer Pharma Aktiengesellschaft v Generic Health Pty Ltd* (No 2) [2013] FCA 279.

¹⁰ *Bayer Healthcare v. Watson Pharmaceuticals*, CAFC 2013 12-1397.

¹¹ Such data are hard to trace for Australia. However in respect of the large US market, MedlinePlus, a service of the US National Library of Medicine lists 83 different brand names as at 28 April 2013 (<http://www.nlm.nih.gov/medlineplus/druginfo/meds/a601050.html#brand-name-2>).

¹² *Welcome Real-Time SA v Catuity Inc* [2001] FCA 445. A database on Australian patent cases that have reached courts was created a few years ago – but unfortunately the most important information – the size of penalties and other costs – was not included (Weatherall and Jensen 2005).

¹³ See Hazel Moir, "How trade agreements are locking in a broken patent system", 20 October 2014 at <https://theconversation.com/how-trade-agreements-are-locking-in-a-broken-patent-system-32564>.

"The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."

There is currently only one element of the patent system that acts in favour of users of new technology – that a granted patent cannot be presumed valid (patent act, S.20). Even this one small element of balance is currently under attack in proposed Article H.2.3 of the draft TPPA chapter on "intellectual property".¹⁴

A framework review of all "intellectual property" is inadequate to ensure that the principles in clause 5.1 of the Competition Principles Agreement are met in respect of the patent system. Australia needs and deserves a specific, thorough and detailed review of patent policy. Such a review must be independent and evidence based. It should focus on the economic effect of the patent system. It should make recommendations to ensure that the patent system is parsimonious, efficient and effective. If, as many in the patent community believe, some 80 to 85 per cent of granted patents are "rubbish",¹⁵ then it is more than time they were removed and the system changed to prevent such abuses of regulatory intervention in the market. As shown above even "rubbish" patents can cause economic harm, and in the pharmaceutical field there is clear evidence that generic entry is delayed by low quality patents, to the substantial cost of both the Australian tax payer and the generics industry (Moir and Palombi 2013).

Copyright policy

The copyright system is in less need of urgent review, though here too policy is largely based on argument rather than evidence. Indeed, much of the evidence put forward by interested parties is highly suspect, particularly evidence on economic losses caused by unauthorised uses.¹⁶ Despite the lack of policy-relevant data on the benefits to creators compared to the benefits to distributors from the copyright system, the 2000 IPCRC analysis was far sounder than that for patents, as there were no inaccurate assumptions as to how the system worked. The ALRC has also recently reviewed digital copyright issues (ALRC 2014). Nonetheless most discussions of patent policy avoid the most important question – does the system as it operates now actually benefit creators and encourage creation?

The reality – that as currently shaped, copyright policy acts more in the interests of distributors than creators – rarely shapes copyright policy. Instead we have seen copyright policy increasingly tilted in favour of distributors. Although we have all been subject to substantial propaganda over the past 30 or more years, the fact is that when a film is copied without authorisation it is the distributors not the creators who lose income.¹⁷ The extension of copyright for a further 20 years after the author's death is widely known to be due to lobbying to prevent Disney's Mickey Mouse from falling into the public domain. Australia granted such an extension in 2004 when it signed the Australia-United States Free Trade Agreement (AUSFTA), despite evidence of the high cost (Dee 2005). Now, only ten years later the USA is again pushing for a further 20 years extension in the copyright term in

¹⁴ 2014 version. Available at https://www.wikileaks.org/tpp-ip2/#article_e4.

¹⁵ Personal communication from long-serving member of the patent community.

¹⁶ The Joint Standing Committee on treaties' report 126 on the proposed Anti-Counterfeiting Trade Agreement considered that the evidence of a significant problem was weak (see discussion at pp 9-11).

¹⁷ See the substantial data on financial benefits in the Australian film industry in Court 2013.

the context of the TPPA. Again, it is clear that such an extension is not in Australia's interest as we buy more copyrighted content from overseas than we sell.

The priority need for the copyright system is the development of better data on returns to creators and distributors. A start has been made on this for the film industry (Court 2013), but similar data are needed for the many other types of creation that receive automatic blanket global copyright "protection". Once such data are available a thorough economic review will be possible.

In the meantime there are two issues that need attention.

Firstly, there is an imbalance in the rights provided to authors and the rights provided on sale of a copy of the work. Copyright operates globally, and typing the © sign in the frontispiece of a published work is all that is needed to achieve full copyright privileges in all countries that are signatories to the Berne Convention. In contrast, particularly in regard to digital copies, sellers usually limit use to a particular geographic region. For example if the owner of an Amazon kindle moves countries, Amazon will lock up all the items that the kindle owner has purchased, on the grounds that Amazon is insufficiently powerful to negotiate global copyright with publishers.¹⁸ As is well known, the distributors of films have coded the copies they sell so that if the owner of the copy moves between regions they have difficulty viewing the copies they legitimately own.

A further issue in regard to the balance between rights and privileges is the layering of copyright, digital rights management technologies and technological protection measures. Effectively the used of various forms of encryption both undermines the economic argument for copyright protection and reduces the rights passing to the purchaser on acquisition of a legitimate copy. This again is a form of double dipping and needs careful review.

And finally, the fact that registration is not required – the feature that substantially delayed US entry into the Berne Convention – is highly questionable. The lack of registration directly causes the major problem of orphan works. Given the importance of disseminating cultural materials this provision needs urgent review in the context of considering the balance of rights and obligations between creators and users of copyrighted materials.

The second major issue raised by copyright is criminality. Copyright is a policy designed to encourage creators and artists by providing them with economic rights to prevent unlawful copying. The damage done by unlawful copying is economic, and it is up to the copyright owner to take civil action to recover the loss. It is therefore hard to see why penalties should include criminal penalties. Indeed such penalties are an accident of history, as outlined at the beginning of this submission. Criminal penalties for copyright infringement are disproportionate and inappropriate. There should be an urgent review of criminality in both copyright and other industrial property interventions to identify and limit these. While criminal penalties might be appropriate where a court order has been contravened, the simple act of unauthorised use, on whatever scale, should be penalised by making good the economic damage done. And no more.

Plants

Australia first introduced "protection" for plant varieties in 1987, then amended this act in 1994 to reflect changes in the 1978 and 1991 versions of UPOV. Only new, distinctive, stable and uniform varieties can be protected under the Plant Breeders Rights Act (PBRA). The

¹⁸ Email from Amazon to the author. This condition is not clearly spelled out on the page where kindle purchases are made.

original objective of the legislation was to encourage plant breeding efforts in Australia. Unlike the patent system the PBRA specifically provides for user access to protected varieties, including farmer's privileges. But plants are also patentable, largely because in Australia almost anything can be patented. Any review of "protection" systems for plants needs to consider how the patent and PBR systems interact and the impact of plant patents on farmer's privileges.

Trade Marks

Australia's trademarks legislation was substantially rewritten in the *Trade Marks Act 1995*, as a result of Australia's accession to the Madrid system for the international registration of marks (commonly known as the Madrid Protocol). Like the Patent Cooperation Treaty, this provides a simplified path for a company to register a mark globally.

The trade marks system has substantially changed character – from protection of producers and buyers from counterfeit products, to a marketing tool. Instead of being limited to simple logos or words, trademarks can now be acquired for sounds, smells, colours, shapes and phrases. It is not, however, clear what economic harm is caused by this substantial shift to a marketing character. Whether more recent trade negotiation moves to globalise national systems of "well-known" marks is welfare-enhancing is unclear. So too is the expansion of trade marks to geographic indicators.

Trade Secrets

As there are moves to amend the terms of trade secrets in regulatory treaties such as the TPPA, there is a need for some economic consideration of how trade secrets law works and its economic impact on both competition and innovation.

Non-compete clauses

Non-compete clauses are often included in contracts of employment. Such clauses are not allowed under California's constitution, except in a small set of specific circumstances. Boldrin and Levine point to research suggesting that the lack of non-compete clauses in California is a major reason for the success of Silicon Valley (Boldrin and Levine 2008: chapter 8). Non-compete clauses are anti-competitive in their intent, and can impact negatively on the establishment of innovative businesses. An economic review of how such clauses operate in Australia would be of value.

References

- ALRC. 2014. "Copyright and the digital economy." Australian Law Reform Commission Report 122.
- Australian Bureau of Statistics. 2005. "Innovation in Australian Business." Canberra: Australian Bureau of Statistics, Cat. No. 8158.0.
- Bessen, J.E. and M.J. Meurer. 2008. *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk*. Princeton and Oxford: Princeton University Press.
- Boldrin, M. and D.K. Levine. 2008. *Against Intellectual Monopoly*. Cambridge: Cambridge University Press.

- Bonatti, L. and S. Comino. 2011. "The inefficiency of patents when R&D projects are imperfectly correlated and imitation takes time." *Journal of Institutional and Theoretical Economics* 167(2):327-342.
- Cohen, W.M., R.R. Nelson, and J.P. Walsh. 2000. "Protecting their intellectual assets: appropriability conditions and why U.S. manufacturing firms patent (or not)." Cambridge, MA: National Bureau of Economic Research.
- Court, D. 2013. "Shakespeare's fortune: why copyright has failed authors and how it might be reformed." PhD, Crawford School, Australian National University.
- Dee, P. 2005. "The Australia-US Free Trade Agreement: An Assessment." Canberra: Australia-Japan Research Centre, Australian National University.
- Dutfield, G. 2003. *Intellectual Property Rights and the Life Science Industries: A 20th Century History*. Burlington: Ashgate.
- FTC. 2003. *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy*. Washington, D.C.: Federal Trade Commission (US).
- IPAC. 1984. *Patents, Innovation and Competition in Australia*. Canberra: Industrial Property Advisory Committee (now available at http://www.acip.gov.au/reviews_other.html).
- IPCRC. 2000. "Review of Intellectual Property Legislation Under the Competition Principles Agreement: Final Report." Canberra: Attorney-General's Department (Intellectual Property and Competition Review Committee).
- Kahin, B. 2003. "Information process patents in the US and Europe: policy avoidance and policy divergence." *First Monday* 8(3).
- Levin, R.C., A.K. Klevorick, R.R. Nelson, and S.G. Winter. 1987. "Appropriating the returns from industrial research and development." *Brookings Papers on Economic Activity, Special Issue on Microeconomics* 1987(3):783-831.
- Light, D.W. and R. Warburton. 2011. "Drug R&D costs questioned." *Genetic Engineering and Biotechnology News*:6-7.
- López, A. 2009. "Innovation and appropriability: empirical evidence and research agenda." Pp. 1-32 in *The Economics of Intellectual Property: Suggestions for Further Research in Developing Countries and Economies in Transition*, edited by WIPO: WIPO.
- Mansfield, E., M. Schwartz, and S. Wagner. 1981. "Imitation costs and patents: an empirical study." *The Economic Journal* 91(364):907-918.
- Mazzoleni, R. and R.R. Nelson. 1998. "The benefits and costs of strong patent protection: a contribution to the current debate." *Research Policy* 27:273-284.
- Moir, H.V.J. 2013a. "Fabricating invention: the patent malfunction of Australian patent law." *Agenda* 20(2):21-38.
- Moir, H.V.J. 2013b. *Patent Policy and Innovation: Do Legal Rules Deliver Effective Economic Outcomes?* Cheltenham, UK: Edward Elgar.
- Moir, H.V.J. 2014. "Trade treaties and patent policy: searching for a balanced approach." in *15th International Schumpeter Society Conference*. Friedrich Schiller University, Jena, Germany.
- Moir, H.V.J. and L. Palombi. 2013. "Patents and Trademarks: empirical evidence on 'evergreening' from Australia." in *4th Asia-Pacific Innovation Conference*. National Taiwan University, Taipei.
- Weatherall, K.G. and P.H. Jensen. 2005. "An Empirical Investigation into Patent Enforcement in Australian Courts." *Federal Law Review* 33(2):239-286.
- Wilmot, H.R. 1954. "Some aspects of the Australian patent system." in *ANZAAS General Meeting*.