

PART 1

Defending Our Rights

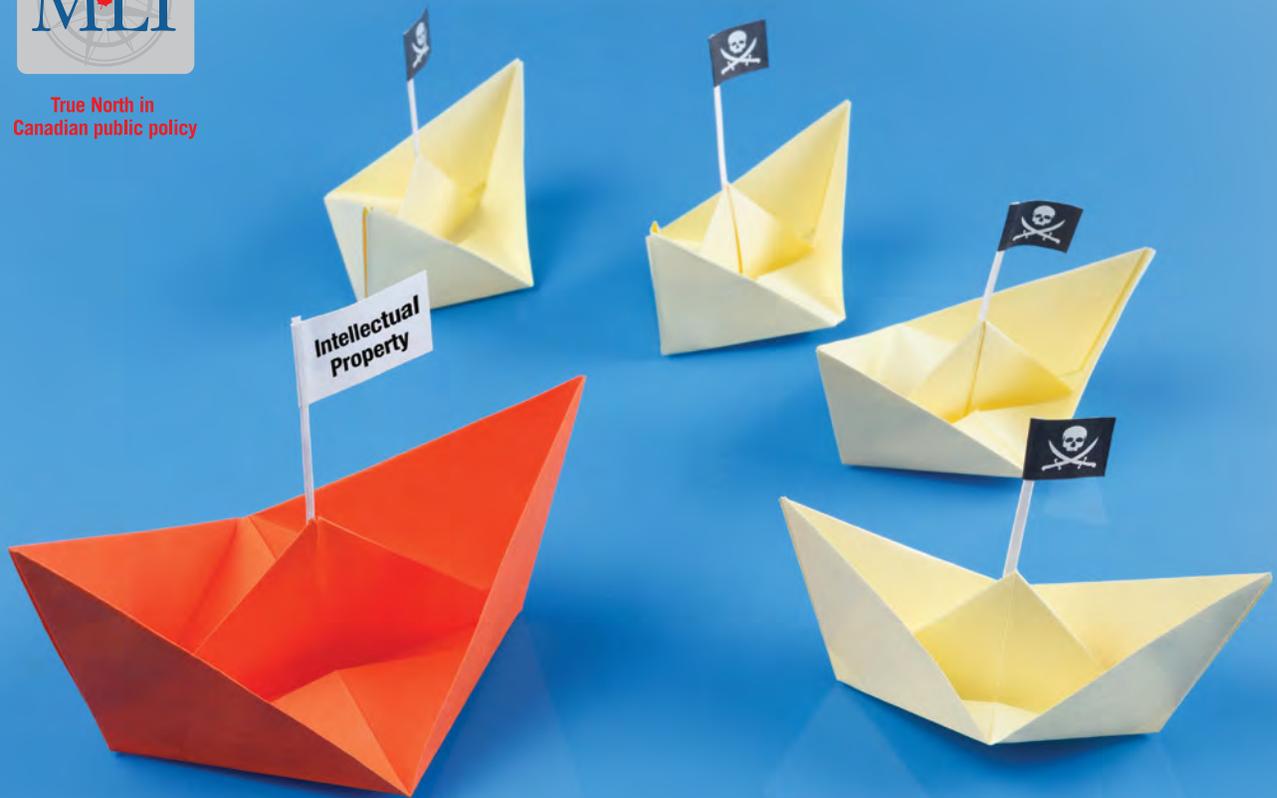
Why intellectual property protection matters to Canada

Richard C. Owens with Michael Robichaud

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True North in
Canadian public policy





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Executive Summary

Once an arcane subject, intellectual property protection is now a hot topic. Increasingly technology touches nearly everyone, and everyone seems to have opinions about IP. More broadly, Canada's economic future depends on increased productivity, which depends on innovation, which in turn depends on improving intellectual property rights.

Canada's government seems to understand what's at stake. In the 2017 federal budget the government announced it will develop an IP strategy "to help ensure that Canada's intellectual property regime is modern and robust and supports Canadian innovations in the 21st century."

There is plenty of work to do. This paper is the first of a series of three papers examining the importance of strong intellectual property rights (IPRs) and Canada's record on intellectual property protection. It will make the case in principle and empirically that the incentive effects of IPRs are essential to an innovative economy. As an added bonus, they don't cost the government anything.

We can do better. Canada was almost alone (with South Africa) among G20 nations in seeing a substantial decline in R&D spending between 2004 and 2014. Canada also has had middling rankings in international indices on innovation and IPRs, and has taken up residence on the "watch list" in the Office of the US Trade Representative's *Special 301 Report*.

We do not wish to be alarmist. Canada has an advanced and relatively current set of IP laws, and makes inroads into having a robust innovation economy. But Canadian tendencies and influences in the country regarding IPRs are worrisome. The coming strategic renewal should be a great opportunity to refresh a Canadian approach that has been recently wayward and misdirected.

Key highlights of this study's findings include:

- Relative to other OECD countries, Canada rates poorly in comparative indices of the strength of IPRs. There is considerable room for improvement.
- Numerous studies prove stronger patent protection correlates highly with economic growth, with research and development spending, and availability of start-up financing.
- Strong IP laws encourage technology transfer and foreign direct investment and with these come improved national diffusion of new technologies.
- Strong IP laws encourage the growth of smaller firms and protect them from the strategic behaviour of large firms. They also encourage firm specialization and productive dealing between firms.

As in other fields of human achievement, naysayers, doubters, detractors and other nabobs of negativism clutter the ideascapes of IP with a range of perspectives from reasonably considered economic arguments (if often wrong or incomplete), to more radical critiques infused with quasi-millennarian intoxication (also wrong).

But economists believe that the rate of growth of an economy is directly related to the introduction of new products, each one adding to the existing stock of human knowledge. Strong IPRs allow this. Predictable and stable property rights may be old school, and necessarily invoke trust in the invisible hand of the market, but they work. They are the only system that does, or can.

This paper makes the following recommendations:

Be bold. End term limits for copyright: Copyright protection does nothing to reduce the store of common property. Copyright does not even create a monopoly, and there is no reason it should be singled out from other types of property for expiry. This would be a bold move demonstrating global leadership in IP. In the more conservative alternative, adopt the already widely-used term of 70 years plus the life of the author, gaining Canadian creators the like benefit in European markets.

Don't fear the Harvard mouse. Protect wide patent subject matter: Out of step with all OECD countries and with the plain wording of Canada's *Patent Act*, the Supreme Court of Canada ruled

that so-called “higher life forms” could not be patented in the case of the “Harvard mouse”. The decision was a blow to Canada’s life sciences industry, and the case brings into doubt all future, unknown classes of patent. Accordingly, Canada should legislate patent protection for higher life forms, and interpretative principles for the *Patent Act* that make it clear that anything under the sun (or indeed, elsewhere in the universe) made by man and that meets the standards of the *Patent Act*, is patentable, subject only to express, legislated exceptions.

Help the little guy. Facilitate patenting by SMEs: Small and medium size businesses drive much of Canada’s innovation economy. They tend to be insufficiently grounded in the possibilities of IP to help to grow their businesses. Accordingly, we recommend to facilitate patenting by SMEs, perhaps by reducing or waiving fees for first patents, and further publicizing the value of IP protection.

Catch up to the world. Implement trade agreements and their IP provisions: Canada is lucky to have rigorously negotiated, sound agreements to open trade in the Pacific Rim and to Europe, through the TPP and CETA respectively. The former, admittedly, is in considerable doubt at the moment. Still, the IP requirements of these agreements will benefit Canada. Accordingly, it is our recommendation to implement the TPP and CETA, subject to other signatory nations doing so, and continue to further support freer and harmonized trade in IPR-protected goods.

Sommaire

Sujet autrefois obscur, la protection de la propriété intellectuelle (PI) suscite maintenant un vif intérêt. La technologie touche de plus en plus de gens et chacun a une opinion sur la PI. Plus généralement, l’avenir économique du Canada est lié à l’évolution de la productivité, laquelle est tributaire de l’innovation, qui à son tour dépend de l’amélioration des droits de propriété intellectuelle (DPI).

Le gouvernement du Canada semble comprendre ce qui est en jeu. Le budget de 2017 annonce qu’il élaborera une nouvelle stratégie en matière de propriété intellectuelle pour « contribuer à faire en sorte que le régime de propriété intellectuelle du Canada soit moderne et solide et qu’il soutienne les innovations canadiennes au XXI^e siècle ».

Ce document est le premier d’une série de trois dont l’objet est de mettre en lumière l’importance de droits forts et de présenter le bilan du Canada en matière de protection de la propriété intellectuelle. On démontre au moyen des principes qui les régissent et sur la base de l’expérience pratique que les droits de propriété intellectuelle ont des effets incitatifs cruciaux au sein d’une économie innovatrice. En prime, le gouvernement n’a aucun coût à engager à ce titre.

Les droits de propriété intellectuelle ont des effets incitatifs cruciaux au sein d’une économie innovatrice.

Le Canada peut faire mieux. Le pays était pratiquement le seul du G20 (avec l’Afrique du Sud) à connaître une baisse substantielle de ses dépenses en R et D entre 2004 et 2014. Le Canada occupe également le rang du milieu dans les indices internationaux sur l’innovation et les droits de propriété intellectuelle et figure sur la liste « à surveiller » présentée dans le rapport annuel « *Special 301* » du Bureau du Représentant américain pour le Commerce.

On ne veut pas être alarmiste. Le Canada est doté d’un système avancé et relativement actuel de lois sur la propriété intellectuelle et a réalisé des progrès pour soutenir une solide économie de l’innovation. Toutefois, les tendances et les influences exercées au pays en ce qui concerne les droits de propriété intellectuelle sont préoccupantes. Le renouvellement stratégique à venir devrait être une excellente occasion d’actualiser l’approche canadienne, laquelle a récemment été dirigée dans de mauvaises directions.

Les points saillants de cette étude sont les suivants :

- Selon les indices comparables à ceux d’autres pays de l’OCDE, le Canada fait piètre figure en ce qui concerne la force des DPI. Il y a beaucoup de place pour l’amélioration.

- De nombreuses études démontrent la corrélation directe entre une meilleure protection des brevets et la croissance économique, ainsi qu'avec les dépenses en R et D et la disponibilité de fonds pour les entreprises en démarrage.
- Des lois fortes en matière de propriété intellectuelle favorisent le transfert de technologie et l'investissement étranger direct, lesquels élargissent à leur tour la diffusion des nouvelles technologies.
- Des lois fortes en matière de propriété intellectuelle favorisent la croissance des petites entreprises et leur permettent de se mettre à l'abri des comportements stratégiques des grandes sociétés. Elles encouragent aussi la spécialisation et la conclusion d'ententes productives entre entreprises.

Dans le domaine de la propriété intellectuelle, comme dans bien d'autres liés au développement humain, les sceptiques, les incrédules, les détracteurs et autres nababs du négativisme congestionnent l'horizon de la réflexion avec un éventail de points de vue qui vont des raisons considérées en bonne partie comme étant économiques (lorsqu'elles sont fausses ou fragmentaires) aux critiques radicales portées par une fièvre quasi millénariste (également fausses).

Toutefois, selon les économistes, le taux de croissance d'une économie est directement lié à l'introduction de nouveaux produits, chacun d'entre eux enrichissant le stock existant des connaissances humaines. C'est ce que permettent des droits forts en matière de propriété intellectuelle. La prévisibilité et la stabilité des droits de propriété sont des principes anciens qui font nécessairement appel à la main invisible du marché, mais ils fonctionnent. Il s'agit du seul système qui fonctionne et qui a effectivement la capacité de fonctionner.

Dans ce document, on présente les recommandations suivantes :

Faire preuve de détermination. Mettre un terme aux limites imposées aux droits d'auteur :

La protection du droit d'auteur ne réduit aucunement la propriété commune. Le droit d'auteur ne crée même pas de monopole, et rien ne justifie de lui attribuer un statut différent des autres types de propriété sur le plan de la durée. Ce geste déterminé en matière de propriété intellectuelle serait un bel exemple pour le reste du monde. Une alternative plus conservatrice serait d'adopter la pratique largement répandue qui limite la durée du droit d'auteur à 70 ans après la mort de l'auteur, ce qui procurerait aux créateurs canadiens un avantage semblable à celui offert sur les marchés européens.

Ne pas craindre la « Souris de Harvard ». Protéger les brevets à domaine large : En décalage avec tous les pays de l'OCDE et le libellé même de la *Loi sur les brevets* du Canada, la Cour suprême du Canada a jugé que les dénommées « formes de vie supérieures » dans l'affaire de la « Souris de Harvard » n'étaient pas brevetables. La décision a porté un coup dur à l'industrie canadienne des sciences de la vie et rend incertains tous les types inconnus de brevets futurs. Le Canada doit donc légiférer sur la protection des brevets qui concernent les formes de vie supérieures ainsi que sur les principes d'interprétation de la *Loi sur les brevets* pour faire en sorte qu'absolument tout ce qui est fabriqué par l'être humain sur Terre (ou ailleurs dans l'univers) et qui est conforme aux normes de la *Loi sur les brevets* soit brevetable, les seules exceptions étant celles expressément prévues par la loi.

Aide à l'intention des petits joueurs. Faciliter l'octroi de brevets aux PME : Ce sont surtout les petites et moyennes entreprises qui font croître l'économie de l'innovation. Or, elles ont tendance à ne pas suffisamment tirer parti des possibilités en matière de PI pour faire croître leurs entreprises. Par conséquent, on recommande de faciliter l'octroi de brevets aux PME, en réduisant ou en éliminant le coût des premières demandes de brevet, par exemple, et de mieux faire connaître la valeur des DPI.

Rattraper le reste du monde. Mettre en œuvre les accords commerciaux et leurs dispositions en matière de PI : Le Canada a pu résolument conclure des accords robustes pour l'ouverture du commerce avec le Pacifique Rim et l'Europe, soit le PPT et l'AECG respectivement. Le premier accord, il est vrai, est considérablement incertain à l'heure actuelle. Il n'en demeure pas moins que les exigences en matière de propriété intellectuelle de ces accords seront avantageuses pour le Canada. Par conséquent, on recommande de mettre en œuvre le PPT et le l'AECG si les autres pays signataires font de même, et de continuer à appuyer la libéralisation et l'harmonisation des échanges de biens protégés par des DPI.

Introduction

Intellectual property rights (IPRs) are fundamental to the Canadian economy. Canada's economic future depends on increased productivity, which depends on innovation, which in turn depends on improving IPRs.

In this paper, the first of a series, we review the powerful utilitarian, economic, and theoretical support for IPRs, and demonstrate IPRs' close correlations to measures of innovation success. Subsequent papers will look more deeply into the Canadian response to IPRs particularly; a recent history of IPRs in Canada; the political and other challenges impeding the progress of IPRs in Canada; the problem of stimulating pharmaceutical research; studies of innovation; innovation with public funds through investments in university research; and other issues. This paper makes a series of policy recommendations, as will the following papers.

Without IPRs the market for innovation is dead – IPRs are an abstract, but critical, piece of government-provided infrastructure. They are created by statutes. As technology changes, these statutes need to evolve. While we are a small country, the resources to keep pace with international initiatives in intellectual property (IP) ought not to exceed Canada's grasp. To keep pace is very much in our competitive interest.

Indeed, in its recent 2017 Budget the Government of Canada asserted the importance of IPRs and stated its intention to build a renewed strategy for them:

INTELLECTUAL PROPERTY STRATEGY 2017

Canada's intellectual property regime provides a framework that supports innovation across all sectors of the economy. Intellectual property rights incentivize creativity and the development of new ideas and technologies by helping companies, academics and inventors recoup their investment once new products reach the marketplace.

In recognition of the importance of a well-functioning intellectual property regime, Budget 2017 announces the Government will develop a new intellectual property strategy over the coming year. The strategy will help ensure that Canada's intellectual property regime is modern and robust and supports Canadian innovations in the 21st century. (Finance Canada 2017, 87)

Strategic renewal should be a great opportunity to refresh a Canadian approach that has been recently wayward and misdirected.

Amongst the community of IP commentators, unanimous support for stronger IPRs should ring out; alas, there are many who oppose them. Their positions will be dealt with in this and subsequent papers. Outspoken commentators like Professor Michael Geist of the University of Ottawa Faculty of Law, and Jim Balsillie, ex co-CEO of Blackberry and a prominent commentator on innovation in Canada, both argue for a "made in Canada" approach to diminished IPRs based variously on an antipathy to strong property rights and on Canada's trading position in IP-intensive industries.¹ At the heart of Mr. Balsillie's arguments seems to be Canada's admittedly poor history of innovation. In referring to the higher standards of IPR required by the Trans-Pacific Partnership (TPP), Mr. Balsillie (2016) writes: "Canada does not have the arsenal of valuable IP to benefit financially from such provisions." In fact, such an assertion is neither true nor germane. Canada does substantial trade in markets for IP, and in any event will benefit from the incentive effects of strong IPRs to spur further innovation. They are no hindrance. Professor Geist asserts, in a discussion of whether Canada's IPR idiosyncrasies can survive a Trump administration:

Canadian digital policy over the past decade has been marked by a "made-in-Canada"

approach that ensures consistency with international law but reflects national values and norms. On a wide range of issues – copyright rules, net neutrality, anti-spam legislation, and privacy protection among them – the federal government has carved out policies that are similar to those found elsewhere but with a more obvious emphasis on striking a balance that includes full consideration of the public interest. (2017)

If this is true, it is time it changed. The quirks of Canadian IP laws (generally, they are better referred to as flaws) to which Professor Geist refers will be discussed in this and subsequent papers. To the extent

“Canada is being left behind in the race to reap wealth from technology.”

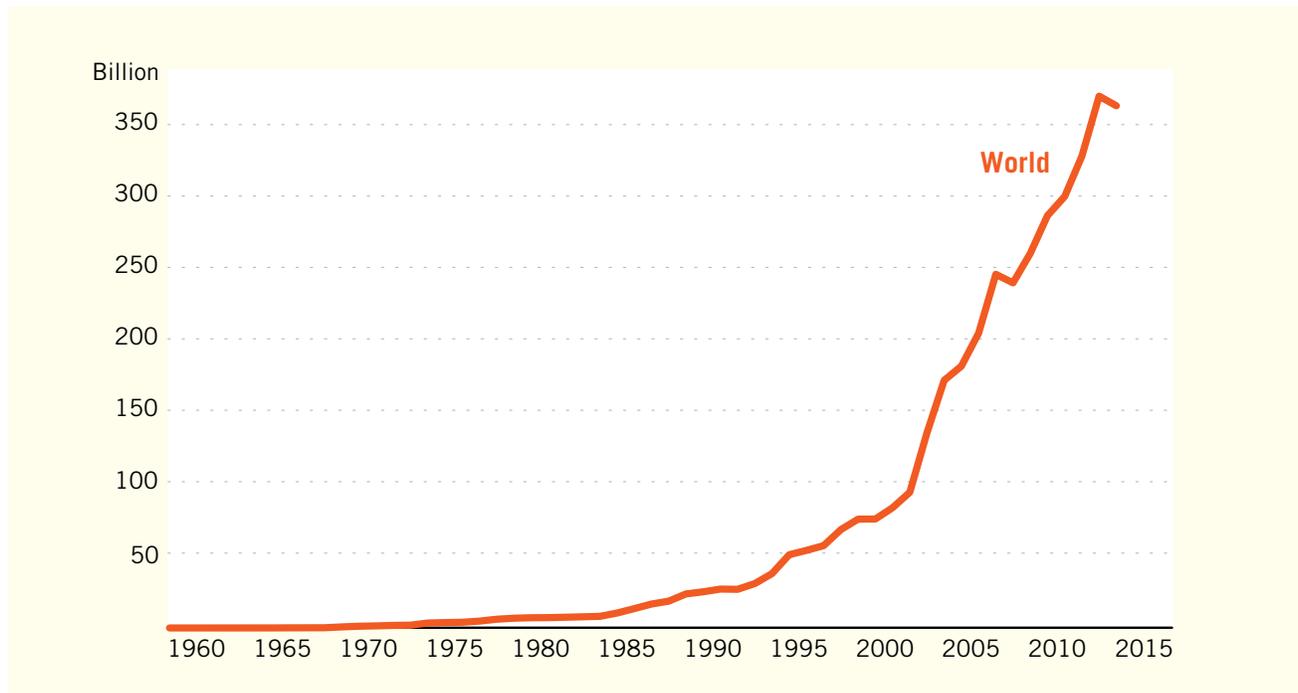
that they reflect a weaker IPR regime than is in effect elsewhere in the world, they hurt Canada, not only by diminishing local incentives but by creating unnecessary costs, hurting trade relations, and creating avoidable political tension. IP is all about international norms – not the narcissistic invention of parochial ones.

Government intervention in innovation has a spotty record in Canada. There are obvious things that government can do to help to create a more innovative economy: reduce or get rid of

capital gains taxation, lower tax rates generally, and support scientific research and education. The availability of private risk capital and public fiscal restraint are critical elements of an innovative economy (Dutta, Lanvin, and Wunsch-Vincent 2016, xxv). But the primary, and obvious, non-fiscal measure to be taken is to create and maintain an infrastructure of strong IPRs.

Innovation drives productivity and economic growth. The trend to IP-driven economies grows worldwide. Chart 1 demonstrates not only the extent to which this is true, but how rapidly it is happening.

CHART 1 Charges for the use of intellectual property, payments, 1960–2015 (BoP, current US\$)



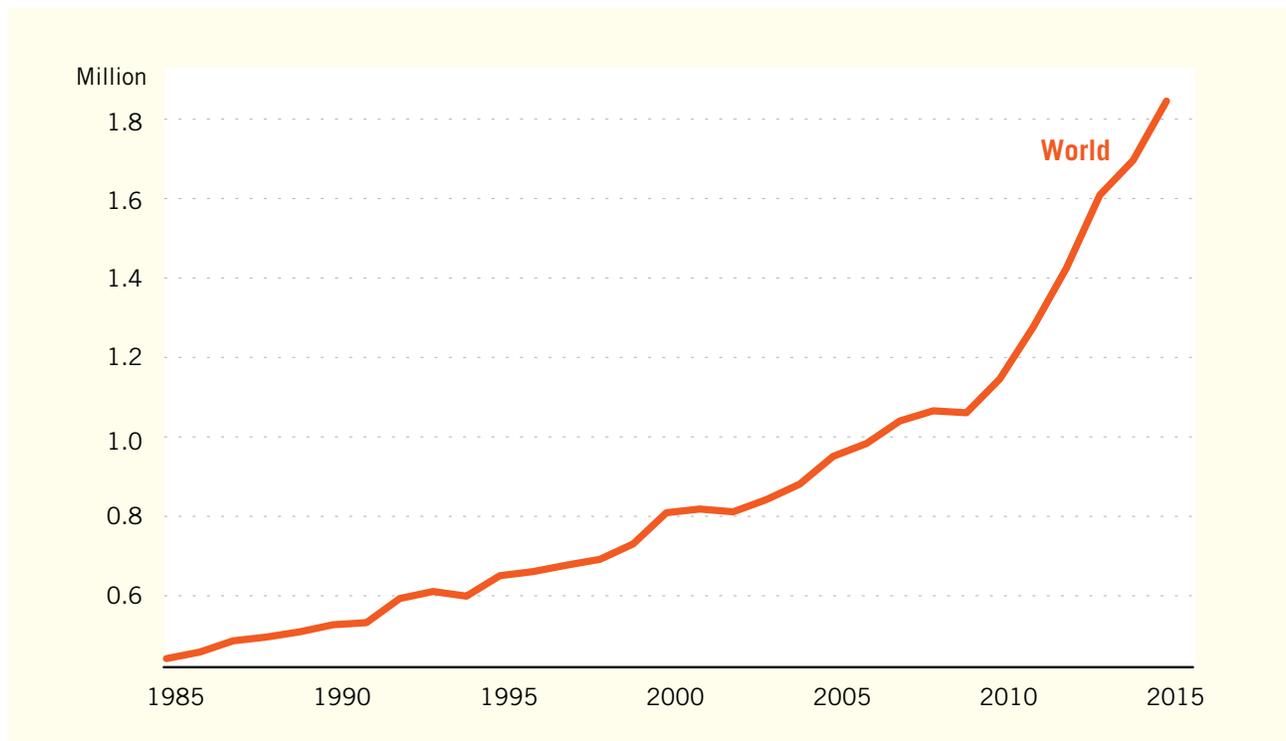
Source: World Bank n.d.-b.

It shows global charges for uses of IP, such as licences for manufacturing methods and products and rights to use trademarks and software, and how they have soared in recent years from under US\$50 billion in 1995 to more than US\$350 billion in 2015.

It is almost as though charging for IP were newly discovered in this millennium.

Consider also the escalation in the number of patent applications, globally, by country residents (as opposed to foreign filers)² in chart 2.

CHART 2 Patent applications, residents, 1985–2014



Source: World Bank n.d.-b.

Patent applications arise directly out of successful research and development. They are a sound proxy for innovation generally, as well as a direct measure of IP growth.

The urgency of addressing IP laws in Canada comes from its lagging position in productivity and innovation. Canada is being left behind in the race to reap wealth from technology. According to the World Intellectual Property Organization (WIPO) Global Innovation Index (GII) (Dutta, Lanvin, Wunsch-Vincent 2016), Canada is in a middling position; comfortably in the top 25 innovating countries but well away from the top – in a similar position, it should be noted, to its ranking for IP law strength in a similar index, the Global Intellectual Property Index.³ In the GII, Canada ranks in 15th position. The US ranks 4th. Why the discrepancy?

“Canada was almost alone among the G20 in seeing a substantial decline in R&D spending between 2004 and 2014.”

Moreover Canada has been in steady decline in GII rankings (36). And according to OECD (2016) data, Canada was almost alone (with South Africa) among the G20 in seeing a substantial decline in R&D spending between 2004 and 2014. By the number of patents filed relative to its population, Canada gets a dismal “D” grade from the Conference Board of Canada (2013). So, there is work to be done. The IP provisions of recent trade treaties – the Comprehensive Economic and Trade Agreement (CETA)⁴ particularly, and to a lesser extent the TPP⁵ – themselves point to some of the ground Canada has to make up.

What is IP?

Once arcane, IP has become a hot topic in the age of the Internet. Increasingly technology touches nearly everyone, and everyone seems to have opinions about IP laws. But to a large extent, these opinions are of little value; IP is deep and complex, and few have studied it long enough to truly understand its development and meaning. Holistically, IPRs, although consisting of various rights with different sources, rationales, and histories, are elegant. This elegance is comprised of IPRs’ unique and often quirkily precise conformity to theory and practical necessity. It is an elegance critics and even courts often fail to observe and respect.

That IPRs display such elegance should come as a surprise to no one. IPRs have been refined over centuries by clever minds, cogent economic logic, moral intuition, and the unremitting discipline of markets. These factors alone should give serious pause to anyone considering reducing them. A legacy as finely tuned and rich as is our IP jurisprudence and statutory law ought not to be treated lightly. However, perhaps out of a sort of misguided millennialism, the prevailing fashion in IP commentary

is disruption and reversal, when it should be appreciation and refinement. Like so many areas of human endeavour, IP clearly demonstrates the value of truly conservative thinking. In saying so we do not mean to ally ourselves with stagnation – far from it – but rather preservation, an approach that proceeds from a genuine and deep appreciation of our antecedents and heritage before urging that they be replaced.

“A legacy as finely tuned and rich as is our IP jurisprudence and statutory law ought not to be treated lightly.”

IP broadly describes intangible products of the mind in which property rights are legally established. There is no IP protection, *per se*. To be protected, a product must fit within one of the pre-existing IP pigeon holes. These are not a system,

in that they are not interlinked or made consistent with one another. Each one is what it is. The most common forms of IP are: patent, copyright, trademark, and trade secret, but certain unique forms also exist, such as plant variety protection, integrated circuit topographies, and *sui generis* database protection.

This paper is not limited to industrial innovations covered by patent law, although that might make our task easier. Increasingly copyright also has important economic impacts and it would be wrong to omit it (and as we will see in the next paper, Canada’s trade in copyright-protected goods is strong and important). WIPO (2015, 15) points out how much more important copyright has become to innovation. Not only artistic and literary production, which are covered by copyright, are economically significant but also computer software and games, which are so important to the Canadian innova-

tion economy. For instance, in 2015, for gaming alone, 472 development studios contributed over \$3 billion to Canada's GDP (Entertainment Software Association of Canada 2015).

It is incumbent on every discussion of IP to first say a little about just what IP is. To better appreciate the arguments and studies set out below it is essential to have some understanding of the classes of IP. So, we forthwith fulfil our obligation to inform.

Patent

Patents are issued under the *Patent Act* (Canada) (responsibility for IP in Canada is federal, *Constitution Act, 1867*, s.91). A patent is a government-issued monopoly to make, construct, use,

or sell an invention. An invention must be new, useful, non-obvious, and inventive. It must be something truly useful – a mere scientific discovery or abstract theorem will not qualify. It must be something that would not be obvious – not to you or me, but to an expert in the relevant field. And it must be reduced to practice – that is to say, made to function.

The application for a patent must not only fully disclose the invention but also how best to implement it. This is what is referred to as the *patent bargain*; in exchange for the patent, society has full and free access to information concerning the invention. It is a good bargain. Scientific knowledge is increased, as it would not be if the invention were kept secret. The inventor or owner of the patent is given a strong incentive to commercialize it for the benefit of society. This patent bargain is often recited as a tired justification for patents when, in fact, it is the very armature around which our innovation economy revolves.

Absent this patent bargain there would be no incentive to disclose inventions – the incentive, in fact, would be to keep them secret. A moment's thought would reveal that any general requirement to disclose inventions for the general good would be unfair and unenforceable. In this light, patents are a uniquely effective and appropriate mechanism to advance technology R&D, bringing into daylight the fruits of scientific research and development.

Patents may be issued for inventions made in any field of endeavour. They are not to be issued, according to the *Patent Act*, for any “mere scientific principle or abstract theorem”; nor, pursuant to a common law exception, may they be issued in Canada for methods of medical treatment (*Tennessee Eastman Co. et al. v. Commissioner of Patents*). There are other “subject matter” exceptions, including “higher life forms”.⁶

A patent lasts 20 years from the date of filing. Once filed, a patent application is examined on behalf of the government by experts. A patent office examiner goes over the application and tells the inventor, or her agent, all the reasons that the application should be cut back or fail altogether. There follows productive back and forth argument, which results in a patent application of just the right scope, one that claims exactly what was invented and no more. This is a costly and time-consuming process. Before the monopoly receives government backing, examination on behalf of society is thorough.

The result is that the application is eventually sealed with a nice red seal and issued as a patent. And even then the process is not over; a significant number of patents are subsequently invalidated in litigation with alleged infringers. An infringer is someone who does without permission what only the patentee is permitted to do – to make, construct, use, or sell the invention.

The key to a patent is its numbered claims, which precisely define the scope of the monopoly grant-

“ In 2015, for gaming alone, 472 development studios contributed over \$3 billion to Canada's GDP.”

ed. Subject to certain rules of interpretation, the words of a claim are the “metes and bounds” of the monopoly.

While patents are meant to treat all technologies the same, special rules apply to one class of inventions – pharmaceuticals. The origin of this special treatment is in the very complex and expensive regulatory approvals process every drug must go through before it is sold, and in the fact that the generic drugs industry is typically ready to pick up and manufacture profitable drugs when the patent expires.

In some countries pharmaceutical patents can be extended for a period of years to compensate for regulatory delays (this is not yet the case in Canada).⁷ Furthermore, generic manufacturers are prevented from relying on information filed by the original manufacturer to qualify the drug for sale, to qualify their own subsequent generic versions, for a certain time. This information may include safety and clinical trial data. Either the generic manufacturer must develop its own data, or wait until the exclusivity period is over to rely on pre-existing data created by the drug’s originator to qualify its version for sale.

Copyright

Copyright is protected under the *Copyright Act* (Canada). Unlike patent, copyright confers no monopoly, nor does it protect ideas or information. Copyright protects expression of ideas – form, not substance. Copyright protects only what is original and expressive in a work (*work* is a term used in the *Copyright Act* to refer to a product that could attract copyright protection, be it a poem, a contract, a novel, a photograph, computer software, cinema, and so forth). Copying is restricted, but protection of that original expression is not absolute. Anyone is free to come up with exactly the same work so long as it is not copied from the protected original.

Unlike patents and trademarks, there is no need to register a work for it to be protected. Protection arises automatically on creation. Registration is possible, though, and there are legal benefits to it.⁸

Copyright provides several legally protected rights set out specifically in the *Copyright Act*. First amongst these, of course, is the right to copy and to authorize copying, but also included are, for instance, rights of translation, performance, telecommunication, publication, and rental. All of these

rights have been subject to considerable, and not always salutary, judicial interpretation that has shaped interpretation of the *Copyright Act*.⁹

“ Considerable scope is allowed for permitted copying of a copyright protected work. Many parts of a work might not be protected at all.”

These rights are subject to numerous exceptions. Considerable scope is allowed for permitted copying of a copyright protected work. Many parts of a work might not be protected at all. Their inclusion in a protected work doesn’t change that, and they may be freely copied. If a work includes copies of material already in the public domain, or portions that are not very expressive (either for the author’s failure or because the subject matter admits little variation in expression), then they are not included in the

scope of copyright protection. These may be freely copied. So too may any insubstantial part. So too can substantial parts be copied if the copying qualifies as *fair dealing*, which is dealing, for instance, for the purposes of news reporting, criticism, education, satire, parody, or private study (in the US the corresponding, and perhaps more familiar, term is *fair use*.)

A functional, as opposed to purely aesthetic, work protected by copyright is computer software. Soft-

ware can be protected by trade secret, patent, and copyright all at the same time, and many find this confusing. Some argue that as a functional product it shouldn't be protected by copyright at all, but it has long been expressly included in the *Copyright Act*.¹⁰

The *Copyright Act* also includes so-called *moral rights*. These are rights to the integrity of the work and not to have it used in a manner that reflects badly on the artist. The existence of moral rights highlights that society recognizes more than mere economic value in copyright-protected work, it recognizes also the continuing interest of an artist in her personal self-expression. Moral rights can be waived but not assigned.

Trademarks

Patents and copyright have the biggest impacts on innovation and accordingly the greater focus of this paper is on these, and primarily patents at that. But trademarks are nonetheless critical IP and they require thorough protection. Poor protection of trademarks can result in widespread trade in counterfeit goods – not only handbags and DVDs but safety-critical products like electrical equipment, hardware, and electronics. Strong trademark protection is important.

A trademark is an indication of origin for goods in trade, indicating “we made this, and you can trust our reputation for quality”. Unregistered trademarks exist at common law and are protected within their geographic region of use, but registration under the *Trade-marks Act* (Canada) is the best practice as it grants national rights. To be registered a mark must be distinctive and comply with the many requirements of the *Trade-marks Act*.

To slightly complicate matters, an original and expressive trademark design might also be protected by copyright.

A recent report from the OECD (2017b) highlights the extremity of the problem of the trade in counterfeit goods, and listed Canada as a leading source of such goods. This is a major irritant in trade with the US and others, and it needs to be addressed (Curry 2017).

Trade Secrets

A *trade secret* is confidential information of commercial value. To be protected its owner must carefully guard its secrecy with confidentiality agreements and sound security procedures because once the secret is out, protection is gone. Trade secrecy is only enforced against those with an obligation not to exploit or reveal the secret, not the world at large, a key difference from patent and copyright. Trade secrecy will protect IP not covered by patent law; for instance, fine tuning of a patented process where the improvements are not themselves patentable. Some patentable products, like software processes, are sometimes not patented and protected only by trade secrecy because a patent on them would be too hard to enforce, and the disclosure required by patenting would facilitate copying. Any invention within the meaning of the *Patent Act* would, if not disclosed or patented, qualify as a trade secret.

Trade secrets are a complement to patent law, but their effects are uneven depending on the type of technology to which they are applied. Some products make evident the secrets that helped produce them, willy nilly. The efficiency of trade secrets is an adventitious artefact of the type of technology and its application, not of need or utility – hardly the basis for sound IP policy.

Moral and Philosophical Support for Intellectual Property Rights

Why intellectual property rights are property rights

This study focuses on the economic impacts of IPRs, but IP laws are powerfully justified by more than economics. They have right on their side. It is out of respect for the power and uniqueness of human creativity, too, that we allow the author or inventor to control and benefit from her work. Arguments from philosophical and moral values greatly firm up the IPR foundation, augmenting utilitarian necessity with principled belief.

Work protected by copyright is often artistic. The artist deserves protection and control of her work for its intensely personal nature. It is her speech, in effect, her statement. This is why copyright law

“IP laws are powerfully justified by more than economics. They have right on their side.”

not only bestows economic rights but also extensive control of the work by the author. It establishes moral rights, which protect the reputation of the author and the integrity of her work.

In patent law, too, an invention is the product of the personal labours of the inventor, although we do not treat inventions as quite so intimate to the inventor as works are to authors (see below).

John Locke is widely cited as providing a philosophical support for IP (Burk 2012). According to Locke’s “labour theory” of property, ownership comes about by application of labour to create enhanced value, entitling the creator to the

product of her work (Merges 2011). Locke’s theory is useful as far as it goes, but it must be noted that labour is not in fact at law protected or respected in patents or copyrights (*Tele-Direct (Publications) Inc. v. American Business Information, Inc.*; *Feist Publications, Inc. v. Rural Telephone Service Co.*). Rather it is something more that is demanded of the beneficiaries of IPRs – originality, skill, and judgment, in the case of copyright, and the magic spark of invention, in the case of patent. No matter; “creative spark” stands in perfectly well for “labour” in the Lockean equation, which seems to be as much about equity as it is philosophical formulation. Regardless of the intellectual specifics underpinning a view of the fairness and rightness of IP, instinctually we feel that it is just that those responsible for creative or inventive labours be entitled to the rewards of those labours.¹¹

Values underpinning IPR laws include individual autonomy and freedom, important Kantian principles. For Kant, the ability to work and shape is a key impulse for humans. While a continuous possession is not always practical, especially if the object is intangible, the concept of possession is essential to human freedom, even with respect to knowledge and ideas (Moore and Himma 2014). For both Kant and Fichte, the creator had a strong moral right to her work that supported also an economic right (Pozzo 2006). Hegel likewise argued the importance of IP to self-actualization, and the strong moral claim to the objective expressions of our personalities in the world (Rauscher 2016; Fisher). Indeed, for Kant, “an author’s interest in deciding how and when to speak [is] an inalienable part of his personality,” – and he thus felt that it should not even be assignable (Fisher).¹² John Rawls also considered IP rights to be fundamental (Shiffrin 2010; Merges 2011).

Courts typically draw on a mix of theories in sustaining IPRs, including those cited herein and utility theories (Fisher). But according to Robert Merges (2011), courts in the US are shifting their discus-

sions of IPRs from a means of social utility maximization to discuss them instead as fundamental rights in the fullest sense.

There is a tendency among IP academics to disparage the value of human creativity. This is to build an argument against the importance and justice of IPRs. The argument runs that creative effort is not all it is cracked up to be, that it all depends to some extent on cultural antecedents and therefore IP protection is an excessive reward. How this view is squared with the astonishing creation of a new poem or computer game or pharmaceutical or novel leaves one to scratch one's head.

In any event, whatever the true value of human creative genius – and we believe in it passionately – the argument is simply irrelevant. This is because of the nature of copyright protection. Aspects of a work that obviously draw on common antecedents simply will not be protected to the same degree as more original aspects of the work. In no case does copyright law hinder anyone from relying on the same precedents. Work divinely inspired, on the other hand, will be well-protected. Besides, lawyers and legal academics do not really know much about creativity, and their pontification counts for little.¹³

Utility

IP is what economists call a *public good*. Public goods are non-rivalrous and non-exclusive; that is, many people may possess such goods at the same time, without anyone's possession interfering with another's. How, then, to encourage creation of such goods, and trade in them? Here even we must argue for the intervention of the state; the problem leads ineluctably to the need for legal infrastructure. The solution is legislated property rights.

Different utilitarian theories link IP, and particularly patents, to innovation and growth. Of them, the *invention inducement theory* or *incentive theory* is the most prominent. The incentive theory assumes that without the opportunity for control over a new technology – or some alternative incentive – there would be little motivation for individuals and firms to invest in R&D. The same can be said of the creation of copyright-protected goods.

Alternatively, *disclosure theory* argues that a patent system is necessary to induce inventors to disclose their innovations, adding thereby the benefits of technology diffusion (Burk 2012). In this theory the focus is more on the public good that arises from disclosure, rather than the rights and autonomy of the inventor. From a practical perspective, disclosure theory is a critical insight into the importance of patent protection. Without it, only trade secret law would protect inventions (to the limited extent it can) and society would be poorer for want of the knowledge contained in patent disclosures. Indeed, if there is a flaw in the patent process it is that the need for disclosure discourages filing some patents, particularly where enforcement is expected to be difficult (take, for example, a loan application evaluation algorithm, use of which would be hidden on a secure, proprietary server, thus evading a patent-holder's scrutiny). Patent protection needs, somehow, to become even stronger.

Development or commercialization theories, on the other hand, see IP as a means of reducing costs to investors, and allowing for inventions to be marketed. Under this theory, IP law turns inventions into assets that can be sold, licensed, developed, used as collateral for financing, and otherwise distributed through the marketplace.

The *prospect development model* is an amalgamation of others. In Edmund Kitch's view, strong IPRs are needed both to give the original inventor the incentive to invent, disclose, and market her invention, and to develop improvements to maximize its value. Kitch's intention was to align the law and economics view of IPRs with prevailing economic theories of property – it was called prospect development because it was seen to be not unlike the rationale of granting mineral claims to prospectors to develop (Burk 2012).

Next up is *transaction costs analysis*. This is a microeconomic theory of the effects of IPRs, developed and expressed by Arora and Merges (2004). Transaction costs analysts believe that the size and structure of firms is dictated by the transaction costs involved in their businesses, and that IP may be an important means of keeping transaction costs low. All things being equal, it is theorized that firms will vertically integrate and expand when market transactions are costly. If this is the case, they will begin to make their own inputs to production. If costs of market transaction are low, they will tend to shrink, outsource, and specialize (Burk 2012). Patents can lower transaction costs for firms by providing secure property rights in their inventions, and safeguarding smaller firms from strategic behaviour by larger firms. Thus, a robust patent environment fosters vertical de-integration and small firm specialization (Arora and Merges 2004). Barnett (2011b) argues that this promotes efficiency, as R&D and innovative activity are better separated from downstream manufacturing processes, and each stage in the production process is better executed by specialized firms. A 2015 study by WIPO, “Breakthrough Innovation and Economic Growth”, demonstrates the importance of this effect for several emerging technologies, including nanotechnology, aviation, and 3D printing (beginning on page 14).

Finally, patents have important signalling effects. A number of studies (Hoenen et al. 2014; Heeley, Matusik, and Jain 2007) demonstrate the value of a patent portfolio to investors and its positive impact on the cost and availability of capital.

Counterarguments

Alleged inefficiencies

As in other fields of human achievement, naysayers, doubters, detractors, and other nabobs of negativism clutter the ideascapes of IP with a range of perspectives from well-considered (if wrong, or incomplete) economic arguments, to radical critiques infused with quasi-millennarian intoxication (also wrong).

Some argue that the interests of producers and consumers of IP conflict, particularly in the short term. When producers use their rights to exclude would-be consumers from use of their creations, the effect is to restrict supply, which results in higher prices and thus a transfer of wealth from consumers to producers (Putnam and Tepperman 2011). Some consumers who may have otherwise used the innovation will make an economic choice not to. This represents what is called a “deadweight loss” for society, as no one benefits from such choices (Putnam and Tepperman 2011; Rockett 2010).

Admittedly, the observation that things cost money is hardly a profound policy insight. Moreover, the scope of the alleged “deadweight loss” is narrow, if it exists at all. Suppose, for instance, the impecunious consumer balks at the price of the latest Dan Brown best seller and opts instead for a free e-book by Kant or Nietzsche, or playing Frisbee football for exercise instead. How can she be said to be worse off reading original and deep thought instead of derivative nonsense? The fact, then, is that the consumer’s loss is never absolute, or even sure; she will do something with her time or attention, as there are plenty of alternatives.

It is also argued that transaction costs minimization for consumers of patented technology helps mitigate deadweight loss (Merges 2011). This also seems self-evident and is essentially an argument for a more efficient market. But the implicit assumption that government interference is necessary is wrong – beyond, that is, crafting an effective, legislated rights framework in the first place. Mar-

kets are effective and efficient in allocating scarce goods and creating effective incentives to reduce transaction costs.

A further problem with this deadweight loss argument is that it fails to account for consumer gains from the existence of a commercial market for IP-protected goods. Put another way, it takes the existence of IP for granted, and implicitly assumes the monopoly over it to be a policy option. But IP doesn't exist in some ubiquitous ether, free for everyone to grab as the mood suits them. It must be published, built, marketed, and distributed. These are all services that would not be available without the existence of exclusive rights that allow authors and inventors – and agents and manufacturers and publishers – to appropriate some of its value.

To what extent does the high consumer utility of commercialization offset the requirement to pay a price for the use of IP-protected goods? It is hard to quantify, but it would exceed the absolute social value of the invention/work less aggregate prices paid, since information and ideas benefit society even where each individual does not acquire the work, or a licence to it. The existence and awareness of a good that may be difficult to afford is vastly better than a situation in which the good did not exist and were not available in the first place as it would not be without adequate IP rules. Without patent rights people with inventions will either keep them secret, robbing the common store of knowledge, or fail to invent because of lack of incentives, resulting in – yes, a deadweight loss to consumers and society. These deadweight losses would be far greater than those attributable to the role of IP in creating the right to exclude deadbeats from use.

The market provides strong incentives to discriminatory pricing, which IP allows (perhaps this is one of the few instances in which the word “discriminatory” is used favourably). This means that producers have incentives to reduce prices where possible to reach a wider market. With IP, low marginal costs of production generally allow wide scope for such pricing. Thus, for instance, one may buy a movie on Blu-ray, or for less money on a DVD, or less still by downloading it, or still less by streaming it or holding it for a limited time. Drugs may also be priced differently in different jurisdictions. Discriminatory pricing contributes to market efficiency and minimizes deadweight loss.

For copyright-protected goods, control of publication and distribution is an aspect of their creative expression, and an incident of the right of publication. It is not all about economics. These rights are not only whether to make a work public, but also how, in what form, and on what terms. In other words, market exclusivity is not the sole motive behind the rights granted, but also there are motives of personhood and creative freedom. These motives may greatly affect cost or ease of access to consumers, but are completely consistent with the values behind copyright.

It should also be noted that the above analysis of deadweight loss and economic costs represents in any event only a short-term conflict between the rights of producers and interests of consumers. Consumers, while alleged to suffer a loss in the short run from strong IPRs, will, it is said, benefit in the long run as the price of patented technology falls and inspires further innovation (Putnam and Tepperman 2011). This is true also, generally, of copyright-protected goods: expensive on first release, but prices fall with time. Again, though, price reductions likely reflect value reductions too. Value reductions may occur with superseding inventions, for instance. So the weight of argument

“ Consumers, while alleged to suffer a loss in the short run from strong IPRs, benefit in the long run as the price of patented technology falls and inspires further innovation.”

falls primarily to the inspiration of further invention more than declining price in the case of patent inventions. This is less likely to be true of copyright-protected goods. Old video games may be less valuable because of their slower, less graphically-detailed technologies; novels or poems or music downloads/CDs may be reduced in price as they slide from the bestseller lists – but their intrinsic value has not changed.

An efficient patent system is said to be one that minimizes transaction costs to consumers and those who use patented or copyrighted works as inputs into their work, while at the same time maximizing autonomy and incentives for rights owners. This is the optimal balance that policy-makers need to strike, although the criteria are in irresolvable conflict. In attempting to strike any such balance it is far better to err on the side of extensive rights. This is because value – the ability to charge a high price – cannot be prolonged past what the market assigns. The unexpired term of a patent-protected device that has been superseded by a superior or cheaper competitor will have little impact on its price. But contrariwise, value can be lost by insufficient protection – say, a still-popular drug going off-patent. When this happens, value inherent in the invention is not recouped by the owner. Moreover, a period of protection too short may require pricing, to recoup investment in R&D, to be unrealistically high. In other words, it has dramatically different implications for the consumer if a billion dollars of development costs for a drug is recouped in five years or 20.

All this is to say that patent duration and patent value do not necessarily equate and indeed, may be theoretically unlikely to; in a majority of cases value will dwindle prior to the expiry of the patent (it is generally said that 95 percent of all patents prove to have no value at all, anyway. Patenting is a high-risk game.).

Patent laws ought not to offer terms that exceed the level of incentive necessary to ensure, if not the maximum level of innovation, something close to it. What is that? No one knows exactly, but the current 20-year term is probably a pretty good average of what the many fields of inventive technology require. The only area in which that duration has been truly tested and fine-tuned is pharmaceuticals, with respect to which governments acknowledged that the patent term remaining after regulatory approval was insufficient to sustain the massive R&D necessary to produce drugs, so terms have been adjusted (Canada has yet to fully follow suit). Where further data indicate the patent term to be insufficient for some field of invention, other extensions may also prove advisable.

Political critiques and developing risks

It also seems that IPRs are subject to reflexive, political critiques from both right and left. The critique on the left is fundamentally anti-property and anti-elite (for “elite” read creators, inventors, and authors); on the right, a mistaken antipathy to government grants of monopoly.

“ The critique on the left is fundamentally anti-property and anti-elite; on the right, a mistaken antipathy to government grants of monopoly.”

The critique from the right errs through a lack of perspective and understanding. Copyright, first, is not a monopoly and is not so much granted by the state as acknowledged, if one were to take a Lockean perspective; the work is purely of the author’s making and removes nothing from the commonwealth, making the limited exclusive rights granted (remember, copyright is not a monopoly) unobjectionable as such. Patents are monopolies, but their great utility easily overrides any negative aspects of state support, especially since absence of a patent grant will often only result in a monopoly anyway, but one sustained by trade secret instead of patent law. Such critics should support markets, but without IPRs there can

be no market for IP-related products. It is more accurate to consider the creation of a limited property interest than a state grant of monopoly.

A properly informed critic from the right sees her arguments vanish.¹⁴ In all types of IP the subject matter of the claim would not exist but for the creative efforts of the claimant. Philosophically, we can easily see at least two consequences arising from this basic fact. The first is that the idea that IP deprives the public commonwealth of anything is false, since the full extent of the property protected by IP law was never a part of any commonwealth but always proprietary, and for that matter entirely at the discretion of the claimant to conceive and to make public. Secondly, since the IP is generated entirely by the author, in the case of copyright, or the inventor, in the case of patent law, the justice of the claimant's claim to ownership and control is ineluctable. It is often argued too that monopoly over information offends freedom of speech and of the press. This is a complete canard. It cannot be overemphasized that neither copyright nor patent create any right of control over the flows of information. The opposite is very much the case. It is argued, too, that the state ought to enact no coercive law where individuals can bargain by private contract. But this argument simply ignores the complete inadequacy of public contract to deal with "public goods" – goods which, being non-rivalrous and non-exclusive are too freely appropriated without, even, depriving any lawful owner of them, since they are so easily copied.

Where the left errs, on the other hand, is in its doubt of the value of market transactions and the importance of clear property rights. The left seems to seek a specious sort of equity that favours users over creators, which seems in turn to be based on the idea on the left that IP is appropriated common property.¹⁵ But as discussed above, IP is never common property – that is, until legal protection is lost and it enters the public domain. It has to be created before it can be put into a commons; it is never drawn from one. Thus the left has it entirely backwards. It is not that the public domain is deprived by IP, but rather that it is increased by the creation of IP.

Another aspect of the left's critique, which is often technocentric (Merges 2015), is that IPRs interfere with Internet users' and other artists abilities to make mash-ups and avail themselves of other creative opportunities arising from the digital revolution. This argument may be seen to be represented, for instance, in Professor Geist's (2007) support for Canada's new "user-generated content" provision in the *Copyright Act* (s.29.21), a provision which encourages just such infringing mash-ups. It is, however, unreasonable and wrong to base copyright policy on the ability to create works that are infringing and derivative. This is akin to the argument that the advent of cyberspace, with its vast and instantaneous flows of information, is only disrupted by, and hostile to, IP. In fact, of course, the opposite is true; intellectual creation has become so much more important to society that IPRs' value increases proportionately.

Jim Balsillie and Professor Geist each in his own way argues for weaker IPRs tailored to Canada's specific needs – their parochial fallacy. These arguments seem to flow from no dogmatic position on the left or right but might best be characterized as tending left. Both seem to want weaker IPRs for Canada. Their arguments seem in part to be based on their belief that Canada is in a trade deficit position in IP-protected goods and services.¹⁶ Otherwise, why Canada's needs should differ from international IP standards is far from clear; so too, how IPRs might better be tailored for Canada. Mr. Balsillie further seems to argue that strong IPRs help foreigners more than Canadians. Essentially, Mr. Balsillie's (Castaldo 2016; Geist 2016b; Balsillie 2016) and Professor Geist's (2016b) perspectives are more statist than market-oriented. Theirs would be a more managed IPR regime, one responsive to the nuances of their views about what Canada needs, a risky proposition indeed. These arguments are more fully dealt with in the next paper.

Anti-commons

New technologies often aggregate together several patented technologies. An iPhone in 2009 contained 200 patents (on the chips, antenna, and microprocessors contained within, for instance) not

including the patents owned by outside entities that had to be licensed by Apple before the iPhone went to market (Gilroy and D'Amato). Some have argued that multiple entities holding patents on technological inputs to new inventions could hinder subsequent innovation, particularly in the field of biotechnology (Heller and Eisenberg 1998). This has been dubbed the *anti-commons effect*. The anti-commons effect comes about when either one or more of these external patent holders refuses to allow its technology to be licensed by a subsequent innovator, or the transaction costs attached to numerous licences become prohibitive, thus jamming up the innovation process and preventing firms from bringing valuable technology to consumers.

These fears are grossly overstated. After a comprehensive survey of innovators in the patent-heavy biotechnology field, Cohen and Merrill (2003) conclude that “the vast majority of respondents say that there are no cases in which valuable research projects were stopped because of IP problems relating to research inputs.” Studies have shown the anti-commons effect to be far more theoretical than real – and theoretically unsound, at that (Cohen and Merrill 2003; Heller and Eisenberg 1998; Kitch 2003; Epstein and Kuhlik 2004; Walsh, Cho, and Cohen 2005; Burk 2005). A study by the WIPO (2015) of several key areas of developing technology is careful to point out the absence of the anti-commons effect.

The existence of the anti-commons is a bizarre argument on its face, given that the “commons” of known IP only exists because of IPRs, without which it would be undisclosed or at least much less would be available. Thus so-called *patent thickets* are at worst a sort of secondary problem – one cannot share what does not exist in the first place. Moreover, the idea of a patent thicket is misleading. All patents create transactional hurdles and costs – because they make inventions available in the first place. It is not like patents are an option without which the same richness of invention would present itself. Moreover, the extent of transaction costs is a linear effect increasing evenly with the number of patents. No particular number becomes a thicket.

Current challenges

It is also important not to give credibility to the anti-commons, since it appears to be a part of the justification for the so-called “patent reform” movement, a “reform” akin to Stalin’s reform of land-holdings albeit, admittedly, less overtly consequential.

Recently, a number of large technology and software corporations in the US have come out in favour of relaxed patent laws, which they claim will stymie the tide of “frivolous” patent litigation (remember that small firms litigate more than larger ones) and lower the transaction costs of doing business. Opposition to this view is typified by the American Innovators for Patent Reform, a non-profit group composed of patent owners, inventors, executives, lawyers, patent agents, and entrepreneurs, who claim that “big tech’s” recent turn towards looser IPR regimes is simply an attempt to make it more difficult for start-ups and individual innovators to assert their intellectual property rights, and thus easier for larger firms with easier access to capital and commercialization capacity to outmanoeuvre them and steal their innovations without fear of legal sanctions.

This is important for Canada because it is part of the anti-IP discourse. We must not let it be influential here; it will harm our innovation system of smaller companies.

A defence of IP is timely also because its protections are at risk of erosion in courts and legislatures. The Canadian legislature has, in a recent round of *Copyright Act* amendments, introduced changes that markedly devalue the protections of that *Act*, for publishers, musicians, and others. Many, many more exceptions to the protections of the *Copyright Act* were added in the recent round of amendments (*Copyright Modernization Act* S.C. 2012, c. 20). The policy vision of the federal government needs to better internalize the interests of Canadians.

Also challenging to IPRs are activist courts, pushed by emerging commercial, and state, actors, such as Google and even the US government. A growing number of cases illustrates this trend. Consider cases involving Google in the United States (these are important in part because US technology and IP cases influence Canadian courts). These include the infamous Google Books case (*Authors Guild, Inc., v. Google, Inc.*), a case in which Google was determined to be using works fairly by copying the entirety of them and putting them in a database for partial viewing on line, with no compensation to authors, and *Perfect 10, Inc. v. Amazon.com, Inc.*, in which Google gained the power to present thumbnails of any image on the Internet without permission or compensation. At the root of these cases seems to be deference to Google's activities being in the "public interest" – a component of fair use legal doctrine applied particularly in *Perfect 10* but turned to broad account to grant plenary absolution for massive copying. Also noteworthy is the US government's position in *Myriad Genetics*, in which it successfully advocated for narrowing DNA patentability (*Association for Molecular Pathology v. Myriad Genetics*).

Nor has the Supreme Court of Canada (SCC) advanced the cause much. Indeed, in a subsequent paper we will argue that steps need to be taken to increase the IP capacity of the SCC. In its celebrated copyright pentology, the SCC consistently curtailed the protections of copyright (*Society of Composers, Authors and Music Publishers of Canada v. Bell Canada; Re:Sound v. Motion Picture Theatre Associations of Canada; Rogers Communications Inc. v. Society of Composers, Authors and Music Publishers of Canada; Alberta (Education) v. Canadian Copyright Licensing Agency (Access Copyright); Entertainment Software Association v. Society of Composers, Authors and Music Publishers of Canada*). So too in the earlier case *CCH Canadian Ltd. v. Law Society of Upper Canada*, a case in which the SCC decided to allow a library to freely copy materials for lawyers. Meanwhile the court has stoked a trade war with its rulings on patent utility¹⁷ and brought into question the whole scope of patent law in its fear of the Harvard mouse (*Harvard College v. Canada (Commissioner of Patents)*).

Further aggravating the weakening health of IP in Canada is a primarily contrarian IP professoriate. This problem of the academy is also more fully discussed in the next paper.

The Benefits of Strong Copyright Protections

Studies of the links between IPRs and economic outcomes often fail to distinguish between copyright and patent, or instead focus solely on patent systems. However, copyright law plays a critical role as well in stimulating innovation in various creative industries, such as publishing, recording, software, electronic games, movies, and many others (Handke 2011; International Intellectual Property Alliance. 2016).

As with patents, it is argued that there is a trade-off between the rights of copyright holders and the rights of consumers. The literature and jurisprudence suggest that the copyright system balances the interests of rights holders in maximizing the returns on their creations with those of end users, who pay higher access costs when copyrights are more robust. This argument runs, then, that costs to users (and creatives who use copyrighted works as inputs to their own works) need to be balanced against the incentive effects of stronger copyrights.

The extent of such a trade-off is highly questionable in fact. First, commercialization of goods, for which copyright is essential, is of great value itself to the consumer and needs to be on both sides of the ledger. Availability of cultural goods and enrichment of public discourse by them are benefits in addition to that of the market presence of a good priced as the market dictates.

Second, the connection between expiry of copyright and lower prices on goods is at best theoretical.

Third, copyright protection is very “thin”, much unlike patent monopolies, so that other creatives are not limited at all by the existence of someone else’s copyright (*Computer Associates International, Inc. v. Altai, Inc.*). Artists need only not copy material portions of the parts of another’s work that are protected by copyright. As Barker (2015) notes, “copyright is only granted with respect to the expression of an idea, not in respect to the underlying idea itself. So in addition to competition from copies of their own work, a copyright holder faces competition from other expressions of the same idea”. Given that copyrights do not grant the same level of market power as patents, it follows that they will not produce the same level of deadweight loss that arises from monopoly pricing (Barker 2015).

Fourth, copyright-protected works are merely subjective expression and do not sequester a part of a limited, objective reality otherwise open to others to discover. The rights only apply to expression, which would not and could not exist but for the effort of the artist.

“ Patents are monopolies; copyrights are not.”

Finally, to allow plagiarism of unprotected works, one of the consequences of an absence of copyright and moral rights, is hardly socially desirable. And if IPRs are indeed fundamental rights, as Merges (2015) convincingly argues, copyright, by the personal and subjective nature of its subject matter, is especially so. Therefore, any justification for its limitation must be all the stronger.

In this light it is also worth noting that the European Court of Human Rights has considered IPRs as worthy of human rights protection (Geiger).

The reality is that the traditional view, set out by Justice Binnie in *Théberge v. Galerie d’Art du Petit Champlain Inc.*, is simply inadequate:

The proper balance among these and other public policy objectives lies not only in recognizing the creator’s rights but in giving due weight to their limited nature.

In crassly economic terms it would be as inefficient to overcompensate artists and authors for the right of reproduction as it would be self-defeating to undercompensate them.

In fact, while one is reluctant to criticize Justice Binnie, who was one of the more reliable IP judges on the SCC, his statement is wrong. First, to at least some extent, greater incentives give rise to greater quality and quantity of cultural products, and greater competition in the cultural realm would drive down individual rewards so that the likelihood of overcompensation is reduced, if not nullified. Of course, this leads one to ask what overcompensation may be – one may well be forgiven for thinking that the returns allocated by a free market are by their nature not excessive. And it is in this regard, finally, that the quotation is most egregiously wrong. Overcompensation is difficult. This is because any good, including a cultural good, only has limited value in the market. The demand for it, whether cinema, music, computer game, or book, typically will peak early – very early – in the copyright term, then tail off. If this is the case with a particular good, no one is overcompensated if the term lasts longer than the popularity of the good – the market will cease to sustain the same premium price over the cost of production anyway. Contrariwise, however, if the term of copyright were shorter than the popularity of the particular good, the artist is under-compensated for the enduring market power of her work. Thus to suggest that the two meet, as Justice Binnie does, at some perfect balance point is wrong; it is actually much more inefficient to undercompensate, technically, than it is to overcompensate, to speak from his “crassly economic” perspective.

Posner and Landes (2002) and Barker (2015) argue also that copyrights might prevent *overgrazing*, which according to Posner and Landes (2002) occurs when the commercial value is sapped from a creative work from repeated, unauthorized reproductions. The authors use the example of Mickey Mouse – if any individual or group could use the image of Mickey Mouse in the service of any endeavour, a) the public would rapidly tire of the character, and b) the image of Mickey Mouse would become “blurred” as “some authors [portray] him as Casanova, others as Catmeat”. In terms of the optimal length and strength of copyright protection, Posner and Landes (2002) suggest that, like trademarks, it should be possible to indefinitely renew copyrights, as this would reduce the dead-weight loss from rent-seeking behaviour by corporations seeking to extend copyright terms. (As a practical matter, though, unlimited terms are more efficient than renewals of term.)

It follows that militancy against the occasional extensions of copyright terms is misdirected. This militancy recently led to a US Supreme Court case arguing that the extension of the US period of copyright protection to life of the author plus 70 years was unconstitutional (*Eldred v. Ashcroft*). Similarly Professor Geist (2016a), has argued against the similar extension for Canada contained in the TPP.

Indeed, legislated copyright terms have been extended frequently. Under the TPP Canada would extend its term from the current life of the author plus 50 years to the already widely-adopted life of the author plus 70 years. Why would this be if there were compelling public policy reasons to limit them? The answer is that there are not, and that extensions of term occur in no small part because there is no strong and evident countervailing policy or intellectual position that disciplines the urge to extend.

It is time for an outright end to term limits on copyright.

Term limits are inimical to copyright, which protects only a core of original speech and which establishes no monopoly. Why limit an obligation not to copy such work? What is gained by releasing copyright-protected work into the public domain? Why encourage plagiarism, and the disrepute of our cultural treasures, by the lapse of moral rights?¹⁸ Why discourage active commercial distribution of older works? Why curtail rights in this particular type of property and not others?

Copyright-protected goods detract from no commons. Original expression that arises anew is the subject of copyright. No one is worse off because it is protected by copyright, except plagiarists or creators of derivative works – whose interests it is hardly good policy to advance. Attenuation of the property interest, therefore, by a time limitation is an unfair expropriation. If someone fashions a utilitarian good – a wooden salad bowl, say – the property interest never comes up for grabs. It is never nullified or expropriated by the state. Why ought this to be so for copyright-protected goods? Indeed, in this regard it is worth noting that different types of copyright-protected goods receive, practically, very different treatment. Paintings and sculptures, photographs and other types of object or print, maintain exclusivity through possession, but literary works and digital works have no such practical layer of protection. This violates the copyright dictum of technological neutrality (*Society of Composers, Authors and Music Publishers of Canada v. Bell Canada*).

““ No one is worse off because of copyright protection, except plagiarists or creators of derivative works.”

The details of a scheme to administer indefinite copyright are largely beyond the scope of this paper. But, it would not be impractical. Orphan work provisions allow for use of works where authors can-

not be found with whom to negotiate. Or, in cases in which no heir survived, a collective could take over receipt and distribution of proceeds, for instance, to arts institutions. Moral rights must also survive. (Readers of a previous paper [Owens 2016] will recall an author's angst at hearing an ice cream truck playing "Für Elise".) We have already dealt with the problems of long copyright terms in the context of current terms. Making them longer is only just and not difficult.

Of course, indefinite copyright would still be subject to legislated exceptions, such as fair dealing. A subsequent paper will examine the wasteful excess of Canada's fair dealing regime. With respect to the US equivalent of fair dealing, called fair use, Landes and Posner (1989) argue that an excessively loose fair use system would reduce revenues to artists and sap the incentive effects of copyrights. Really, fair use is not the limited exception to monopoly it is made out to be, but rather a comprehensive description of the reasonable activities of a user with a work at all stages of its existence. Understanding this, copyright law becomes much more sensible.

Measuring incentive effects

Empirical work on copyrights and economic outcomes is beset with measurement problems. While R&D spending can be a useful measure of technology inputs, measuring inputs into content creation is more speculative. Much creative input occurs "off the books" by individual artists, and the structure of creative industries is not as clearly defined as it is with formal R&D departments and tax credits. On top of this, measuring outputs is also difficult, as copyrights arise automatically, and no official directory of the number of copyrighted works exists (or could exist; the volumes are inconceivable). A final difficulty arises from the fact that the threshold for granting copyright is significantly lower than with patents. Almost all copyrights are without any, or any significant,

economic value, given that copyright applies to everything from a student's lecture notes to a computer game or encyclopedia (Towse 2013).

“ For every anecdotal driven hobbyist artist there is an answering Dostoyevsky struggling to pay his gambling debts.”

To measure the incentive effects of copyright also presents problems because the motivations of artists, authors, and musicians to produce work are less straightforward than those of a pharmaceutical company or tech start-up. Jessica Silbey (2014) concludes that some of the incentives driving artists and creative professionals include the cultivation of relationships with fellow artists, financial gain for the purpose of making more art – rather than as an end in itself

– and protecting their moral rights over their work. Nonetheless, artists too must eat and pay the bills; to suggest that money plays no incentive role is blinkered. For every anecdotal driven hobbyist artist there is an answering Dostoyevsky struggling to pay his gambling debts, or a Chekhov supporting his habit of philanthropic medicine. There is also the simple fairness of entitling artists to a return on their wealth-creating activities.

As Silbey (2014) concludes after interviewing dozens of scientists and creative professionals about the role that intellectual property plays in their careers, "the layers of corporate or business interests that dictate control and ownership over creative or innovative work exhaust artists and scientists." According to Towse (2013), most of the sparse research into the incentive effects of copyright seems to suggest that it is firms, rather than individual creators, that are incentivized by them. What this adds up to, however, is merely the fact that artists commercialize primarily through firms – by outsourcing, as it were – and hence the firms pay more attention to copyright minutiae than the

artists need to. They perform the copyright exploitation function on behalf of the artist. The artists are still wholly reliant on copyright for income; motivated by copyright, but at a remove.

Amongst the limited empirical evidence of the effects of copyright, Reynolds (2003) finds that, based on samples of 81–136 countries, there was evidence that the number of movies a country submitted to the Cannes Film Festival between 1965–2002 was positively and significantly correlated with the strength of its copyright regime (Reynolds 2004). Handke (2006) finds a positive effect of copyrights in the German recording industry.

The Benefits of Strong Patent Protections

We value inventions, and patent rights over them, differently than copyrighted works. No doubt inventors feel proprietorial about and proud of their creations. Yet patent law does not accord them the same control as copyright holders have over their works. Inventions do not express the intimate self as copyright-protected works often do. They are industrial property, not speech;¹⁹ ideas, not expression; substance, not form.

A reason patents are conferred shorter protection than copyright is that inventions appear to be less unique than copyrighted works. An invention is something made within a field of research, unlike a work, which is purely unique, subjective expression. Many others may be hot on the research trail of the same thing, which is never true with copyright-protected works. The need to be the first to file a patent is part of the incentive structure of patents. Second place gets you nothing. The “second inventor” problem is far more likely than a “second author” problem is in copyright law.

A patent is, on the other hand, a true monopoly, unlike copyright. All others are prohibited, by the existence of the patent, from making, constructing, using, or selling the invention without permission. There is no fair use; a licence is required for a third party to use the invention.

There is, however, no restriction on reverse engineering an invention to see how it works. Interestingly, because copyright protects software, a functional work, patent principles have begun to make inroads into copyright. Specifically, a right of reverse engineering has made it into the *Copyright Act*.

Remember chart 2, showing the great growth in patent filings? All those patents represent not only inventions but also concomitant gains in productivity, knowledge, efficiency, and consumer choice. It is often argued that the patent system is expensive. It is; but it effectively regulates and confines monopolies.

Is it all worth it? Yes. The dissemination of knowledge that would not occur without it is tremendous. Not only does the patent system allow information to be public, it actually collects and categorizes it and makes it available all in databases. We’ll never know for sure how much the strong incentive effects of the patent system allow us to benefit from the creation of wealth and technology which wouldn’t otherwise be; but it is safe to say it is a very large extent indeed.

Evidence That Strong IP Correlates to a Stronger Economy

Comparative indices

In part to assess the relative strength of national IP regimes and in part to facilitate measures of their impacts on innovation, multinational, comparative indices have been developed (indeed, the Macdonald-Laurier Institute is soon to add its own). Rapp and Rozek (1990) constructed an index of the level of national patent protection in a country on a scale ranging from 0 to 5 (RR Index). National patent regimes were ranked based on such factors as coverage of inventions, examination procedures, term of protection, transferability of rights, compulsory licensing, and effective enforcement against infringement.

The RR Index was among the first to attempt to comprehensively quantify IP rights for a large sample of different countries and measure their effects on growth. It established that strong patent laws were correlated with development, and that countries with stronger patent laws tended to experience faster rates of economic modernization. They determined that the advantage afforded by

“ Patents are monopolies, but often narrow ones that do not grant much monopoly pricing power.”

patents often amounted to no more than access to a competitive market, rather than the ability to price like a true monopolist (although patent holding firms could sometimes behave like monopolists in instances where the innovation in question creates an entirely new market). These are important factors to remember about patents. They are monopolies, but often narrow ones that do not grant much monopoly pricing power, for there are patented and unpatented competing products.

Gould and Gruben (1996) examined the effects of patent protection on aggregate economic growth at the national level using a modified version of the RR Index. They examined 95 countries between the period 1960 to 1980, on several determinants of economic growth. They found patents to be very significant. In jurisdictions boasting a mid-range level of protection, for example, moving up the RR index by one unit was associated with a 0.25 percent increase in the rate of economic growth. Gould and Gruben also found that openness to international trade was a key explanatory variable of how effective strengthening patent laws would be as a determinant of economic growth (Putnam and Tepperman 2011).

A pioneering empirical study on the link between a country’s level of patent protection and aggregate rate of economic growth was undertaken by Park and Ginarte (1997), who looked at an index (with a different scoring scheme than the RR Index) of patent protection and the economies of 60 countries between 1960–1990 (and subsequently extended their study to 2000).

The index that Park and Ginarte constructed to measure the strength of patent laws was employed in subsequent studies (Kanwar and Evenson 2003; Allred and Park 2007), and informally came to be termed the “GP Index.” The GP Index ranges from 0 to 5, and accounts for: 1) the extent of patent subject matter, 2) duration, 3) enforcement mechanisms (but not their effectiveness), 4) decreased risk of loss of protection (through the absence of rules like compulsory licensing), and 5) membership in international treaties. Like the RR Index, it only accounts for “on the book” laws, and not levels of counterfeiting or effectiveness of enforcement. Park and Ginarte found that patents have an indirect effect on economic growth, in that they influence the accumulation of factor inputs (such as R&D and physical capital).

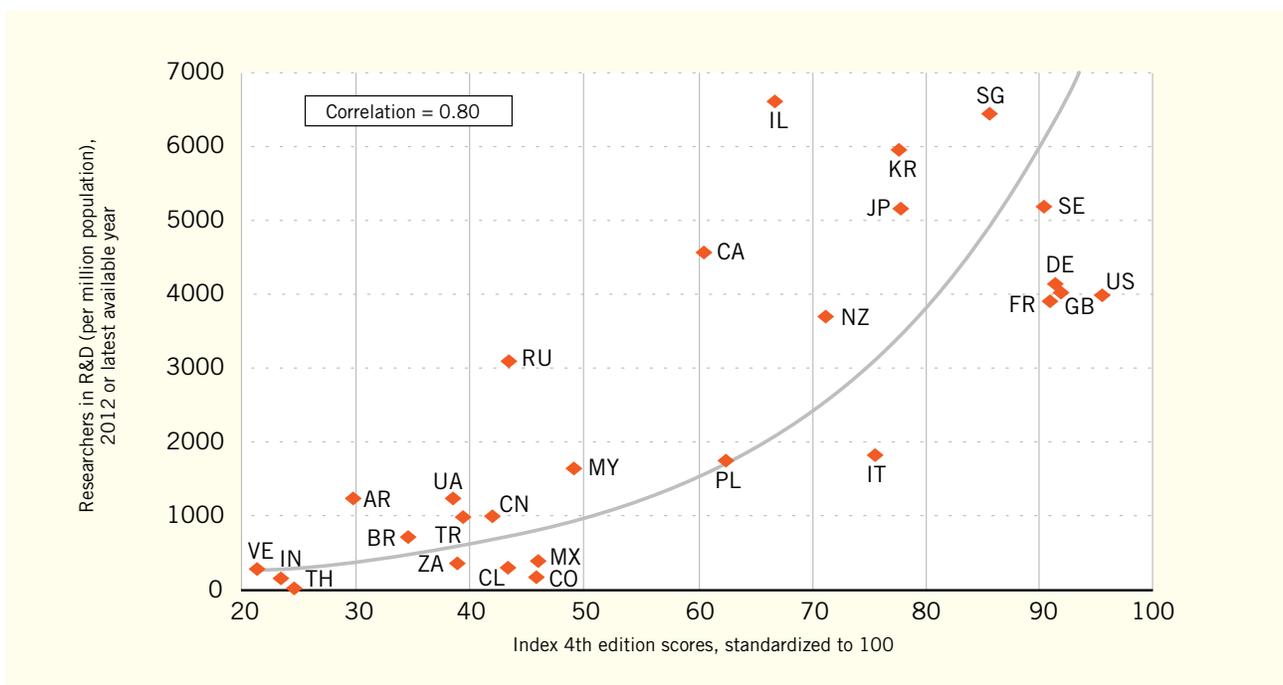
In a recent and compelling study on the effects of stronger patent protection on economic growth, Hu and Png (2013) investigated whether the wave of patent reforms (which have tended to make patent rights stronger) since the 1980s led to an increased level of economic growth in a diverse sample of countries, and whether patent-intensive industries grew faster than non-patent-intensive industries. They found that stronger patent rights were associated with patent-intensive industries growing faster, and this effect was stronger in developed than developing countries. A one standard deviation rise in effective patent rights, for example, was associated with a 1/18 rise in the annual growth of the (non-patent-intensive) leather industry, and a 1/6 increase in the patent-intensive chemicals industry (which includes pharmaceuticals).

Beginning in January 2013, with follow up studies each year since, the Global Intellectual Property Centre (GIPC), a division of the United States Chamber of Commerce (USCC), built on the research of Rapp and Rozek and Park and Ginarte by constructing a more comprehensive index of the strength of a country’s IP protection. The GIPC index is unique in that it not only includes a seven-indicator patent protection strength category (similar to the GP Index but more nuanced), but also separate indicators to measure a country’s trademark, copyright, and trade secret protection, as well as its enforcement mechanisms and treaty adhesion.

In February 2017, GIPC issued *The Roots of Innovation*, the fifth edition of the index (GIPC Index 2017). This followed *Infinite Possibilities*, the fourth edition (GIPC Index 2016) issued in February 2016. Because the GIPC Index 2016 contains more specific innovation-centric analysis than the GIPC Index 2017, both are referred to herein. Canada, in any event, scores similarly in both.

Based on calculations of correlation, the GIPC Index 2016 states that “Nearly triple the workforce is concentrated in knowledge-intensive sectors in economies with favorable IP regimes” (GIPC 2016a) (see chart 3).²⁰

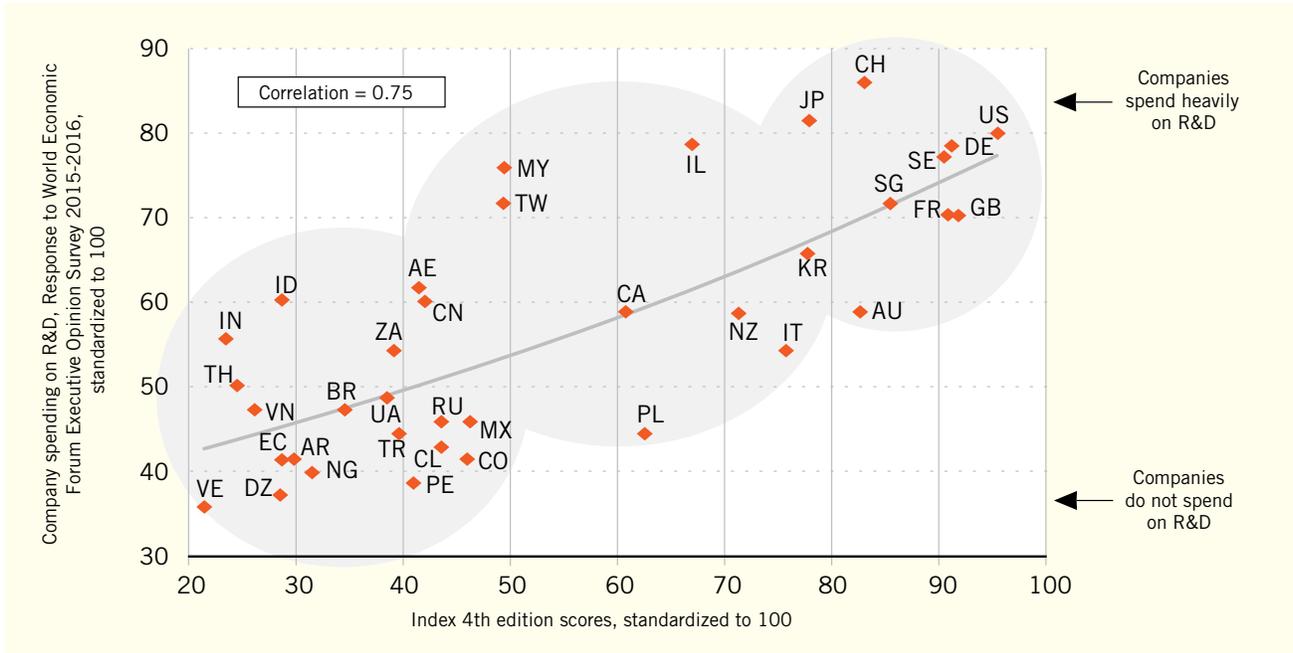
CHART 3 Association between IP protection and number of researchers in R&D



Source: GIPC 2016b, 11.

It also states “Economies with state of the art IP environments produce nearly 70% more innovative output”, and that “Firms in economies with advanced IP rights in place are nearly 50% more likely to invest in R&D activities” (see chart 4).

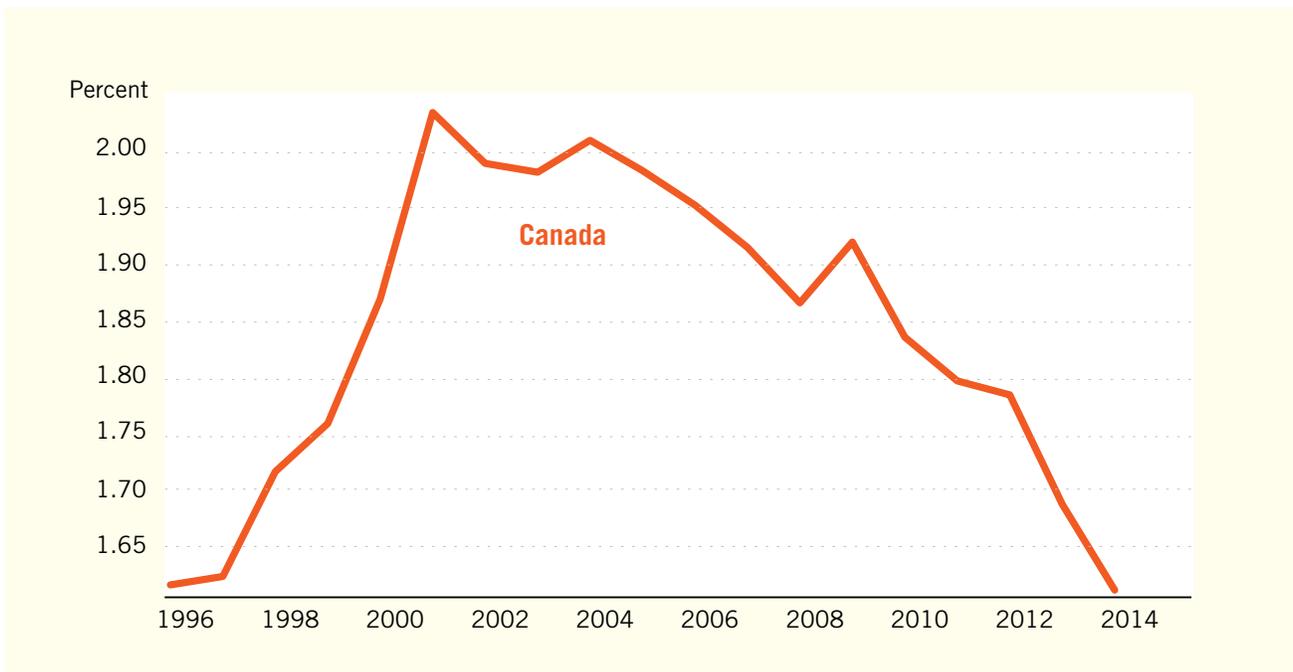
CHART 4 Association between IP protection and company spending on R&D



Source: GIPC 2016b, 15.

While in chart 3 Canada appears to have a comparably high number of R&D researchers, that number has declined in recent years, from a high of 4,786 researchers in R&D per million people in 2011 to 4,519 in 2013, according to the World Bank. This bears watching. More importantly, again according to the World Bank, research and development expenditure as a percentage of GDP has fallen dramatically in Canada (see chart 5) while actually increasing in general across the globe.

CHART 5 Research and development expenditure (% of GDP)



Source: World Bank n.d.-a.

Of course, these are generally examples of correlation,²¹ and from them one cannot with certainty infer causation. That said, these data, and many others set out in the GIPC Index, are powerfully suggestive. They conclusively demonstrate that innovation and strong IPRs are not inconsistent, as some reprobate IP ideologues have alleged.

The GIPC Index 2017, while not graphing correlations for each country like the GIPC Index 2016, does provide a summary list of powerfully robust correlations of IPR strength with positive innovation outcomes.

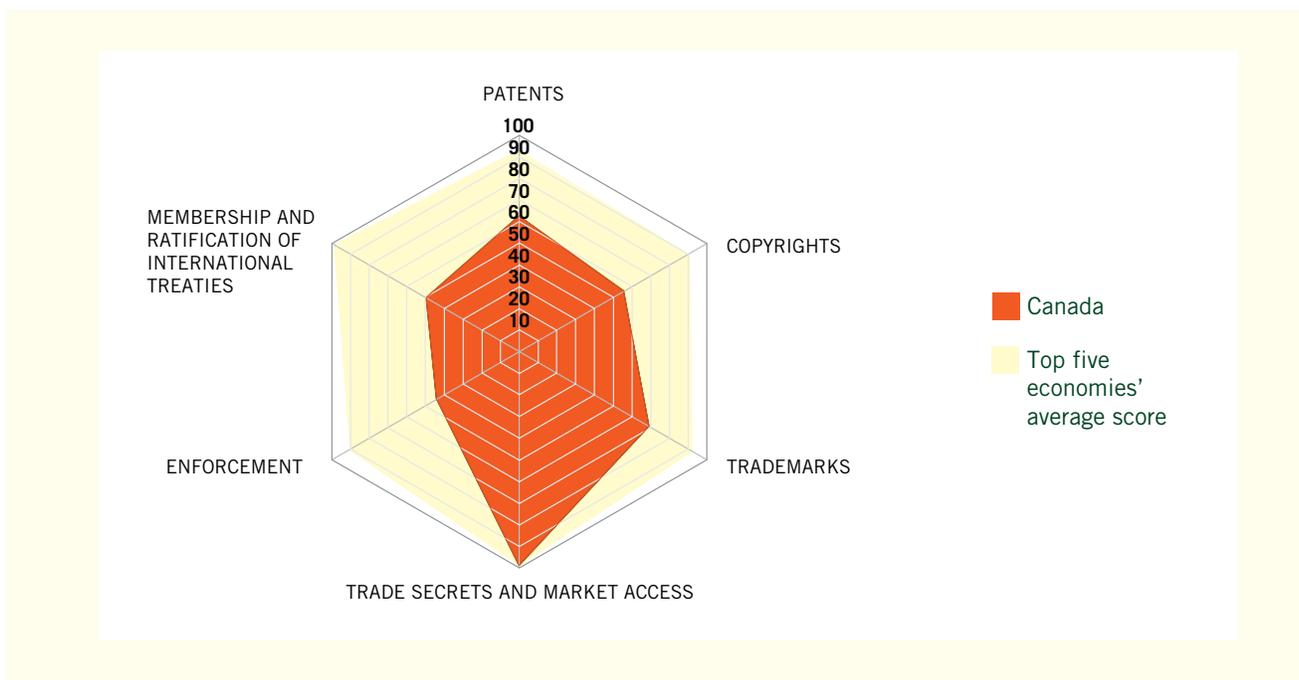
The GIPC Index 2017 ranks 45 national economies as IP-friendly jurisdictions, awarding points based upon consistently applied criteria and resulting in scores ranging from a low of 6.88 for Venezuela to a high of 32.62 (out of a possible 35) for the US. Canada fared rather poorly, with a score of 21.44, at number 17 between Taiwan and Israel.

While Canada's score has increased, the increases were merely nominal. Indeed, the GIPC Index 2016 notes that:

Even Canada – which has improved its overall score in each edition of the Index – remains an outlier among high-income OECD economies. Despite increasing in each edition of the Index, Canada's score is still the lowest of all OECD economies and its national IP environment has consistently remained closer to middle-income economies such as Malaysia and Mexico than to top Index performers such as the United States and the United Kingdom. (23)

Chart 6, a graphic from the GIPC index, sets out Canada's relative performance with respect to GIPC criteria.

CHART 6 Canada's GIPC performance relative to the top 5 economies' average score



Source: GIPC 2017.

With respect to category 1, patents, Canada is singled out in the GIPC Index 2016:

As in past editions of the Index, Canada's score in this category is the lowest of all

developed high-income OECD economies and is closer to that of China, Turkey, the UAE, and Brunei than that of Singapore, the United Kingdom, United States, Japan, and other high performers. (27)

In copyrights and trademarks, Canada also scored poorly. Canada's poor showing continued with its score on enforcement of 3.11 in 2017. And in respect of category 6, membership and ratification of international treaties, Canada scored a rather dismal 2 out of a possible 4; many OECD nations scored perfect 4's.

We do not disagree with these rankings. Indeed, this series of papers is largely based on the premise that Canada needs to improve its IPRs. But we do not wish to be alarmist, either. Canada has an advanced and relatively current set of IP laws and makes inroads into having a robust innovation economy. The situation is not bleak, but it needs substantial improvement. Certain tendencies and influences in the country regarding IPRs are worrisome. If we want, as we must, a more innovative, 21st century economy, the government of Canada must follow through on its commitment to a new IPR strategy, as announced in the recent budget.

Published by the American Property Rights Alliance, the *International Property Rights Index 2016* (IPRI) (Levy-Cariente 2016) measures and compares property rights, including IPRs, for 128 countries. Less well-known than the GIPC Index, it is a source of a range of interesting data and correlations.

“ If we want a more innovative, 21st century economy, the government of Canada must follow through on its commitment to a new IPR strategy.”

It documents strong correlations between strong IPRs and GDP per capita and entrepreneurship, and slightly less strong correlations with capital formation and economic complexity. In the IPRI Canada ranks 10th for property rights overall, ahead, even, of the US (Finland is first). IP measurements include only patents and copyright. The US ranks considerably ahead of Canada on IPRs, however.

How valid are these rankings? Insofar as they rely on objective indicia of the strength of an IP regime – number of treaties signed, length of periods of protection, and so forth – they provide a consistent basis for comparison and understanding

of individual jurisdiction useful to traders and scholars. IP is a world in which it is difficult to derive empirically-based policy insights. To infer a linear relationship between every increase in IP rights and increases and innovative activity is reaching further than the indices allow us to do, but the rankings and correlations with the innovation economy are well-made and helpful.

Canada's IP problems are further reflected in its capture in the *Special 301 Report*, a list of countries deemed by the US Trade Representative (2016) to have deficient IP regimes (301 List). Canada is a long-time resident on the 301 List, but it rejects the process that gives rise to it. Canada is on the “watch list”, the first (lowest) of three categories of concern into which the 301 List is divided. Canada is cited in particular for digital piracy; lack of customs agent authority; rights of appeal for pharma patents; and heightened patent utility requirements. All of these will be elaborated in the next two papers. The 301 List has long been a sore point in Canada. An information note addressed to Heritage Minister Joly from deputy minister Graham Flack (2016) after the release of the 2016 301 List states that: “Canada does not recognize the validity of the process as the findings tend to rely predominantly on allegations from industry stakeholders rather than on objective analysis.”

The GIPC Index is sometimes resented for dwelling on Canada's flaws. However, the insufficiencies described – digital piracy, pharmaceutical patent validity and appeals, authority of customs agents,

patent utility requirements – are indeed demonstrable deficiencies in Canada’s IP regime. Maybe the US and IP-based industries should be less worked up about them, maybe not. But they raise the very simple question – what is the point of getting them worked up at all when it is in every way to Canada’s advantage simply to fill the lacunae?

Empirical economic research

There is a large literature that attempts to demonstrate the economic effects of IPRs. Some of it focusses directly on the link between IPRs and economic growth, and some uses surrogates for overall growth (most commonly rates of patenting or R&D). This literature demonstrates a robust positive relationship between the strength of IPR systems and R&D/GDP ratios and rates of patenting (Var-sakelis; Kanwar and Evenson 2003; Park and Ginarte 1997).

Hall, Jaffe, and Trajtenberg (2004) find that, in the US, a firm’s patent stock (meaning both the quantity of patents held and quality of these patents as measured by number of citations in subsequent patents) contributes meaningfully to its market valuation. Holding all else constant, an increase of one patent per million dollars of R&D spending increases a firm’s market value by 2 percent, and an extra citation per patent increases a firm’s market value by 3 percent.

After an extensive review of empirical literature, Hall and Harhoff (2012) conclude that there is clear evidence that patents at least provide incentives for innovations in biotechnology, pharmaceuticals, and medical instruments. Kanwar and Evenson (2003) find that the ratio of R&D spending to GDP can be explained internationally in part by a country’s level of patent protection, and that a one-unit increase in the GP Index of intellectual property protection is associated with a 66 percent increase in a country’s R&D to GDP ratio.

Qian (2007) finds that, based on a survey of 26 countries that granted patent protection over pharmaceuticals in the period 1978–2002, less-developed countries did not experience a rise in innovation after these changes, but in developed countries with a relatively low degree of patent strength, extending patent protection did indeed increase innovation (as measured by US patent grants to residents of the countries under study, and domestic R&D and pharmaceutical exports).

There is a body of literature that suggests that strong patent laws are more likely to induce innovation in countries with open economies, because in more closed economies the competitive framework is not conducive to innovation regardless of patent laws (Rivera-Batiz and Romer 1990; Gould and Gruben 1996). Research also suggests that the positive effects of strengthening international patent policies (as a result of international treaties) on innovation and growth are much more pronounced in wealthy countries than they are in poorer countries, and middle income countries (Flavey, Foster, and Greenway 2006).

“ By strengthening IPR laws, countries can attract technology from international firms, diffuse it throughout the domestic economy, and develop indigenous innovative industries.”

The mechanism by which innovation is said to stimulate economic growth is technology diffusion. GDP growth is a function of, among other things, total factor productivity, a component of which is the rate at which new technologies are adopted and diffused (Greenhalgh and Rogers 2010; Putnam 2006). Innovation introduces new goods and services to the market, and improves the method of production of current goods as well. By strengthening IPR laws, countries can attract

technology from international firms, diffuse it throughout the domestic economy, and develop indigenous innovative industries.

This is confirmed in a study by Nunnenkamp and Spatz (2003), which reviewed data from 166 countries, finding that strengthening IP laws was associated with increased investment by US firms, and that in countries with the capacity to imitate US technology (measured by average years of schooling), that foreign direct investment (FDI) was more likely to be replaced by licensing, as local firms adopted and adapted foreign innovations. Smith (2001) reaches similar conclusions: a one-unit increase in the RR Index was associated with 0.6 percent increase of affiliate sales and licensing (as compared to the direct importation of foreign technology) in countries with high imitative capacities.

IPRs influence firms in important ways. US survey research suggests both that stronger patent protection encourages firms to innovate, and that US-based multi-national corporations (MNCs) are more amenable to the idea of FDI if the target country has strong IP laws (Lee and Mansfield 1996). Experience as a legal practitioner strongly supports the insight that technology-possessing firms are diligent and highly cautious in their inquiries about IPRs in countries in which they will invest, or even licence to consumers, their technologies.²² Particular care has been taken with government infrastructure projects and public private partnerships. The nationalization of Pearson Airport, for instance, was a shock even to US licensors of IP in Canada. Canada competes with other nations in respect of our IPR levels and needs to behave.

Newer models of economic growth account for technological innovation as the result of profit-maximizing choices by firms (the choice to invest in R&D activities, for instance) and the driver of economic growth (Romer 1990; Aghion and Howitt 1992). Economists believe that the rate of growth of an economy is directly related to the introduction of new products, each one adding to the existing stock of human knowledge. Strong IPRs create an environment that is conducive to the accumulation of human knowledge.

“ Strong IPRs create an environment that is conducive to the accumulation of human knowledge.”

However, empirically, it is challenging to demonstrate the effect of any single factor like IP laws in a complex modern economy (Grossman and Helpman 1990; Flavey, Foster, and Greenway 2006; Gould and Gruben 1996; Park and Ginarte 1997). One of the problems is that economists are not fully confident in understanding the full range of determinants to economic growth, and so use an array of variables to model it (Rogers 2003). Hence the problem is less one of favourable data than of microeconomic understanding. This raises the obvious question of just how obsessive one needs to be about the precise mechanisms

by which patents work in the innumerable cases in which they do. The answer (discussed further below) is, not much.

Greenhalgh and Rogers (2010) argue that the main problem with demonstrating the effects of IPRs on aggregate growth is the fact that, while there is an established link between IPRs and a range of “proximate factors” (such as investment, trade, FDI, and R&D), there can be significant feedback between these factors (increasing FDI can spur strengthening of IPR laws and vice versa). Although the proximate factors can affect growth, the magnitude and time lags involved can make the effects difficult to measure. Complicating things further, there are so many other things affecting economic development simultaneously (such as a country’s education system and public health), and IPR laws can have an indirect impact on these (for instance, strong IPRs make pharmaceuticals costly to access; weak IPRs weaken education). While more advanced capitalist economies tend to adopt more

stringent IPR laws, some argue it is not always clear whether these laws are a cause or an effect of an economy becoming more complex and robust.

As Putnam and Tepperman (2011) point out, IPRs can facilitate the commercialization of innovative output by allowing smaller innovative firms (such as domestic biotechnology and tech start-ups) to enter the “market for ideas” by licensing technology to larger firms with commercialization capacity. This is referred to in the literature as a “cooperative commercialization” strategy. An empirical study that demonstrates this was conducted by Gans, Hsu, and Stern (2001). Based on a sample of 118 start-up projects, it was shown that strong IPR protection is more likely to encourage these cooperative arrangements – between small, specialized firms and larger ones with commercialization capacity – because the threat that the larger firm would outmanoeuvre and steal the smaller firm’s technology was lessened.

As Burk (2012) argues, patents can protect smaller firms from strategic behavior by larger ones. Thus, a robust patent environment fosters vertical de-integration and small firm specialization. Barnett (2011a) argues that this promotes efficiency, as R&D and innovative activity are better separated from downstream manufacturing processes, and each stage in the production process is better executed by specialized firms. These findings were supported by research by Hall and Ziedonis (2001) in the semiconductor industry. Hall and Ziedonis find that a group of smaller “design” firms without manufacturing capacity were able to patent intensively to protect their competitive advantage. These firms then designed and licensed semiconductor products to larger companies, who manufactured and commercialized them. In the absence of robust patents, these smaller design firms would have had to make an enormous investment in manufacturing capacity in order to bring their inventions to market (Putnam and Tepperman 2011). Therefore, patents significantly reduced barriers to entry for these firms. In a start-up economy like Canada’s, these effects are of paramount importance.

Strong patent protection can be essential for start-ups to enter the market on a level playing field with larger firms. Barnett has noted that large, established firms often make use of what he terms a *second-mover advantage*, whereby R&D costs are circumvented when large firms make use of “extra-legal” patent substitutes (economies of scale/scope and trade secrecy for instance) to imitate and market innovations made by start-ups and smaller entrants, who are then bullied out of the market or bought out by the larger firm at a discounted price. These tactics, Barnett (2011b) points out, are commonly associated with firms like IBM and Microsoft in the business press.²³ Schnaars (1994) records a number of instances where valuable inventions that were pioneered by small, first-mover firms were subsequently copied and marketed by larger firms. The author’s own experience with i4i in its dealings and subsequent legal battle with Microsoft very much bears this out.

““ Strong patent protection can be essential for start-ups to enter the market on a level playing field with larger firms.”

A brief look at US economic history demonstrates how this can work. Barnett outlines a body of work by economic historians who argue that in the second half of the 19th century, stronger patent protection (in the form of lower patent fees and relaxed standards of examination) induced R&D, especially by individual inventors, and created a secondary market in patent sales, assignments, and licences. Barnett (2011b) argues that recent developments in the semiconductor, biotechnology, and petrochemicals industries exhibit a remarkably similar pattern (only now it is start-ups, more than individual inventors, responsible for the R&D):

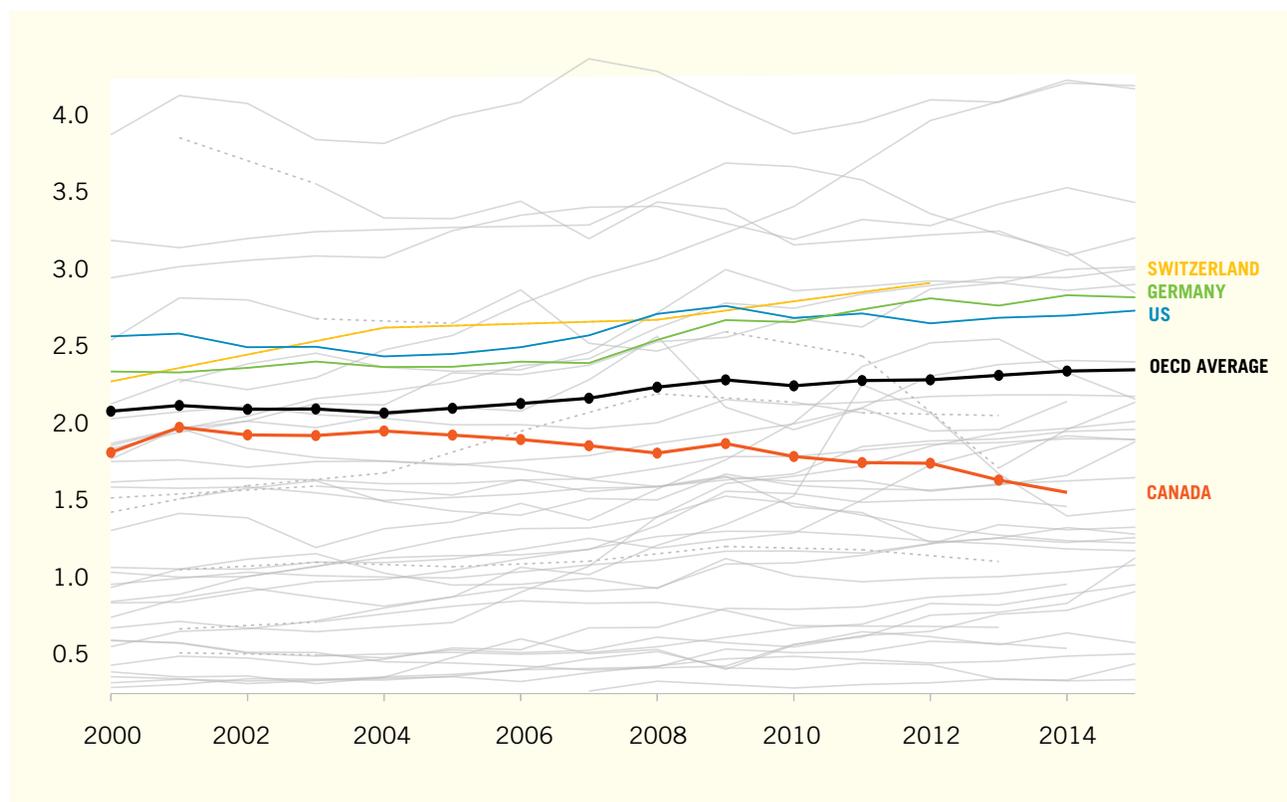
Strong patent protection (combined with favorable technological developments) appears to have facilitated upstream entry by small research intensive firms into concentrated markets that were formerly protected by high capital intensity requirements,

resulting in a bifurcated industry structure where much of the industry’s R&D functions are allocated to hundreds or even thousands of upstream suppliers . . . whereas patents may not be required to enable large integrated firms to accrue returns on innovation investment (as the first mover advantage suggests) they may be critical for supporting entry by small (or more generally, weakly integrated) firms who have a rich stock of technological expertise but lack a portfolio of complementary assets by which to secure innovation returns against imitation. (201)

Technology transfer is a two-way street – the presence of large, IP holding firms in a low IPR country can facilitate the “downstream” transfer of physical technology and know-how, and productivity spillovers to the receiving country in the short term, and in the long term, can promote “up-stream” transfer, as specialized domestic firms improve on and adapt this technology, then enter into agreements to market their innovations internationally. Similarly, to allow wealth-generating MNCs to do business in Canada can not only serve to disseminate valuable technology and best practices to our domestic economy, but can also provide channels through which smaller domestic firms without commercialization capacity can bring their ideas to market.

Looking at the emerging structure of Canada’s information and communication technology and bio-tech/life sciences industries, it is clear that the only direction to go is towards stronger patent protection. Just as with the historical example of the US, small research intensive firms have proliferated in Canada as patent strength has increased. To be sure, Canada still has a long way to go before it is on par with R&D powerhouses like the US, Switzerland, or Germany. Chart 7, an infographic from the OECD, indicates how Canada ranks relative to other OECD countries for research and development expenditures as a percentage of GDP.

CHART 7 Canada relative to OECD countries for R&D expenditures as a percentage of GDP, 2000–2015



Source: OECD 2017a.

Strengthening patent protection will not bring us there on its own, but it is a key piece of the innovation policy edifice. Specifically for the Canadian innovation ecosphere, strong IPRs are critical to allow small and medium sized enterprises (SMEs) to deal effectively with market opportunities, including financings and acquisitions.

In this paper, we have endeavoured to provide the most up to date studies and data available. But the world is changing so quickly. Remember charts 1 and 2 above? Those incredible increases in IP and related commerce occurred during and after the research cited in this paper. When that research is updated, conclusions about the importance of IPRs can only become sounder.

Available research, however, is strongly supportive of strong IPRs. From the foregoing, brief review of certain empirical research in the field, some of the points we can take away include:

- Relative to other OECD countries, Canada rates poorly in comparative indices of the strength of IPRs. There is considerable room for improvement.
- Numerous studies prove stronger patent protection correlates highly with economic growth, with research and development spending, and availability of start-up financing.
- Strong IP laws encourage technology transfer and foreign direct investment and with these come improved national diffusion of new technologies.
- Strong IP laws encourage the growth of smaller firms and protect them from larger firm strategic behaviour. They also encourage firm specialization and productive dealing between firms.

Causation and correlation

Much is often made of the fact that evidence of the efficacy of the IP regime is more about correlation than causation,²⁴ and that IPRs are little understood on a microeconomic level. The cast of such observation is often to try to further bring into question the very efficacy of IPRs, as though to say, we do not know precisely how they work, so maybe they do not work at all.

But how could we possibly hope to grasp the millions and millions of nuanced decisions made in the market for IP, even on some general basis? Any more than we do for other kinds of property rights? Better not to try. Complexity plays a role in making evident that fine-tuning IPRs is a pointless task (Fisher). For how many areas of public policy have we clearer evidence of causation than for IP? Policy-makers generally proceed on the basis of economic theory and empirical evidence gained along the way. How is IP any different? We can proceed quite comfortably on the mass of economic data and theory available, including those presented in this paper. To complain about the uncertainty of causative links is merely to nitpick; our body of knowledge is so great that the scope of our ignorance is relatively inconsequential.

Moreover, if we understood causation better, central planning types would just build more arguments to interfere more intimately with a perfectly good set of property rights, such as Profes-

sor Terry Fisher does with his Social Planning Theory of IP,²⁵ or, similarly, with the suggestion, actually made, that a government agency estimate the social value of innovations and pay the inventors out of tax revenues (Shavelle and van Ypersele 1999, cited in Fisher). We do not raise these spectres of social engineering merely to ridicule them. Such ideas have proven dangerous before. But these ideas are entirely unnecessary. Property rights, intellectual property rights, work, and the markets for them do

“ Predictable and stable property rights may be old school, and necessarily invoke trust in the invisible hand of the market, but they work.”

an excellent job attributing value. A great deal can be said for setting rules, then leaving well enough alone. Look, for instance, at the terrible losses of value created by the Supreme Court of Canada's mucking about with long settled rules of fair dealing.²⁶

Predictable and stable property rights may be old school, and necessarily invoke trust in the invisible hand of the market, but they work. They are the only system that does, or can.

Conclusions

The Government of Canada promises a renewed IPR strategy. IPRs are a critical, non-fiscal innovation lever and Canada's policy should be to make its IPR regime stronger. Evidence, indeed dispositive evidence, demonstrates the importance of IPRs to modern economies. Strong IPRs correlate highly with favourable national innovation outcomes. This seems to be true at any stage of economic development, but, as studies show, it is particularly so for an advanced and open economy like Canada's. It is also particularly true for an economy so populated by SMEs as is Canada's. IP is critical for innovative SMEs to have a fighting chance in an ICT environment characterized by the presence of many large firms, as well as to increase their access to capital.

IPRs have been refined over many, many years and have reached a state of high conformity to the needs of the market and the dictates of philosophical theory. Their elegance should be better appreciated than it is, and caution should be the earmark of proposals to change them. A conservative approach is best.

“IPRs are a critical, non-fiscal innovation lever and Canada's policy should be to make its IPR regime stronger.”

IPRs are also strongly justified philosophically and morally, under theories of Lockean entitlement to products of labour, and Hegelian and Kantian theories of personality. We identify creative work with its creator and our respect for her efforts extends to granting control over its publication and use, and appropriation of its value in the market. IPRs are also essential for utilitarian reasons. They are incentives to the creation, disclosure, and distribution of IP. They are important signals, reducing cost of capital to SMEs.

They allow more efficient arms' length transactions and facilitate firm formation and collaboration among firms.

While patents are the typical measure of innovation, copyright has become more important than it used to be, both for its protection of technological goods (electronic games, software) as well as of cultural content (film, books, sound recordings). We noted the absence of impact of copyright on freedom of expression because of its narrow, "thin" nature, and the lack of clear connection between expiry of copyright and decrease in price of goods, and the fact it takes nothing from the commons. The so-called copyright "balance" was shown to be unsound conceptually and economically. Governments have tended to extend copyright terms from time to time in no small part because of an absence of good reasons not to. We advocate an end to copyright term limits.

Various critiques of IPRs were discussed. Certain critics argue against international IP norms, in favour of a "made in Canada" approach. However, this "made in Canada" approach is poorly defined, and no coherent explanation is offered of how Canada is so different as to demand a radically changed IPR regime. IP, because of its heavy impacts on trade and because its rules derive from in-

ternational treaties to such a very great extent, is about international standards and developments, not sheltered parochialism.

The so-called anti-commons effect is alleged to hinder innovation through the issuance of too many patents in a field of invention, principally biotechnology. We demonstrated it to be unsound theoretically and empirically, and to have failed to demonstrate any critical threshold beyond which the effects of an increasing number of patents became innovation-discouraging, as alleged.

The deadweight loss argument is to the effect that the monopoly effects of IPRs create socially sub-optimal allocations of the benefits of IPR-protected goods, because of the ability to charge a price not all may be able to afford. Of course, the fact that things cost money is no deep policy insight. Price is an important allocative factor in a market. This deadweight loss theory, moreover, was seen to account inadequately for the creation and existence of IP in the first place, and the high value that ought to be accorded to commercialization activity and infrastructure. It also neglects the mitigating effects of discriminatory pricing.

The right and the left each has a stock critique of IPRs. The right principally objects to coercive laws that effect objectionable monopolies, and which allegedly interfere with freedom of speech and of the press. But the nature of IPRs, and particularly copyright, in no way limits the flow of information or indeed original self-expression. Also, it fails to account for the usefulness of patents in preventing information from being kept secret. The argument from the left is not so different. It takes up the user's perspective and derides property barriers that inflict potentially high costs and limits the ability to copy for purposes of self-expression (assuming that it is in fact at all possible to self-express through copying, which we very much doubt). But its arguments ignore the critical incentive effects of IPRs, and the role of markets in ensuring the availability of IP-protected goods to consumers.

We also demonstrated that the Canadian government has been tacking in the wrong direction on IP, away from traditional protections.

The *Copyright Modernization Act* in particular showed a worrisome tendency to limit copyright, not to sustain its critical protections. The judicial branch, in the form of the SCC, similarly has reawakened from its long slumber on IP issues to come up with a series of doctrinally wrong and unfortunately IP-unfriendly judgments. The court needs better information and the support of a better IP academy. It also needs, as a subsequent paper will argue, more native IP expertise.

The international politics of IP strongly mitigate in favour of stronger IPRs in Canada. These politics are informed in part by multi-national comparative indices, such as the GIPC, IPRI, and GII. All of these show significant deficiencies in Canada's protection of IP, with which we agree and which we anticipate that the forthcoming MLI IP Index will further substantiate. Also there is the 301 List issued by the US Trade Representative's office, on which Canada has long resided as an IP delinquent. There is also IP's impact on trade relations, as seen in the content of CETA and the TPP, which demonstrates the need for adjustment to Canada's IP regime in particular to better accommodate pharmaceuticals and better protect copyright.

Data from the World Bank, GIPC, and OECD demonstrate Canada's continual poor showing in terms of innovation and IP.

Lastly, we have contextualized the frequently stated concern for a lack of understanding of the micro-economics of IPRs. It was demonstrated not to be a real hindrance to IP policy formulation. We have strong economic and theoretical evidence for the incentive effects of IP, next to which the scope of our supposed ignorance of microeconomic mechanisms is inconsequential.

“ The international politics of IP strongly mitigate in favour of stronger IPRs in Canada.”

Recommendations

We support strong IPRs and free trade, and believe strongly that robust IPRs benefit Canada's innovation economy. Our recommendations generally are addressed to fixing deficiencies in its IP regime relative to the achievements of other jurisdictions. Based on our research, Canada should certainly maintain a policy generally of setting, or at least keeping to, an internationally high standard for IP protection. These recommendations are drawn from the preceding text and/or will be elaborated in parts 2 and 3 of this series.

RECOMMENDATION 1: End term limits for copyright

As discussed at some length, the nature of copyright protection is such that there is no justification to limit the term of protection. Copyright protection does nothing to reduce the store of common property. Copyright does not even create a monopoly, and there is no reason it should be singled out from other types of property for expiry. Therefore, our recommendation is to **end term limits for copyright**. Using the rule of reciprocal treatment under Berne, let other citizens of other signatory nations enjoy copyright for the length of the terms, if any, of their own nation. This would be a bold move, consistent with Canada's treaty obligations and showing leadership in IP. In the more conservative but less desirable alternative, adopt the already widely-used term of 70 years plus the life of the author, gaining Canadian creators the like benefit in European markets.²⁷

RECOMMENDATION 2: Protect wide patent subject matter

Out of step with all OECD countries and with the plain wording of Canada's *Patent Act*, the SCC ruled that "higher life forms" could not be patented. The life form in question was the oncomouse, a mouse whose DNA had been edited by Harvard College researchers to make the mouse especially oncogenic. Such inventions are entirely worthy of protection. The decision was a blow to Canada's life sciences industry. Moreover, the reasoning of the decision – that patents over higher life forms were not contemplated by the 19th century legislature that adopted the *Patent Act* – brings into doubt all future, unknown classes of patent. Accordingly, it is our recommendation to **legislate patent protection for higher life forms**, reversing the Harvard College decision of the SCC and bringing life sciences patenting in line with the rest of the OECD. In reversing the damage done by the Harvard College decision, there should also be a legislative adoption of interpretative principles for the *Patent Act* that make it clear that anything under the sun²⁸ (or indeed, elsewhere in the universe) made by man and that meets the standards of the *Patent Act* is patentable, subject only to express, legislated exceptions.

RECOMMENDATION 3: Facilitate patenting by SMEs

Small and medium size businesses drive much of Canada's innovation economy. They tend to be insufficiently grounded in the possibilities of IP to help to grow their businesses. Accordingly, we recommend to **facilitate patenting by SMEs**, perhaps by reducing or waiving fees for first patents, and further publicizing the value of IP protection.

RECOMMENDATION 4: Implement trade agreements and their IP provisions

Canada is lucky to have rigorously negotiated, sound agreements to open trade in the Pacific Rim and Europe, through the TPP and CETA respectively. The former, admittedly, is in considerable doubt at the moment. Still, the IP requirements of these agreements will benefit Canada. Accordingly, it is our recommendation to **implement the TPP and CETA**, subject to other signatory nations doing so, and continue to further support freer trade in IPR-protected goods.

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Endnotes

- 1 For an example of Professor Geist's view of "made in Canada" IPRs and his blunt, misconceived assertion that stronger rights are not in the public interest, see his 25 January 2017 blog post, "The Trouble for Canadian Digital Policy in an 'America First' World."
- 2 Foreign filer data are very similar; see World Bank, "Science and Technology: Patent applications, nonresidents," <http://data.worldbank.org/topic/science-and-technology>.
- 3 See the section on the GIPC Index, beginning on P. 23.
- 4 For analysis of the IP provisions of CETA and the TPP, see Richard Owens, 2015, "Debunking Alarmism Over the TPP and IP"
- 5 For analysis of the IP provisions of CETA and the TPP, see Richard Owens, 2015, "Debunking Alarmism Over the TPP and IP"
- 6 "Higher" life forms were excluded from patentability in the Harvard Mouse Case, *Harvard College v. Canada (Commissioner of Patents)*. In this case the court also made the very awkward finding that the *Patent Act* only allowed for inventions contemplated by the 19th c. legislature that enacted it. It is difficult indeed to see how this rule can be usefully applied.
- 7 CETA requires this to change.
- 8 "A certificate of registration of copyright is evidence that the copyright subsists and that the person registered is the owner of the copyright" (*Copyright Act* s. 53(2)).
- 9 For instance, the SCC has ruled that downloading a work is not a "telecommunication", but streaming it is (*ESA v. SOCAN*, 2012 SCC 34).
- 10 See, e.g., *Copyright Act*, s.2.
- 11 Professor Terry Fisher, while finding Lockean theory useful in analysing IP, breaks it down to demonstrate why its fit is imperfect in his undated "Theories of Intellectual Property". Professor Fisher also enlarges on the idea that Lockean theory applies to labour applied to something taken from the commons, converting the common property thereby to personal ownership. Fisher suggests that ideas used, for instance, in authorship are analogous to common property, but that seems far-fetched.
- 12 Contrast with those who theorized that once separate from the author, work took on an individual and separate existence, like Hegel (Fisher).
- 13 That of the authors included, although between us we indulge in habits of photography, poetry, and fiction, so (hopefully) have some little glimpse of creative spirit.
- 14 A timely re-statement of the argument from the right appeared in the *National Post* of all places on March 29, 2017 in Bruce Parry's article "It's Not the Robots, It's the Patents," p.FP9. See also: Kevin A. Carson, 2009, "'Intellectual Property': A libertarian critique."
- 15 See for example James Boyle, 2003, "The Second Enclosure Movement and the Construction of the Public Domain."
- 16 The next paper will demonstrate that there is no deficit in copyright goods and services, and a modest one only in patent industries.

- 17 See the next paper in this sequence for a detailed discussion of pharmaceuticals and the impacts of the utility requirements set by the SCC.
- 18 *Moral rights* are rights granted by the *Copyright Act* that give an author, irrespective of any economic dealings with her work, the right to the integrity of the work and to have her name associated with it.
- 19 For a view on the importance of the concept of “speech” to copyright, see Abraham Drassinower, 2015, *What’s Wrong with Copying?*; also Riccardo Pozzo, 2006, “Immanuel Kant on Intellectual Property.”
- 20 From the GIPC Index. Used with the consent of the GIPC.
- 21 The GIPC Index 2017 does not contain the same useful graphs as the GIPC Index 2016, but it does contain a useful list of the high correlations of a strong IP regime with innovative activity.
- 22 Confidentiality obligations limit our ability to give examples.
- 23 See also *Microsoft Corp. v. i4i Ltd. Partnership*.
- 24 See, for instance, de Beer 2016 and Fisher.
- 25 Check out the ominous “Social Planning Theory” of IP propounded by Terry Fisher: <http://www.law.harvard.edu/faculty/tfisher/iptheory.html>. It is as bad as it sounds.
- 26 See the next paper for an extensive discussion of fair dealing.
- 27 The rule of reciprocal treatment and its application to Europe and other jurisdictions will be discussed in the next paper of this series.
- 28 This would be consistent with the US approach in which “anything under the sun made by man” is, subject to legislated exceptions, patentable: *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).



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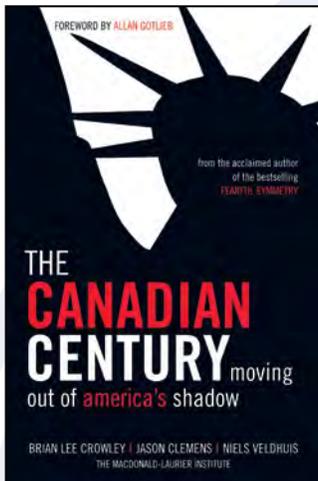
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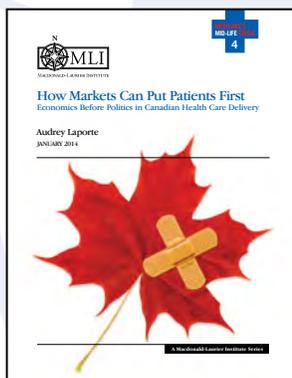


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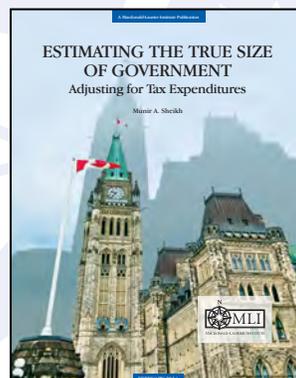
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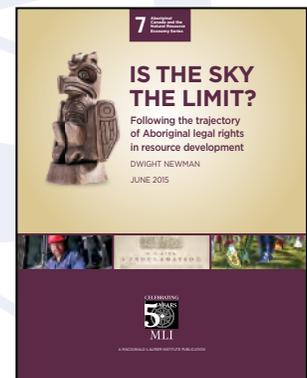
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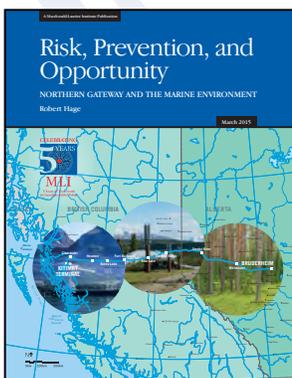
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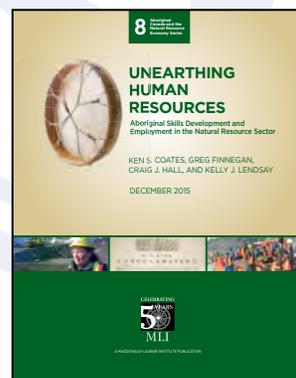
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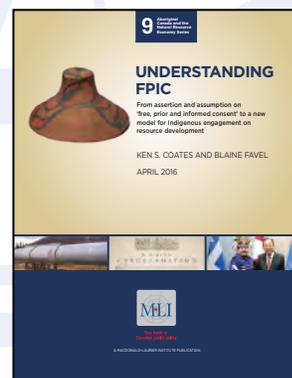
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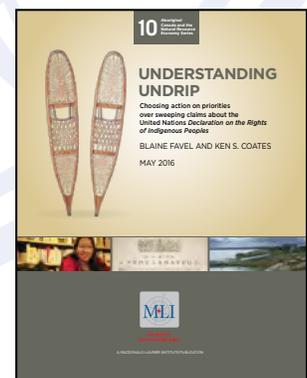
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