INTELLECTUAL PROPERTY AND ITS ALTERNATIVES: INCENTIVES, INNOVATION AND IDEOLOGY

(Spine title: Intellectual Property and Its Alternatives)

(Thesis format: Monograph)

by

Michael B. McNally

Graduate Program in Library and Information Science

A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

The School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

© Michael B. McNally 2012

THE UNIVERSITY OF WESTERN ONTARIO

SCHOOL OF GRADUATE AND POSTDOCTORAL STUDIES

CERTIFICATE OF EXAMINATION

Co-Supervisor

Dr. Ajit Pyati

Co-Supervisor

Dr. Samuel E. Trosow

Supervisory Committee

Dr. Sandra Smeltzer

Examiners

Dr. Grant Campbell

Dr. Heather Hill

Dr. Scott Schaffer

Professor Myra Tawfik

The thesis by

Michael Blaine McNally

entitled:

Intellectual Property and Its Alternatives: Incentives, Innovation and Ideology

is accepted in partial fulfilment of the
requirements for the degree of
Doctor of Philosophy

Date_____

Chair of the Thesis Examination Board

Abstract and Keywords

This dissertation examines the ability of intellectual property and its alternatives to both facilitate and impede innovation. The thesis begins by positing that a more detailed and nuanced understanding of alternatives to intellectual property is required so that such alternatives can be effectively used to mitigate the problems of the expansionary intellectual property regime. The thesis is that substantive alternatives to intellectual property utilize a broader range of incentive structures to encourage the production and distribution of intellectual goods, facilitate greater access to such goods and their informational content and engender innovative outcomes that go beyond the narrow, instrumentalist goals of wealth creation and productivity growth. Using critical theory as a methodology the dissertation examines both the macro-level intellectual property regime as a whole and uses specific empirical case studies (the Songwriters Association of Canada's proposal for a monthly fee on internet service providers and defensive publication). The analytical body of the dissertation begins with a critical examination of the expansionary intellectual property regime. It provides a framework for analyzing the case studies beginning with an examination of the incentives for the production and distribution of intellectual works, then scrutinizes the ability of intellectual property and its alternatives to incent innovative activity, and interrogates the ideological aspects of innovation including its use in theories of the information society. The two case studies are then analyzed focusing on the incentive structures used, their ability to generate innovative outcomes and the ideological assumptions of each case. The analysis of the case studies reveals that in its current form the Songwriters Association of Canada's proposal is not a substantive alternative to intellectual property,

but defensive publication is. The thesis concludes with a holistic analysis of intellectual property and its alternatives and provides specific recommendations. The thesis concludes that policymakers must provide greater support for substantive alternatives to intellectual property to increase innovative activity and address major political, social and economic problems. This dissertation makes a significant contribution to the understanding of alternatives to intellectual property and the nature of innovation.

Keywords

Intellectual Property, Alternatives to Intellectual Property, Incentives, Innovation, Theories of the Information Society, Defensive Publishing, Songwriters Association of Canada

Acknowledgements

I would like to thank my supervisory committee for their dedication and support throughout the entire proposal and dissertation process. Dr. Ajit Pyati has provided excellent supervision as well as constructive and insightful feedback throughout the entirety of the process. Dr. Samuel Trosow has been a superb mentor and been influential in my entire studies of library and information science from my first class in my Masters of Library and Information Science degree through to the completion of my dissertation. Dr. Sandra Smeltzer has served as an invaluable committee member providing a crucial and critical perspective on my dissertation and my work is all the better because of her. I would also like to express my thanks and appreciation to the rest of the FIMS community – faculty, staff and students – who have made the past several years both intellectually stimulating and enjoyable.

I also want to express my thanks to my parents, Margaret and Patrick, who have supported me throughout my academic endeavours. Most importantly I want to express my deepest appreciation to my wife Shahna and son Leland without whom this would have been neither possible nor worthwhile.

Table of Contents

CERTIFICATE OF EXAMINATION ii

Abstract and Keywords iii

Acknowledgements v

Table of Contents vi

List of Tables xiii

List of Abbreviations xiv

Chapter One - Introduction 1

I. Introduction 1

II. Problem Statement 3

III. Justification 6

IV. Thesis 8

V. Theoretical Framework 10

A. Critical Theory and Overcoming Disciplinary Boundaries 10

B. Normative Framework 14

C. Incentives for Producing and Distributing Intellectual Goods 15

D. Outcomes – Access or the Right to Exclude 17

E. Outcomes - The Nature of Innovation 20

F. Towards a Conceptual Mapping of Intellectual Goods 20

G. Innovation and Theories of the Information Society – Castells and Harvey 22

VI. Objectives and Research Questions 29

VII. Methodology 29

A. Structure of the Analysis – An Intensive Research Design 29

B. The Case Study Method 30
C. The Cases 31
D. Selection of the Cases 32
E. Source of Data 34
F. Micro-Level Analysis and Macro-Level Theorization 35
VIII. Limitations 35
IX. Organizational Plan 37
X. Conclusion 39
Notes to Chapter One: 39
Chapter Two – Review of Relevant Literature 48
I. Defensive Publishing 48
II. The Songwriters Association of Canada's Internet Service Provider (ISP) Monthly Fee Proposal 51
Notes to Chapter Two: 55
Chapter Three – The Expansionary Intellectual Property Regime 59
I. Expanse of Traditional IP Mechanisms (Copyright and Patent) 59
A. Copyright Expansion – Term, Scope and Enforcement 59
B. Patent Expansion – Term, Scope, and Pro-Patent Institutions 63
II. Rise of *Sui Generis* Mechanisms for IP Protection 68
III. Incorporation of the IP System to the Global Trade System and Rise of Economic Importance of IP 70
A. IP and Trade 71
B. Economic Ascendency of IP 75

IV. Countervailing Trends 76

V. Incentives and the Expansionary IP Regime 79

Notes to Chapter Three: 79

Chapter Four - Incentives 87

I. Incentives for Intellectual Property 88

A. Justificatory Theories of Intellectual Property and Incentives 88

B. The Incentive-Access Paradigm 94

C. Incentives for Various Types of Actors Involved in the Production and Distribution of Intellectual Goods 97

II. Economics and the Pecuniary Incentive 107

A. *Homo Economicus* and the Underpinning of Pecuniary Incentives 107

B. The Shift in Economic Literature and Legal Thought to an Increasingly Exclusive Focus on Pecuniary Incentives 110

C. The Danger of an Exclusive Focus on Pecuniary Incentives 112

III. Intellectual Activity and Homo Sapiens 115

A. Humans as Naturally Inventive and Creative 115

B. Incentives to Create versus Incentives to Share 118

Notes to Chapter Four: 120

Chapter Five – Innovation 129

I. Theoretical Approaches to Innovation 131

A. Schumpeter and Creative Destruction 131

B. Arrow and the Rate and Direction of Inventive Activity 134

C. Schumpeter, Arrow and the Empirical Literature on Innovation 136

II. The Economics of Innovation 137
A. The Economic Importance of Innovation 138
B. Difficulties in the Economic Analysis of Innovation 139
C. The Rate and Direction of Innovation 141
III. Intellectual Goods and Innovation 143
A. Empirical Evidence on Intellectual Property and Innovation 144
B. Artistic and Creative Work and Innovation 153
C. Anticommons and Patent Thickets 155
D. Openness, Access, the Commons and Innovation 161
IV. Innovation and Ideology 169
Notes to Chapter Five: 170
Chapter Six – Ideology 183
I. Innovation and Ideology 184
A. National Policies on Innovation 185
B. The Danger of Empty Rhetoric on Innovation 192
C. Progress, Innovation and IP 195
II. Innovation and the Information Society 203
A. Bell's Post-Industrial Society, IP and Innovation 204
B. Innovation and IP in Castells' Network Society 207
C. Innovation and IP in Harvey's Critique of Capitalism 211
D. Innovation, IP, and Neoliberalism 214
Notes to Chapter Six: 218

Chapter Seven – Case Studies: The Songwriters Association of Canada ISP Proposal and Defensive Publishing as Alternatives to Intellectual Property 227
I. The Songwriters Association of Canada ISP Levy Proposal 227
A. Overview 228
B. Incentives 234
C. Innovation 236
D. Ideological Elements 238
E. Conclusion 240
II. Defensive Publishing 242
A. Overview 242
B. Incentives 247
C. Innovation 249
D. Ideological Elements 252
E. Conclusion 253
III. The Effectiveness of Alternatives to IP 254
Notes to Chapter Seven: 255
Chapter Eight – Analysis, Discussion, Recommendations and Conclusion 261
I. Analysis of the Case Studies 261
A. Incentives and Self-Interest 261
B. Access, Exclusion and Commodification 263
C. Innovation and Progress 264
D. The Centrality of IP 266
II. Analysis of the Expansionary IP Regime 268

III. The Policy Outlook in Canada and the United States 270
IV. Conclusions 272
V. Recommendations and Questions for Future Research 273
i. Broadening Canadian Innovation Policy by Providing Greater Access to Information and a Larger Range of Incentives for Innovative Activity. 274
ii. Reintroduction and Passage of the *Federal Research Public Access Act* (FRPAA) in the United States 274
iii. A New International Framework to Support Defensive Publishing 275
iv. Establishing a World Innovation Organization 275
v. More Evidence-Based Innovation Policy 276
Notes to Chapter Eight: 276
Bibliography 278
Legislation 278
Canada 278
United States 278
Other Jurisdictions 279
Jurisprudence 280
Canada 280
United States 281
Other Jurisdictions 282
Patents 282
Canada 282
United States 282

Other Jurisdictions 283

International Agreements 283

Other Materials 284

Curriculum Vitae 332

List of Tables

Table 1: Pending USITC Section 337 Investigations Involving Prominent Smart Phone and Electronics Manufacturers 158

Table 2: Publication Method Used by Firms that Defensively Publish..... 246

Table 3: U.S. Utility Patent Fees as of Sept. 26 2011..... 248

List of Abbreviations

A2IM – American Association of Independent Music

ACTRA – Alliance of Canadian Cinema, Television and Radio Artists

BSA – Business Software Alliance

BRIC – Brazil, Russia, India and China

CAD – Canadian Dollars

CAFC – Court of Appeals for the Federal Circuit

CD – Compact Disc

CDO – Collateralized Debt Obligation

CFC - chlorofluorocarbon

CFI – Canadian Foundation for Innovation

CIPO – Canadian Intellectual Property Office

CONTU- National Commission on New Technological Uses of Copyrighted Works

CRIA – Canadian Recording Industry Association

CRTC – Canadian Radio-television and Telecommunications Commission

CTEA – *Copyright Term Extension Act*

DAX – Deutsche Borse AG German Stock Index

DMCA – *Digital Millennium Copyright Act*

DRM – Digital Rights Management

DVD – Digital Versatile Disc

EC – European Community

EEC – European Economic Community

EPA – Environmental Protection Agency

EPO – European Patent Office

E.U. – European Union

FBI – Federal Bureau of Investigation

FOSS – Free and Open Source Software

FRPAA – *Federal Research Public Access Act*

FTA – Free Trade Agreement

GAO – General Accounting Office (1921-2004), Government Accountability Office (2004-present)

GATS – General Agreement on Trade in Services

GATT – General Agreement on Trade and Tariffs

GDP – Gross Domestic Product

GI – Geographic Indicator

GNU – GNU's Not Unix

GPL – General Public License

GPTO – German Patent and Trademark Office

IANA – Internet Assigned Numbers Authority

IBM – International Business Machines

ICANN – Internet Corporation for Assigned Names and Numbers

ICT – Information and Communication Technologies

IFTA – Independent Film and Television Alliance

IIPA – International Intellectual Property Alliance

IP – Intellectual Property

ISP – Internet Service Provider

ITU – International Telecommunication Union

JPO – Japanese Patent Office

KIPO – Korean Intellectual Property Office

L'AGAMM – L'Accès Gratuit à la Musique est un Mythe

MB – Megabyte

MGM – Metro-Goldwyn-Mayer

NAFTA – North American Free Trade Agreement

NASA – National Aeronautics and Space Administration

NBER – National Bureau of Economic Research

NET – *No Electronic Theft (Act)*

NGO – Non-Governmental Organization

NIH – National Institutes of Health

NIPLECC – National Intellectual Property Law Enforcement Coordination Council

NRC – National Research Council Canada

NSF – National Science Foundation

OA – Open Access

P2P – Peer-to-peer

PCT – Patent Cooperation Treaty

PLoS – Public Library of Science

PRO-IP – *Prioritizing Resources and Organization for Intellectual Property (Act)*

PROTECT IP – *Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property (Act)*

R&D – Research and Development

RIAA – Recording Industry Association of America

RIM – Research in Motion

SAC – Songwriters Association of Canada

SIPO – State Intellectual Property Office of the People's Republic of China

SIR – Statutory Invention Registration

SME – Small and Medium Enterprise

SOPA – *Stop Online Piracy Act*

SR&ED – Scientific Research and Experimental Discovery (Tax Incentive Program)

SST – Supersonic Transport

TB – Terabyte

TIFA – Trade and Investment Framework Agreement

TPM – Technological Protection Measure

TRIPS – Agreement on Trade-Related Aspects of Intellectual Property Rights (1994)

UGC – User-Generated Content

U.K. – United Kingdom

U.N. – United Nations

UNESCO – United Nations Educational, Scientific and Cultural Organization

UPOV – Union internationale pour la Protection des Obtentions Végétale

U.S. – United States

USD – United States Dollars

USITC – United States International Trade Commission

USPTO – United States Patent and Trademark Office

USTR – United States Trade Representative

VCR – Videocassette Recorder

WCT – WIPO Copyright Treaty

WGC – Writers Guild of Canada

WHO – World Health Organization

WIPO – World Intellectual Property Organization

WPPT – WIPO Performances and Phonograms Treaty

WTO – World Trade Organization

Chapter One - Introduction

I. Introduction

Several significant political and economic changes over the past 30 years have changed the conditions for the production and distribution of intellectual goods. Politically neoliberalism has flourished, while the option of a Soviet style socialist alternative has crumbled. Economically the Fordist social contract between labour, the state and capital has been reshaped with the power of multinational corporations increasing *vis-a-vis* labour groups. International trade agreements have further enabled the transnational operation of capitalism. At the same time in 'advanced' Western countries, and the United States in particular, the services and informational sectors of the economy have increased in prominence coinciding with an increasing share of manufacturing carried out in the newly emerging (or newly industrializing) and developing world. The proliferation of information and communications technologies (ICTs), which are integral to the transnational coordination of capitalism, has drastically lowered the cost of production and distribution of intellectual works. In particular digitization has allowed what were once finite and scarce informational resources to be copied and transmitted with virtually no marginal cost. Intellectual property (IP) mechanisms have become increasingly important as a system for controlling and commodifying intellectual goods. These broad social changes have resulted in many declaring that there now exists a fundamental change in the nature of society, which is usually denoted as the emergence of an information society or information age.

The increasing importance of intellectual goods to capitalist wealth production necessitates, in the eyes of the producers and distributers of such goods and the owners of capital, an increased need for control over such goods in the form of intellectual property mechanisms. Traditionally, intellectual products were bound to physical containers, such as a book or vinyl record. Control over the physical embodiment of the intellectual goods ensured control over the content, but digitization has facilitated the separation of content and carrier. As a result numerous changes have occurred in the intellectual property

landscape. Traditional IP mechanisms have seen both an increase in term and scope of the protection afforded. This change is particularly significant in the case of patents and copyright. New IP rights have also been created including, as examples, protection for mask works (semiconductor integrated circuit design), ship hull designs, databases, plant varieties, domain names, geographical indicators, encrypted satellite signals, and the Olympic rings. Intellectual property protection has become integrated with international trade deals facilitating the use of powerful enforcement mechanisms used to ensure IP rights are protected. Finally, new legal and technological mechanisms have been established to further protect IP such as anticircumvention legislation and digital and information rights.

The result is not only more IP rights, but much more stringent protection of these valuable property devices that benefits large rights holders while reducing access to intellectual goods. At the same time economic and technological changes have facilitated the growth of a diversity of alternative ways of producing and distributing intellectual goods that do not take the form of traditional IP rights. As examples, Open Access (OA) publishing, Free and Open Source Software (FOSS), defensive publishing of scientific research, prizes, voluntary payment for content and levies on copying related devices and technologies have all emerged as alternative ways of distributing informational goods that cannot be categorized as intellectual property rights. Computing technology has dramatically lowered the cost of production of many types of intellectual goods, and the internet and other communications technologies facilitate not only low cost distribution, but also give rise to distributed and collaborative social arrangements that further facilitate the production and distribution of intellectual works.

Proponents of both IP and its alternatives argue that their respective approach to encouraging the creation of intellectual goods leads to innovation – a primary goal in society. Supporters of expanded IP rights argue that such rights are necessary to incentivize innovation, and that innovation is central to economic growth.[1] Critics argue expansive proprietary rights stifle innovation by fettering access and emphasize that many of the crucial dimensions of innovation (such as improvements to health and welfare) cannot be reduced to quantifiable economic variables.[2] Innovation is also an

important topic of concern for information society theorists. Proponents of information society discourse often celebrate the information age for having an increased level of innovative activity while failing to account for the significant role played by IP. It is necessary to examine the discourse on innovation in various theories of the information society to determine if innovation is simply conceived of in economic terms or if innovation implies some other form of political and social advancement. There is an important difference between valorizing innovation because it leads to increases in Gross Domestic Product (GDP), and encouraging innovative activity to bring about improvements in quality of life. This increasing emphasis on innovation requires critical scrutiny. It is necessary to go beyond the simple rhetoric of the term to examine why innovation is such an important goal, what the outcomes of innovation are and how best it can be incented.

II. Problem Statement

The result of political, economic and technological change is both an expansionary intellectual property policy regime and a proliferation of alternatives to the traditional IP mechanisms, all of which are aimed at generating innovation. Supporters of traditional IP devices believe that exclusionary rights that provide rights holders the ability to appropriate the full social value of their intellectual good are the optimal policy solution for encouraging innovation. This view is underpinned by a series of assumptions about human behaviour and a belief that pecuniary incentives are required to spur artistic and inventive activity.[3] Proponents of increased IP rights argue that the commodification of information is justified through the production of innovative goods and services that increase economic efficiency (through gains in productivity) and create wealth.[4] Finally, supporters of the expansionary intellectual property regime frequently adopt neoliberal rhetoric that views public goods including information as sources of market failure, while adopting an uncritical view that the commodification of information is an important economic dimension of the information age.[5] Considered collectively these traits represent the ideology of IP rights – the system of ideas including the incentives (self-interested, pecuniary gain), and outcomes (expansion of legal rights to exclude and the commodification of information bound in rhetoric of innovation and the information

society) that is used to justify the expanse of IP.[6] It is an ideology that is permeated by orthodox, neoclassical economic doctrine and a neoliberal political worldview that places wealth maximization ahead of other political, economic, social and ethical goals such as the sharing of knowledge and the use of such knowledge to improve the quality of life.[7] While wealth maximization is useful social goal,[8] there are several problematic aspects to the expansionary IP regime including decreased access to knowledge, increased social and economic stratification, and the entrenchment of dominant economic and political powers. By securing authors and inventors the full social value of their work,[9] IP incentivizes innovative activity; however, it is not the only mechanism for doing so, and one that comes with significant cost.[10]

However, concomitant with the expansionary IP regime there has been a flourishing of alternative mechanisms for producing and distributing intellectual goods. The term "alternatives to intellectual property" is actually quite broad encompassing a range of different ways to produce and distribute intellectual goods. Some alternatives seek to completely replace the IP system, for example patronage of artists by private individuals or groups and state financing of research. Other alternatives aim to address the limitations within the current IP system, without wholly replacing IP. Physical goods bundled with intellectual goods (a free T-shirt with the purchase of a CD) or service complements (such as technical support for purchased software) are examples of business models that still rely on the copyright regime.[11] Digital Rights Management (DRM) software and other technical protection mechanisms on their own could function as an alternative to the legal protection provided by IP. Furthermore, many alternatives are alternatives to a specific form of IP (usually patents or copyrights) and not the entire IP regime. Liebowitz and Watt note that alternatives to copyright take three general forms: those that allow copyright holders to benefit from copying (e.g. network externalities), mechanisms that limit copying (e.g. DRM), and mechanisms that aim to completely replace copyright (e.g. publicly funded rewards).[12]

Some of these alternatives such as FOSS and OA scholarly publishing have come about as a result of technological change and deal with specific kinds of intellectual goods. Other alternatives including prizes and patronage have long historical roots, but have

generated renewed interest.[13] While these alternatives have attracted significant scholarly attention, others such as defensive publishing and the private ordering schemes that use monthly fees on internet service providers (ISPs) to license infringing behaviour have not, despite their recent increase in prominence.[14]

These two alternatives require a critical interrogation to determine if they embody the same ideology as the expansionary IP regime or if they are characterized by a different ideology. If these alternatives are characterized by the same assumptions about human motives and encouraged to promote innovation for economic purposes then they represent only nominal alternatives to IP.[15] Conversely, if greater emphasis is placed on other incentive structures (including altruistic and reputational motives) and the outcomes that extend beyond wealth maximization, then these alternatives embody substantive alternatives to the IP regime. Without a substantive analysis of the ideology of these alternatives it is difficult to determine if defensive publishing and monthly ISP fees that allows non-commercial file sharing will exacerbate or relieve the problems created by expansionary IP policy. Policymakers are best served when they not only consider a full range of options for incentivizing innovation, but have a nuanced appreciation of how IP and its alternatives function.

Therefore what is needed is a new framework for analyzing alternatives to IP. Recognizing that it is impossible to examine the totality of all facets of alternative mechanisms for producing and distributing intellectual goods, this framework will focus on three critical dimensions – incentive structures used to encourage the production of intellectual goods, the outcome of such activity, and the ideological assumptions contained within the alternative. Each of these facets are integral to intellectual goods policy. An understanding of the motives that incentivize intellectual good production is necessary to ensure the production of such goods, while at the same time it is important to critically analyze in what way such goods facilitate innovation (i.e. is innovation simply an economic goal of creating new processes and products to increase productivity, or does innovation including increasing access to information and using that information to improve quality of life and decrease political, social and economic hardships). By critically engaging with these facets of intellectual goods it is possible to come to a more

holistic understanding of IP and its alternatives.

Finally, such a framework needs to account for the diverse explanatory theories of the information society that attempt to explain the numerous economic, political and technological changes that have facilitated the expanse and prominence of intellectual goods. The increased focus on innovation requires the development of intellectual goods, but it is necessary to question the deeper implications of the focus on innovation as a societal goal. If information society theorists simply stress innovation *as* economic growth then the focus on innovation embodies the same neoliberal principles as the expansionary IP regime. Conversely, if innovation connotes some sort of political and social advancement beyond economic growth it needs to be determined if these same objectives are being furthered by alternatives to intellectual property.

III. Justification

This study aims at critically assessing intellectual goods. In order to do so, it will examine and unpack both the concepts of incentives and innovation. It will also include a specific empirical analysis of the defensive publishing and the Songwriters Association of Canada's (SAC) proposal for a monthly ISP fee.[16] Careful scrutiny of these alternatives is needed not only to further our understanding of these alternatives,[17] but also to determine to what degree they embody the ideology of the expansionary IP regime.

A more nuanced understanding of IP and its alternatives is important and timely. Encouraging the production of artistic works and inventions is an important dimension of information policy; however, it is not simply enough to incentivize the production of intellectual goods. While artists and inventors should be rewarded for their work, this does not imply that they must be able to capture the entire value that work creates.[18] The incentives provided should be appropriate both economically[19] and ethically.[20] At the same time innovation must be promoted as well, though the term can and should involve more than simply the production of new goods and services for the purposes of improving productivity and creating wealth. The production and distribution of intellectual goods can lead to innovative solutions to political and social problems as well

as economic ones. By critically focusing on these two facets of intellectual goods, and using the specific cases of defensive publishing and the SAC proposal, this analysis will enhance understanding of how incentive structures can be used to further innovation.

A detailed understanding of intellectual property and its alternatives is particularly consequential given the important role intellectual goods play in a diverse range of human activities. Pharmaceutical and agricultural inventions form the building blocks of human life, but their overzealous protection through IP can result in diminished access and a resulting decrease in the quality of life. Educational materials whether in form of textbooks or webpages are central to learning, yet when commodified access is provided only to those who can afford to pay. Artistic creations are central to human culture, but large rights holding, content producing corporations have a primary duty to maximize shareholder value not enhance human culture. Though IP devices incentivize the production of many important goods, the control over access they provide can potentially undermine their usefulness as a policy tool.

Finally by critically examining the concept of innovation and its use by information society theorists the study will further understanding of how the term is used to advance various ideologies of intellectual goods. The critical examination of innovation is particularly important given the high degree of emphasis placed on innovation. As President Obama notes in the introduction to *A Strategy for American Innovation*, "innovation is more important than ever."[21] While nations adopt the rhetoric of innovation, it is unclear if such adoption is part of a broader neoliberal political agenda aimed at expanding markets, or if such a goal is aimed at improving quality of life and serving the public good.

There is an acute timeliness to this research with respect to intellectual property laws in Canada. Amendments to the *Copyright Act* that would bring Canada into compliance with the WIPO Copyright Treaty (WCT) are currently before Parliament.[22] Furthermore, the issue of business method patentability in Canada continues to be examined by Canadian courts,[23] which has the potential to significantly increase the scope of patent protection in Canada.[24] While expanding IP protection in Canada is likely to facilitate

the creation of new information markets, policymakers should also be mindful of the dangers of an expansionary IP regime and the role alternative methods of producing and distributing intellectual goods can play in stimulating innovation.

IV. Thesis

A simple differentiation between traditional IP rights and alternatives on the basis of their legal status is insufficient because some alternative methods for producing and distributing intellectual goods are based on the same underlying assumptions, principles, and rhetoric as IP mechanisms and will further exacerbate the problems created by the expansionary IP regime. Furthermore, it is insufficient to examine only incentives or only outcomes – the two concepts and their interaction must be considered. Only a holistic, critical theory of intellectual goods that examines these two central facets of the economic and political dimensions of intellectual goods can identify the proper basis of differentiation for determining which so called alternatives to intellectual goods are meaningful alternatives. Recognizing these points, this analysis proceeds from the general thesis that:

> Intellectual property rights possess two specific characteristics with regards to incentives and outcomes. IP is incentivized through a self-interested pecuniary motive, and the outcome, which may be generally classified as innovation, necessarily includes a legal right to exclude that limits access and is focused on wealth creation. Therefore, true substantive alternatives to IP must possess an alternative ideology that emphasizes social goals beyond wealth maximization. The production of true alternative intellectual goods must come from more than simple pecuniary motive and its outcomes should include enhancing access to information.

There are also three specific sub-theses each addressing a specific chapter of the dissertation. The primary argument for the incentives chapter (chapter 4) is that the focus on pecuniary incentives to stimulate the production and distribution of intellectual goods is misplaced as there are already numerous extant incentives for the production of intellectual goods, and the primary goal of policy for the intellectual goods should be

creating incentives to ensure the distribution and access to intellectual works. The central argument of the innovation chapter (chapter 5) is that innovation is not simply the production of new goods and services. Innovation is a far broader concept and must reflect that innovations should not simply be new but an improvement on what exists, innovation also includes organizational structures; it is a complex process that deals with not only with the production of new ideas but the diffusion of the ideas, and most importantly also includes changes to values and social norms. The key argument for the ideology chapter (chapter 6) is that neoliberal political ideology and neoclassical economic thought have narrowly framed innovation as a means for generating wealth and gains in productivity. This orientation has undermined other important dimensions of innovation – namely, the role of innovation in facilitating political, moral, and social progress. Information society proponents also often promote a limited conception of innovation without considering the full effects of exclusionary rights (which are usually associated with and underpin innovative activity). The failure to fully examine the role of IP, while at the same time lauding innovation, facilitates an overly optimistic account of the information society. In turn this positive information age rhetoric is then easily employed by neoliberal thinkers, policymakers and corporations to justify a vision of a society that extols efficiency, wealth production and self-interest with a significantly lessened concern for moral, social, political and environmental progress.

Recognizing that a substantive body of literature exists on prizes, Free and Open Source software and Open Access publishing, these alternatives will not be analyzed in detail as such work has been done by others. In order to determine the validity of the general thesis, two cases will be examined, which scrutinize intellectual goods that have received less scholarly attention. These alternatives are defensive publishing (also called pre-emptive publishing), and the monthly ISP proposal by the SAC.[25] In addition to being understudied these cases are also timely and representative of the diversity of alternatives to IP.[26]

Finally to situate IP and its alternatives within theories of the information society it is necessary to determine the true nature of the relationship between intellectual goods and innovation. To facilitate this analysis the work of two important theorists of the

information society will be drawn upon to examine their treatment of the concepts of IP and innovation. The examination will focus on the work of Manuel Castells and David Harvey who have both examined the broader political, economic and social changes over the past forty years.[27] Both Harvey and Castells attempt to explain the numerous political and economic shifts over the past 40 years through their theories with Castells emphasizing the importance of innovation, while Harvey's view posits that IP is an increasingly important tool of neoliberal states for extending the power of capital. Because these two theorists' views contrast so sharply, they serve as useful explanatory theories of the information society to examine IP and its alternatives against.

V. Theoretical Framework

A. Critical Theory and Overcoming Disciplinary Boundaries

The framework in the study is a multi-faceted analysis of the incentive structures and innovatory outcomes involved in intellectual goods production and distribution, and discourse on the information society including both theoretical discussions and empirical analyses of cases. While the specific framework for the analysis is new, the analysis itself is informed by scholarship in a number of fields including law, economics, and information science. Although the study does not belong to any one academic discipline, it can be situated as part of the broader area of information policy, which focuses the policies that influence the creation, dissemination, processing, storage and destruction of information.[28]

The analysis is theoretically informed by Critical Theory, specifically drawing on the work of Douglas Kellner as well as Raymond Morrow and David Brown. Critical Theory is a supradisciplinary method of analysis focusing on the interconnections between philosophy, economics, politics, culture and society.[29] Critical Theory recognizes that important issues cut across disciplinary fields, and also views academic disciplines themselves as artificial.[30] The work draws on scholarship on intellectual goods from a range of academic disciplines and also situates intellectual goods within broad sociological theories on the information society. As such, the supradisciplinary nature of Critical Theory is essential as it allows for overcoming disciplinary fragmentation.[31] The

study does not simply examine intellectual goods in economic or legal frames to the ignorance of broader social and political contexts. Rather, this analysis contextualizes the ascending importance of IP and its alternatives within the broader socio-economic changes that have occurred over the past 40 years. Given the diversity of disciplinary approaches to intellectual goods and the need to contextualize such scholarship within broader theoretical perspectives, the analysis cannot be conducted within a single disciplinary frame and as such must be supradisciplinary in nature. Furthermore, it is important to note that supradisciplinarity is distinct from intradisciplinarity. The latter implies the simple combination of empirical and theoretical insights from different disciplines. In contrast supradisciplinarity requires careful scrutiny of both the normative and positive claims of various disciplines as part of the integration of empirical findings.[32]

However, it is insufficient to simply declare that the work is supradisciplinary without providing justification of why certain theoretical approaches are used. The work draws on Critical Theory because issues including commodities and consumption have historically be an area of inquiry.[33] Traditionally many critical theorists have viewed commodities as seductive and manipulative and their consumption as a fetishistic activity; however, Kellner has stressed that this simplistic, negative view needs to be reconsidered as some commodities are life enhancing and fill vital needs.[34] This is particularly relevant to intellectual goods, as many important products (from pharmaceuticals to educational textbooks) are incentivized through intellectual property rights.

A second important dimension of Critical Theory is its normative viewpoint; it not only critiques the existing society but emphasizes and envisions new possibilities.[35] Substantive alternatives to IP, and only substantive alternatives not nominal ones, are capable of addressing the problems of the expansionary IP regime (commodification of information, diminution of access and the extolling of self-interest). Thus the analysis is theoretically situated within Critical Theory both as a means of examining the subject matter of intellectual goods, as well as providing a theoretical perspective for supporting substantive alternatives to IP.

In addition to Critical Theory this analysis is influenced by work in the area of law and economics (also called the economic analysis of law). Law and economics is employed because such scholarship has been influential with those supporting the expansionary IP regime.[36] This analysis makes extensive reference to Law and Economics scholarship and the works of Richard A. Posner,[37] William M. Landes,[38] and Edmund W. Kitch[39] in particular. Posner, Landes and Kitch, who are among the leading law and economics scholars on IP, offer both important empirical and theoretical insights into IP. However, it is also important to note that their work is underpinned by the normative position of law and economics scholarship. Law and economics aims to use law to promote economically efficient[40] solutions to legal problems.[41] By juxtaposing the normative approaches in Critical Theory and law and economics, the analysis is able to draw on empirical insights from both fields while accounting for and scrutinizing the normative framework from which those empirical findings arise. In addition to drawing on law and economics scholarship the framework is also informed by a series of critical intellectual property scholars including, Christopher May,[42] Peter Drahos,[43] and Samuel Trosow.[44] May's work critically examines the interlinkages between the global protection of IP and the rise of neoliberalism,[45] while Drahos provides a detailed account of the origins and rise of the expansionary IP regime.[46] Trosow succinctly characterizes the ideology of IP and he also notes the role incentives and outcomes play in IP. Trosow has three salient points on the role of incentives in the critical analysis of IP. First, the issue of incentives requires more analysis.[47] Second, critical IP policy must de-couple the notion of incentives from innovation,[48] and third, economic incentives are the result of a particular social structure.[49] Recognizing these points it is necessary to further develop the critical theory of intellectual goods that is capable of examining a range of motives for the production of intellectual goods and categorize these incentives appropriately. The scrutiny of incentives is particularly important to the analysis of intellectual goods that do not take the form of traditional IP rights as many of these alternatives do not have a direct pecuniary incentive. Such an analysis must also be cognizant of the relationship between incentives and the outcomes of intellectual activity. The fundamental question is not, 'do alternative intellectual goods promote or facilitate innovation?' All intellectual goods have the potential to further innovation. The primary question is one of outcomes - 'does

the intellectual good emphasize access, or does it emphasize exclusion and commodification?'

In addition to the legal scholarship of law and economics and critical IP scholarship, this study makes extensive use of both orthodox and heterodox economic theory. Both Joseph Schumpeter and Kenneth Arrow's theories of innovation are examined in detail at the beginning of chapter 5. These theorists are drawn on not only because the Schumpeter-Arrow debate on market structure and innovation has attracted considerable scholarship, but more importantly because these two theorists offer several important insights on the nature of innovation and the role of IP.[50]

Neoclassical economic theory from several theorists including Milton Friedman and Gary Becker is also utilized. Neoclassical economic theory has become increasingly influential in legal and political decisions on a range of subjects including IP.[51] The study explicitly examines the evolution of the neoclassical model of human behaviour, *homo economicus*, and the weakness of developing policy based on such a limited and abstract sketch of humankind.[52]

Discussions on innovation draw not only on the works of Castells and Harvey, but also on a series of scholars who have critically examined the interaction between IP rights and innovation including Josh Lerner, Adam Jaffe, Robert Merges, Wesley M. Cohen, and Bronwyn Hall among others. These scholars have provided crucial empirical findings that demonstrate the weakness of IP as an incentive to innovation.[53] Michael Heller's tragedy of the anticommons thesis and Carl Shapiro's problematization of the patent thickets are critically examined. While these approaches provide important theoretical insights on the dangers of fragmented and expansive IP rights, it must also be noted that their theories do not have extensive empirical support.[54] Heller and Shapiro's work is complemented by an examination of scholarship on the commons from Yochai Benkler, David Boiller, and James Boyle. Through an analysis of the scholarship of these authors and a discussion of open source software and open access scholarly publishing, it is demonstrated that alternatives to IP can produce substantial amounts of innovation.[55]

Although this represents a broad range of scholars from a variety of disciplines, this

analysis aims at overcoming academic fragmentation by using Critical Theory to focus on the relationships between intellectual property and its alternatives with specific emphasis on the facets of incentive structures and innovation in their political, economic, social and legal dimensions. By decoupling incentives and innovation and then analyzing intellectual goods in this manner it becomes possible to determine which so-called alternative intellectual goods represent substantive alternatives to IP. After such a classification it is then necessary to discuss the primary goal of intellectual goods – the furthering of innovation – within the context of theories of the information society.

B. Normative Framework

The supradisciplinarity of Critical Theory represents only one half of the reason for its use as the theoretical frame. The second and more important element of Critical Theory is that it posits that normative questions, questions of the form 'what ought to be,' can and should be subject to scrutiny.[56] The scrutiny of normative claims is essential to the study. Not only is the critical examination of normative theories necessary to integrate the theories and empirical findings of different disciplines, it is needed to reflexively link such findings to a course of action (in this case policy recommendations).[57] Furthermore normative issues have profound ideological implications, particularly in the area of policy analysis.[58] This analysis specifically aims to explicate the ideological dimensions of innovation, neoliberalism and theories of the information society.

The normative framework used in this study explicitly rejects the normative view of law and economics (that legal problems should be addressed in an economically efficient manner), and ideological underpinnings of law and economics and neoclassical economics. The generation of increased wealth and productivity, while important, are not a justification for the commodification of information and the diminution of access to intellectual works. Innovation is an important policy objective; however, it must be used to address political, social, and moral problems and not only economic issues. It is also crucial to note that innovation should not be blindly celebrated as some innovations produce harmful and unforeseen consequences. Rhetoric on innovation and its positive connotation should not be used as a guise to advance policies that disproportionately

benefit those in already privilege positions whether they are nations, corporations or individuals.

Drawing from Critical Theory, the normative framework in this study aims to promote progressive change. The framework employed aims at determining which alternatives to IP are best suited to overcome the problems of the expansionary regime. The outcome of this study, its policy recommendations,[59] is geared toward ensuring greater support for substantive alternatives. It should be noted that while it is a laudable goal to conceive of a world no longer bound by the concepts of ownership through exclusive rights and waged labour, such a goal is not immediately realizable in the near or even medium term. However, greater support for substantive alternatives, which reject the ideology of IP, can contribute to the long term innovation in social norms and values that will be necessary to realize such a future.

C. Incentives for Producing and Distributing Intellectual Goods

Incentives have traditionally been a topic of central concern to scholars of intellectual goods. Justificatory theories of intellectual property of both utilitarian and Lockean strands place prominence on the role of incentives.[60] The U.S. Constitution, the document from which all American intellectual property law emanates, clearly recognizes the role incentives play in the production of intellectual goods,[61] and both patents and copyrights are premised on the concept of incentivizing creative and inventive behaviour by exchanging the product of such labour for a legal right to exclude. A similar justification for intellectual property is given in Canada: "the premise underlying intellectual property (IP) throughout its history has been that the recognition and rewards associated with the ownership and invention of creative works stimulate further inventive and creative activity."[62] While direct pecuniary incentives are the dominant incentivizing system, a broad range of other incentives exist. Intellectual goods are produced not only for financial gain, but also for recognition, political and religious ends, and altruism. Furthermore, inventive and creative behaviour has taken place throughout human history and is a natural trait of the human species.[63] For intellectual goods that will be sold as or embodied in commodities (e.g. most patented products),

being the first to market is also a strong incentive in the creation of such goods. It is necessary to recognize all of these motives drive both individuals and groups to produce and distribute intellectual goods. In many cases more than one motive may be at work. A critical theory of intellectual goods must not only account for the presence of these motives, but must also have a way of examining to what degree each motive is emphasized. For example, Nobel laureates receive both a medal and a substantive cash prize, but the recognition of being named a Nobel laureate is equally if not more important.

In examining the range of motives for producing intellectual goods it becomes obvious that a spectrum of incentives exists. On one extreme are those motives that are most self-interested, and on the other extreme are those motives that are informed by a common/public interest. It is important to also recognize that intellectual goods may be produced as the result of not one single incentive, but a range of incentives at a time. Someone may author a work to seek recognition, are naturally creative and desire some financial remuneration. However, it is clear that the intellectual property system is based on a pecuniary incentive.[64] Thus, while a range of motives may factor into the production of intellectual property, the primary motivation and justification behind such a system is pecuniary gain facilitated through exclusionary rights.

Examining alternatives to intellectual goods it is clear that some are also predicated on providing a financial incentive to innovate – most notably a prize system. The desire for recognition, altruism, the advancement of political ends, natural creativity and inventiveness, and a desire to exchange ideas and knowledge with others also incentivize the creation of intellectual goods. Of course self-interest plays an important role in some of these motives, most notably recognition and the advancement of political ends, but in these cases any pecuniary gains play a secondary role. Altruism and the desire to share information and knowledge with others are the least self-interested motives, and should be perceived as emanating from a common/public/general interest. It should also be noted that even altruism and the desire to share with others possess a degree of self-interest of the creator insomuch as one derives a feeling of satisfaction from doing good unto others.[65]

While a range of incentives exist for encouraging the production of intellectual goods, what is specifically unique about the expansionary IP system is not that it includes a pecuniary motive (several alternative intellectual goods systems also include some pecuniary reward), but the degree to which this incentive is emphasized. The current IP system is premised on the assumption that pecuniary gain is not *an* incentive but *the* incentive for producing intellectual goods.[66] It conceives of intellectual goods creators as instrumentally minded commodity producers.[67] The instrumentalist, economic conception of IP is most pronounced in the U.S. system given its specific lack of moral rights,[68] and the increasing tendency to view IP in solely instrumentalist terms is reflected internationally in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).[69] The TRIPS Agreement, which was signed as part of the series of trade agreements establishing the World Trade Organization (WTO), not only requires WTO members to stringently protect IP using minimum levels of protection based largely on American standards, but also contains the deliberate exclusion of a requirement for member states to adhere to Article 6*bis* of the Berne Convention (which provided for an authors' moral rights).[70] The exclusion of authors' non-economic moral rights in TRIPS evinces that copyright law has adopted an increasingly instrumentalist economic standing reflecting the expansionary trend in IP to treat such rights in solely economic terms. Given the expansionary IP system's exclusive focus on the pecuniary incentive it then becomes possible to assess alternatives in this regard. If a so-called alternative relies solely on the prospect of financial gain to incentivize intellectual good creation then it cannot be considered a real alternative in regards to the incentive structure it employs. True alternatives should draw on more than pecuniary incentive to promote the creation of intellectual works.

D. Outcomes – Access or the Right to Exclude

A simple analysis of incentives is insufficient without reference to the outcomes. The analysis of outcomes has two central dimensions – the presence or lack of an exclusion mechanism and the nature of the innovative outcome. Exclusionary power is a central aspect to IP, while prominent alternatives to IP (Free and Open Source Software, Open Access publishing and prizes) place specific emphasis on ensuring access. An analysis of

the degree of access provided by alternatives to intellectual goods is a second, central facet of the analysis.

Though the IP system encourages the production of intellectual goods, part of its design is to provide authors and inventors with an exclusion mechanism to protect their intellectual property. The justification behind such exclusion mechanisms is that they are necessary to prevent groups and individuals from enjoying benefits from the inventive and creative work of others without bearing the cost (the free-rider problem).[71] Exclusion mechanisms serve a self-fulfilling role in IP – by introducing artificial scarcity they create a marketable commodity and produce a financial incentive for creative and inventive behaviour.[72] The right to exclude others from use is not only an important, but central mechanism to intellectual property rights.[73] Although the IP system does spur inventive and creative behaviour one of its most significant features is its requirement to do so through the use of legal exclusion mechanisms.

Given the expansionary IP regime's focus on exclusion, true alternatives should lack such mechanisms and encourage access. For many alternative intellectual goods access plays a central role. As examples, Open Access materials are freely accessible,[74] Free Software and Open Source software provide access to the source code,[75] and prize systems tend to place knowledge in the public domain.[76] Proponents of these systems argue that increased access results in more innovation.[77]

In many cases supporters of alternatives draw on the concept of the commons and an information or knowledge commons in particular,[78] while others highlight the danger of too many exclusive proprietary rights.[79] The idea of common property to which individuals have a right of access unlike private and state property,[80] serves as a useful mechanism for describing a number of resources from common farm land, fish stocks, the electromagnetic spectrum and information.[81] Though similar to many natural commons, the information commons is particularly unique: not only is information inherently non-rival in consumption and non-excludable, information tends to become more useful as it is shared (or in economic terms it possesses a strong network effect).[82] In particular both Open Access scholarly publishing and Free and Open Source Software

have a strong intellectual linkage with the concept of the commons.

Access oriented discussions do, however, contain some important qualifications. The term is often employed but with differing meanings; to some 'access' implies available at no cost, while for others the invocation of access applies that the information is available without restrictions or exclusions.[83] The Free Software movement, founded and launched by Richard Stallman, notes that the use of "free" refers to the concept of liberty rather than price; it is, "'free' as in 'free speech', not as in 'free beer.'"[84] It should also be noted that the concept of access and the limitation on restrictions is specific to distribution and not necessarily use. Creative Commons licenses, a simple and common legal licensing system that allows authors and creators to release their works to the public with less restrictions than copyright but without placing the works completely in the public domain, contain no restrictions on distribution, but do allow authors to choose from a variety of restrictions on use including the ability to bar usage for commercial purposes or derivative works.[85] Willinsky notes at least 10 differing variants of OA scholarly publishing, each of which possesses a different economic model.[86] While there is considerable heterogeneity within access-oriented alternatives to IP, these alternatives are unified by their lack of exclusion mechanisms.

Recognizing the differences in the treatment of access/exclusion it becomes possible to create a second spectrum for the outcomes of intellectual goods. On the one hand there are those that facilitate broad access like Open Access publishing, FOSS and prizes, and on the other hand are intellectual property mechanisms that emphasize the legal right to exclude. In the same way true alternatives should not simply emulate the incentive structure of the expansionary IP regime, they should not produce the same outcomes. As such true alternatives to IP should facilitate some sort of access to the informational content of the intellectual good. In some cases the access facilitated is direct and costless access to the informational good itself (such as in OA publishing), while in other cases the final good itself may still have a cost, but the informational aspects of the goods are accessible (such as the source code in FOSS).

E. Outcomes - The Nature of Innovation

While the presence or lack of an exclusion mechanism is indicative of the degree to which an intellectual good represents an alternative to the IP system, an equally important outcome is the role these goods play in society at large. Both IP and its alternatives aim at addressing an important societal goal – facilitating innovation; however, the term 'innovation' has a specific, ideologically loaded conception within IP. IP and its alternatives are not incentivized without good cause; they are encouraged because they bring about new processes, products and methods. For the proponents of IP innovation is construed in an economic sense and they extoll the production of new products and processes for the purpose of wealth maximization.[87] Other dimensions of innovation such as the ability of innovation to improve human welfare and quality of life are seen as secondary.[88]

While the expansionary IP regime views innovation in solely economic terms, proponents of alternatives tend to emphasize the broader social improvements generated by information. In cases where the discourse of economics is employed, authors adopt a clearly socially oriented viewpoint (focusing on social and consumer welfare).[89] And in general the social benefits of innovation, which are extremely difficult to quantify and measure, are highlighted as the primary reason for encouraging the production of intellectual goods in an accessible manner.[90] Substantive alternatives to IP should embody a view of innovation that recognizes its broader political and social dimensions beyond productivity and wealth maximization.

F. Towards a Conceptual Mapping of Intellectual Goods

Taken collectively these traits can be used to create a conceptual mapping of intellectual goods. The expansionary IP regime is marked by an exclusive focus on economic incentives, the limitation of access through exclusion mechanisms, and an emphasis on innovation as a means for wealth production. If a so-called alternative intellectual good shares these two characteristics then it is only an alternative in name and not in character and ideology.

Substantively alternative intellectual goods should facilitate access and their creation be incentivized through a variety of motives and for more than solely economic purposes. Substantive alternatives may still have an economic cost; however, cost and other technological and legal mechanisms are not used simply as means to restrict access. The incentive structure may include a financial reward, but not rest solely on a view of humans as motivated only for instrumentalist purposes and wealth maximizing means.

What emerges from combining the concept of incentives and outcomes is a conceptual map of intellectual goods marked on either end by these two characterizations. With this conceptual framework it will be possible to analyze defensive publishing and the SAC proposal to determine if they are largely reflective of the ideology of the expansionary IP regime, or if they represent some sort of substantive alternative.

Finally, it is important to state that substantive alternatives are not necessarily anti-capitalist in nature. While the commodification of information within capitalist societies does limit access, in many ways this treatment of information is less restrictive than other authoritarian societies (for instance, Soviet photocopiers were locked in special rooms which were sealed with wax each evening to prevent any unauthorized copying).[91] Substantively alternative intellectual goods can have a synergistic relationship with capitalist markets by either creating markets for complementary markets or increasing the value of existing goods through network effects.[92] While not anti-capitalist in nature, substantive alternatives are opposed to the recent (1970 onward) change in the intellectual property regime that focuses on expanding private ownership of intellectual goods.

Summarizing the conceptual mapping of intellectual goods with respect to incentives and outcomes, the expansionary intellectual property regime is characterized by:

- An almost exclusive focus on pecuniary incentives
- The limitation of access through exclusion mechanisms for the purposes of controlling and commodifying information and an emphasis on wealth maximization

Conversely, substantively alternative intellectual goods possess:

- A range of incentives for creation, including both financial and non-financial motives
- An emphasis on facilitating access by limiting legal and technological restrictions on the use of information and making such information available to improve the human condition

Given these two conceptions of innovation, which are reflective of the characteristics and ideology of the differing approaches to intellectual goods, it also possible to examine theories of the information society and the use of the term innovation within these theories. If innovation is promoted within a theory of the information society primarily as a mechanism for encouraging economic growth, then it is clear that the logic and ideology of the IP system is being advanced. Conversely if the aims of innovation are cast in broader social and political terms, then theory of the information society reflects the character and ideology of substantive alternatives of IP. This technique of analyzing theories of the information society is particularly useful when a theory contains only a limited discussion on the role of intellectual property rights. One needs to move beyond an uncritical discussion of innovation to determine the underlying assumptions behind this concept and determine their relationship to IP and its alternatives.

G. Innovation and Theories of the Information Society – Castells and Harvey

The declining share of manufacturing in the U.S. and other economies and rise of financial, information and service sectors following the period of post war prosperity have attracted the attention of many scholars who seek to explain the change. A variety of theories have been employed to describe the emergence of a so-called 'information society.'[93] Though information and innovation are central to discourses on the information society, an explicit discussion of the role of IP and its alternatives is not always present. This section provides a general overview of some of the theories of the information society and a more detailed discussion of the writings of Daniel Bell, Manuel Castells and David Harvey.

i. Overview and General Examinations of Theories of the Information Society

Discussions on theories of the information society usually begin by highlighting Daniel Bell's *The Coming of Postindustrial Society: A Venture in Social Forecasting*, despite the fact that more critical works on the subject predate Bell's.[94] Though the subject has been approached by a range of authors,[95] common themes permeate the literature: a social revolution comparable to the social changes experienced in the Industrial Revolution, the emergence of a new postindustrial/information economy, a shift in political practices and the nature of community, and the decline of the state.[96] In an effort to support their claims, theorists often point to changes in: the prevalence of ICTs, occupational shifts away from manufacturing, the increasing economic value of information, the pervasiveness and importance of networks (both social and technological), and an increased emphasis on the production and interpretation of signs and symbols.[97] While a number of scholars emphasize the degree to which the modern society represents a break from industrial capitalism, a diverse body of critical literature suggests that many of the overarching and most significant themes of industrial-capitalism are still present in the information society.[98] Information society proponents tend to engage in naïve technological determinism and information exceptionalism, which overemphasizes the role of information in modern society while downplaying the fact that information has been significant throughout history.[99] Despite the contested academic discourse, the concept of an information society has had a powerful influence on policy makers from Japan,[100] to the E.U.[101] and the U.S.[102] and Canada.[103] However, policy makers, like information society advocates, have tended to adopt a narrow and simplistic, technologically determinist approach privileging information and communications technologies.[104]

Given the increasing prominence and rhetorical power of theories of an information society, it is necessary to interrogate those theories, and in the context of this study such an investigation must have a particular emphasis on the treatment of innovation and IP. The focus on the concepts of change and technology naturally intersect with the idea of innovation. While innovation and the role of information are explicitly discussed by information society theorists, an important element that is implicated in this discussion

and must be scrutinized is how intellectual goods are to be produced and distributed. With the increasing focus on information and innovation, theories of the information society must also account for IP and its alternatives.

ii. Manuel Castells' Theory of the Network Society

Castells' views on the informationalization of society are contained in his three volume work, *The Information Age* and subsequent writings. He differentiates between modes of production (capitalism and statism) and modes of development (industrialism and informationalism),[105] adding that informationalism and capitalism are linked, but that neither is dominated by the other.[106] In this regard Castells' work is not dissimilar from Bell, and both put knowledge at the centre of productivity.[107] Castells argues that this new mode of development is oriented towards knowledge production unlike industrialism that was growth oriented.[108] Castells emphasizes that informationalism is more flexible than industrial society. Both workers[109] and production processes are more flexible in informationalism.[110] Flexibility is also reflected in what Castells argues is the prominent new organizational structure, the network firm.[111] While networks take on more significance, Castells suggests the bargaining power of unions is declining,[112] and state's traditional basis of power, a monopoly on violence, is being eroded by networks of criminals and terrorists.[113] Despite their declining power, nation states retain their influence.[114]

Castells' model of informational capitalism offers some distinct advantages. By constructing axes of development and production Castells is able to argue that the increasing informationalization of society is a profound shift, but he does not suggest that this shift comes in the form of a move away from capitalism. The breadth of Castells' model is another advantage. He connects numerous processes to informationalization ranging from environmental movements[115] to the integration of the E.U.[116] Castells' analysis reveals informationalism's ability to act on a wide variety of social structures and institutions. A third strength of Castells' analysis is his focus on how the increasing informationalization of society produces patterns of resistance. Castells identifies how movements such as the Zapatistas and the American militia movement are not only

reacting against informationalization, but also employing information technology in their resistance.[117] The recognition of resistance movements is important because it highlights the dialectical nature of the relationship between the mode of production and resistance. Informationalism not only produces its own discontents, it also provides them new ways in which to resist.

Many of the weaknesses of Daniel Bell's analysis can also be leveled at Castells.[118] In many regards there is little difference between the two. Both stress the importance of knowledge in productivity, and both suggest that the major change that has occurred is not a shift away from capitalism, but a shift away from industrialism. Both also express a degree of technological determinism (though Bell is far more determinist than Castells).[119]

Castells' model is not without its own unique difficulties, which are numerous. His argument that industrialism was growth oriented is problematic in that it neuters the concept of the mode of production from any connection to politics. While industrialism did have an economic growth orientation, the 20th century is ripe with examples where the primary focus on industrialism is service within a military-industrial complex. The evisceration of the connection between the mode of development and the political realm is even more important in informationalism. If society's principal focus is on knowledge accumulation, then the political dimension of informationalism is crucial. It is not unreasonable to conceive of a political system oriented on knowledge production in the form of surveillance.[120] Who controls the information being produced and who has access will be the fundamental questions, and they are also political ones. To separate the mode of development from the political weakens Castells' model.

An analysis of Castells' work is relevant because he places specific emphasis on the importance of innovation in informationalism, and in doing so draws on one of the earliest and most important innovation theorists, Joseph Schumpeter. Castells argues that the spirit of informationalism is the spirit of 'creative destruction.'[121] The heart of Schumpeter's creative destruction was the entrepreneurial drive to innovate new goods and services.[122] Thus, for Castells innovation is the ethos of the network society calling

it, "the primordial function."[123]

Castells pays little attention to the role of IPRs in *The Information Age* only noting that the incorporation of TRIPS into the global trade system helps ensure the dominance of multinational corporations.[124] He does discuss the subject in some of his more recent work noting that efforts to protect IP undermine privacy.[125] Though he claims that one of the primary factors of innovation is new knowledge, this discussion takes place without an explicit discussion of the role of IP.[126] Castells' theory of a network society places innovation at its centre, but his discussion of the role that IP plays in this regard is severely lacking. In this regard his work is typical of proponents of the information society – it stresses the (largely technical) benefits of innovation, but presents only a cursory discussion of the role of IP and commodification of information in achieving this innovation. Castells' omission of a substantive discussion is notable. Furthermore, by avoiding the subject while embracing the concept of innovation, he ignores the role of IP in facilitating exclusion. Holistic theories of the information society should account for the role played by IP and its alternatives, and given Castells' negligence in critically examining the connection between IP (and its alternatives) and innovation, it is necessary to examine his theory of informational capitalism to determine how this omission facilitates his extolling of innovation.

iii. David Harvey's Theory of Flexible Accumulation

David Harvey expresses many of the same views on social relations and the logic of capitalism as several other critics of the information society; however, his concept of flexible accumulation makes him distinct among this group as he does not see the changes in society as a simple extension of existing capitalist trends. Like Castells, Harvey stresses that the rigidities of Fordism have given way to increased flexibility in production and consumption.[127] However, Harvey does not place information at the centre of the decline of Fordism; rather he asserts the inherent contradictions in the Fordist-Keynesian paradigm that caused its collapse.[128] Harvey's model possesses some elements of post modernism, such as a focus on aesthetics,[129] but in a similar vein to other critical theorists such as Schiller, Habermas and Giddens,[130] he argues there are

more continuities than difference between the modern and post-modern period.[131] Harvey places specific emphasis on the role of information in coordinating and facilitating control.[132] He also stresses the increasingly individualistic and consumptive nature of society.[133]

Harvey's model has several advantages. Like Castells and Bell he accepts the premise that a change has occurred in industrial capitalism; however, he differentiates himself emphasizing that such a change is a shift of the accumulation of surplus value. Working from a Marxist perspective he views capitalism as dynamic, and he also focuses on social relations. As such his model does not focus on a single driving force propelling society forward, but on the range of forces. His model shows considerable breadth covering subjects from shifting perceptions of space and time,[134] to the aesthetic[135] to the role of finance.[136] And though he covers diverse subjects, he is careful to link them to the regime of flexible accumulation. Harvey's model possesses one limitation for those seeking to examine the informationalization of society - knowledge and information are not at the centre of his focus. While this is a limitation, it should not be considered a weakness. Harvey's approach shows that it is possible to assess the range of changes occurring in society without a central focus on information. Harvey does discuss the role of IP within the neoliberal state.[137] Capital still has primacy over information. For Harvey increasing informationalization is but one of many factors driving change in society.

Though Harvey does not place central emphasis on information, he still engages both the subject of innovation and the role of IP. He argues that Schumpeter obscures the real motivation for innovation - the pursuit of profit – and that the Schumpeterian view of the individual innovator has mythologized the entrepreneur.[138] The mythologizing of entrepreneurial ingenuity results in a fetishistic belief that all problems have technological solutions.[139] Harvey goes even further in his criticism of innovation. He notes that the focus on the development of new products and services results in the production of goods for which there exist no naturally occurring market or demand.[140] He goes on to argue that innovation is destabilizing noting:

> Talented interlopers can, furthermore, mobilize technological innovations to undermine

> dominant social relations and institutions; they can, through their activities reshape common sense to their own pecuniary advantage. There is an inner connection, therefore, between technological dynamism, instability, dissolution of social solidarities, environmental degradation, deindustrialization, rapid shifts in time-space relations, speculative bubbles, and the general tendency towards crisis formation within capitalism.[141]

In one way both Castells and Harvey are similar in that they afford innovation a central role; however, the two possess radically different views as to the benefit/peril posed by innovation.

Harvey also explicitly discusses the role of IP. IP, and patents in particular, play a central role in the encouraging of innovation, which is a key goal for the neoliberal state.[142] He claims that IP encourages rent seeking and the depletion of natural commons.[143] Unlike Castells, Harvey obviates the connection between IP and innovation.

Contrasting and comparing the work of Harvey with that of Castells and Bell, with particular emphasis on their treatment of IP and innovation is not only illuminating in its own right. The significant differences between the authors provide a suitable basis for discussing the concepts of innovation and IP within theories of the information society. Although the three authors did not write at the same time this does not preclude comparison of their works. Bell's work comes nearly a generation earlier than that of Castells and Harvey, yet his work is foundational. Furthermore, the 25th anniversary edition of Bell's seminal *The Coming of Post-Industrial Society* contains a lengthy introduction written in 1999 where he reaffirms many of his original arguments.[144] While the thesis concentrates on Castells' *Information Age* trilogy written at the end of the 20th century, it also examines his more recent writings over the past decade particularly with reference to his treatment of IP. In contrast the works of Harvey examined span a broader period of time (1982-2010), but are consistent in their critical treatment of the development of capitalism since the early 1970s. By juxtaposing the works of Bell, Castells and Harvey and their treatment of innovation and IP new insights are provided on information society discourse and its relationship to broader trends within capitalism.

VI. Objectives and Research Questions

In order to examine the thesis and sub-theses the following research questions will be employed:

1) To what degree does the Songwriters Association of Canada's proposal for a monthly ISP fee to license non-commercial file sharing represent and reflect the ideology of substantive alternatives to the expansionary intellectual property system?

2) To what degree does defensive publishing represent and reflect the ideology of substantive alternatives to the expansionary intellectual property system?

3) Within theories of the information society how is the term "innovation" used, and to what degree does the usage of the term by various theorists reflect either the ideology of the expansionary IP regime or substantive alternatives to IP?

To answer these questions this study will require a detailed analysis of both the range of incentive structures and outcomes involved in the production and distribution of intellectual goods. In this regard it will be necessary to examine the underlying assumptions and theoretical perspectives behind these incentive structures and outcomes. Furthermore the study will critically engage with the discourse on innovation both with respect to intellectual goods and theories of the information society. To facilitate this discussion, two case studies of lesser studied alternatives to IP will be used to determine the degree to which they reflect the character and ideology of substantive alternatives to the expansionary IP system.

VII. Methodology

A. Structure of the Analysis – An Intensive Research Design

Following the review of literature on defensive publishing and the SAC proposal, the dissertation begins by documenting the expansionary IP regime. The study contains three distinct but connected parts that form a holistic study of intellectual goods and their

relationship to theories of the information society. The first part of the analysis is aimed at examining the theory and discourse surrounding the incentive structures and outcomes that exist in the production and distribution of intellectual goods. The second part critically scrutinizes the idea of innovation and the connection between intellectual goods and innovation. The third part then examines the ideological aspects of innovation including a specific examination of its treatment in theories of the information society. In turn the analysis of incentives, innovation and ideology inform the case studies that are the core of the empirical analysis of the study. The final section of the study concludes by analyzing alternatives to IP, the expansionary IP regime, the Canadian and U.S. outlook and offers recommendations and questions for further study. More detailed information on the subject matter in each of these analyses is contained below in the Organizational Plan.

The study is based on a holistic intensive research design.[145] Morrow and Brown note that intensive research designs tend to focus on a limited number of cases but with a focus towards greater detail, and in turn these analyses avoid the pitfalls of abstracted empiricism and postmodernist relativism.[146] Intensive research designs are comparative in nature, and the particular strength of such a design is that it allows both explications of individual cases as well as limited generalization.[147] The adoption of such a design permits both theorization and causal and interpretive analysis.[148] Though the use of case studies tends to be associated with qualitative research, the study explicitly rejects the qualitative-quantitative dichotomy as a false dichotomy,[149] and adopts an antifoundationalist epistemology that rejects the view that knowledge can be based in a fundamental principle and allows for not only empirical data collection but normative and reflexive reasoning.[150]

B. The Case Study Method

Despite the trend in many social sciences towards variable oriented natural science models, the case study remains a vital method for providing social knowledge.[151] Cases generate not only new empirical insights, but facilitate the development and refinement of theory.[152] They are particularly useful for studying under-researched phenomena.[153]

Given the study's focus on alternatives to IP that have received little scholarly attention, the case study method is particularly well suited.

The selection of cases is a particularly important aspect of the case study method. Cases should be singular entities that are sufficiently both similar and dissimilar to each other to allow meaningful comparison.[154] The use of new cases and case types is particularly important as it allows theoretical innovation.[155] It is important for cases to be different enough to capture the range of variation that exists from the larger group from which they are drawn.[156] While cases are generally compared at the same level of analysis (e.g. comparing one state with another, or one family with another), varying the level of analysis can help to provide insight on connections between specific cases and macro-level phenomena.[157] Though the cases chosen for this study do possess a degree of heterogeneity, these differentiations will be particularly useful for critically examining alternatives to IP. Alternatives to IP are particularly heterogeneous and range from alternative methods of compensating artists and creators (such as the bundling of intellectual goods with physical commodities) to methods of limiting infringement (e.g. TPM) to systems that would entirely replace IP devices (patronage and prizes). Given the broad range of alternatives, it is necessary to examine cases that reflect such diversity.[158] Specific attention has been paid to ensuring that the cases studied include alternatives to both traditional forms of IP (i.e. the use of levies and surcharges on internet access is an alternative to copyright, while the pre-emptive publishing of scientific content is an alternative to patenting such research).

C. The Cases

Two cases will be examined to form the empirical core of the analysis. Defensive publication is the practice of publishing research material in an effort to prevent others from being able to patent a substantively similar invention. Two of the core requirements of patentability are that inventions be novel and nonobvious.[159] To establish what is already known in a field national patent offices conduct searches of technical and academic literature looking for evidence that the claimed invention is not new or would be obvious. In patent law this state of existing knowledge is called "prior art." Once

something has been established as prior art, it is no longer patentable subject matter as it does not meet the criteria of being new or nonobvious. Defensive publication is the practice of publishing research materials to establish prior art. Because a patent provides the legal right to exclude others from the use of the protected subject matter, defensive publishing is used to prevent rivals for patenting a specific invention and being excluded from using that invention as a result. Despite several theoretical models attempting to illustrate how defensive publishing would work in various patent races, there have only been a small number of empirical studies.[160]

The second case study will be an examination of the SAC monthly ISP fee proposal. Initially the SAC proposal was conceived of as an ISP levy in October of 2007 that would have licensed file sharing of music through a levy of residential broadband internet access.[161] This proposal would have required legislative change, and both rights holders and consumers would have been compelled to participate. The proposal was revised in March 2009 to allow both rights holders and internet subscribers to opt out of the levy.[162] In January 2011 the SAC modified its proposal from a levy proposal to a private ordering scheme. This new proposal is still optional for both rights holders and internet subscribers. The current proposal is a "business to business" model where the SAC, rights holders and ISPs partner to license file sharing in exchange for a monthly fee, and as such does not require any legislative change[163] Because the SAC is no longer advocating for a levy proposal, this analysis focuses on the current SAC proposal from January 2011.While there is an extant body of literature on levies, particularly in the European context, the discussion of levies in Canada has centered on the blank media levy, and critical analyses of the SAC proposal, particularly its most recent proposal, are missing.[164]

D. Selection of the Cases

The selection of these specific cases comes from a consideration of several factors beyond the general lack of empirical literature. Each case represents an alternative to a different intellectual property mechanism (patents in the case of defensive publishing and copyright in the case of the SAC proposal). Furthermore, given the dominance of patent

and copyright literature in IP literature it is logical to ensure that a case involving each of these two IP mechanisms is scrutinized. Though the cases do vary in level of analysis (the defensive publishing case examines an alternative to IP, but not focused on any specific form of defensive publishing,[165] while the SAC's proposal is a very specific alternative but part of a broader group of alternatives (including levies)) this will allow for a comparison of how alternatives function in the general versus the specific context. Furthermore, although the SAC proposal would apply only to Canada, because it is a business to business approach, the model could be used elsewhere, and the SAC notes that the Swedish performing and mechanical rights society (STIM) has put forward a similar proposal.[166] Also, the defensive publishing analysis will include explicit analyses of specific venues for defensive publishing, while the analysis of the SAC proposal will include discussion of other means through which ISPs and rights holders partner to enforce IP rights.

These cases are also timely. Though defensive publishing has been practiced for some time, there has been a marked increase in the quantity of defensive publications. According to one calculation the number of defensive publications has doubled in the period from 2000 to 2004 from the 1995 to 1999 period.[167] Specialized forums for defensive publishing (such as the services offered Research Disclosure and IP.com) have emerged to facilitate easier defensive publishing. At the same time more patents are being granted and patent applications being filed.[168] Increased patent activity incentivizes greater defensive publishing. The SAC proposal is part of an ongoing copyright reform process in Canada. SAC officials appeared before parliamentary committees in both 2010 and 2011 to discuss their proposal.[169] Three previous copyright modernization bills in Canada have failed (Bill C-60 in 2005, Bill C-61 in 2008, and Bill C-32 in 2010) and there is currently another bill (Bill C-11) before Parliament that would amend the *Copyright Act*,[170] though the current SAC proposal requires no legislative changes.

Finally both of these alternatives represent substantive changes from the existing IP practices. The SAC proposal would legitimize and license a prodigious volume of infringing activity.[171] While rights holders licensing and monetizing their rights set forth

in the *Copyright Act*, this approach is novel because it originates from the SAC who are not the rights holders. Another crucial element of the SAC proposal is the inclusion of ISPs, who play an essential role in the telecommunication of intellectual goods. Defensive publishing goes even further than creating an alternative revenue scheme; it attacks the patent system from its very foundation by eliminating proprietary rights to inventions while facilitating access to the information behind disclosed knowledge.

Though a number of alternatives to traditional intellectual property devices have become more important due to the expansionary IP regime, defensive publishing and the SAC proposal are particularly important to analyze at this juncture due to their timeliness, importance, and lack of existing scholarship.

E. Source of Data

In examining the cases this study will draw on a range of primary sources. The defensive publishing case will draw empirical evidence from the various venues used to disseminate defensive publications. The websites of IP.com[172] and Research Disclosure[173] provide a wide range of information on defensive publication including white papers on defensive publishing, access to corporate disclosure journals,[174] information about which companies are engaging in defensive publication, and some statistical information on defensive publishing. This material will be complemented with other primary sources of information including Peer to Patent,[175] and information on the Statutory Invention Registration (SIR) system in the United States.[176] These primary sources will be complemented with additional secondary material including the academic literature discussed in the literature review and other relevant policy documents including cases that have dealt with defensive publishing including the United States Court of Appeals for the Federal Circuit decision in *In re Hall*.[177]

The analysis of the SAC ISP proposal will draw heavily on the detailed proposal available on the SAC website.[178] In addition to the proposal details, the SAC website provides answers to a number of common questions on the proposal,[179] quotes from artists and a video interview with singer Randy Bachman.[180] To aid in the analysis of this case this study will also examine the less detailed Writers Guild of Canada ISP

proposal,[181] and the alternative agreements between rights holders and ISPs in other jurisdictions.[182]

F. Micro-Level Analysis and Macro-Level Theorization

While the case study method is extremely useful for providing detailed and nuanced understandings of specific cases, its ability to provide limited generalizations and new theoretical insights is underappreciated. The case study method facilitates what Morrow and Brown describe as "intensive explication."[183] In this regard, such an investigation can explicate the political and economic aspects and relations of a given social system (intellectual goods production and distribution).[184] Combined with the intensive explication is complementary logic of comparative generalization, which produces limited generalizations through the comparison of cases.[185] The combination of intensive explication and comparative generalization case studies can move beyond specific, limited empirical data to provide understanding on broader social phenomenon. This important aspect of case studies is echoed by Sjoberg, Williams, Vaughan and Sjoberg, who note:

> The advantages of case studies (as we perceive them) is that researchers who utilize them can deal with the reality behind appearances, with contradictions and the dialectical nature of social life, as well with a whole that is more than the sum of its parts.[186]

The case study method provides a vital link between theory and evidence, and it must be both simultaneously informed by theory and able to provide new theoretical insights.[187] Hence the design of the study; the cases will draw on the theoretical framework and literature on intellectual goods incentives, innovation and theories of the information society, and in turn can be used to provide greater understanding not only on incentivization, innovation and the ideology of IP and its alternatives.

VIII. Limitations

This study contains some limitations, particularly with respect to scope, although these limitations do not impinge upon the importance of the study and its justification.

The study does not focus exclusively on any single national set of IP/innovation policies, and is not meant as an exhaustive examination of these policies in any one country. Despite this limitation, the nearly global standards set for IP protection in TRIPS and related international IP agreements suggests that this study can provide insights relating to most national IP policies. While no specific country is the sole focus of the study, much of the analysis is focused on the United States and Canada, and notable differences in policy (such as the lack of moral rights protection in the United States in comparison to other countries) will be highlighted. The focus on the U.S. is twofold. Not only is the country the locus of the expansionary IP regime, it is also the jurisdiction where trends identified by information society theorists have tended to be most pronounced. Although both information society trends and expansionary IP policies have occurred in other jurisdictions, these phenomena are most noticeable in the U.S. Canada also feature prominently because it not only serves as a useful comparator to the U.S. (given the relatively close geographic, economic, political, and social conditions), but unlike other advanced nations, Canada has been less supportive of expansionary IP policies.

The study will only examine in detail two alternatives to IP. While a broad range of alternatives exists and some of these will be unanalyzed it is hoped that the framework provided here could be expanded to these alternatives in future studies. The study is also not an exhaustive comparison of patents and copyrights. Though patents and copyrights are both intellectual property mechanisms, there are important distinctions between them as well as differences between patent and copyright statutes and jurisprudence in different countries.[188] Despite this limitation, the study pays particular attention to the differences between patents and copyrights and differences in national treatment and conditions as they relate to the three facets of the analysis (incentive structures, innovatory outcomes and ideological characteristics).

Finally the study will be limited to sources available in English; however, it is posited that an extensive body of literature in English exists to inform the study, and for the study to be completed in a reasonable and timely manner such a limitation is necessary.

IX. Organizational Plan

Following the literature review (Chapter II), the first part (Chapter III) of the analysis will involve an investigation of the prominent dimensions of the expansionary IP regime. It will highlight how traditional IP mechanisms have expanded in scope, term, and severity of penalties for infringement, the rise of *sui generis* IP devices, and the incorporation of IP into the global trade system with a concluding comment on some countervailing trends.

The next part of the analysis (Chapter IV) will focus on incentives. It will begin with an examination of the role of incentives in IP looking at the role of incentives in justificatory theories of intellectual property, the incentives-access tradeoff/paradigm that characterizes intellectual property and the different motives of various types of actors (inventors and creators, rights holding organization, heirs, and researchers). The second part of the chapter will focus on economics and the pecuniary incentive looking first at *homo economicus* and the assumptions behind the pecuniary incentive. It will then examine the discursive shift in economics literature to a sole focus on pecuniary incentives for encouraging intellectual goods production and then examine how this shift has influenced legal thought. This section will conclude with a discussion of the dangers of an exclusive focus on pecuniary incentives. The final section of the chapter will look at other incentives for intellectual activity with a two part discussion focusing first on non-economic incentives for inventive and creative behaviour followed by a discussion on the role of incentives to create versus incentives to disclose information.

Chapter V will examine innovation. The first section of the chapter will examine the innovation models put forward by Arrow and Schumpeter and the empirical literature examining these models. After discussing the economic foundations of innovation the next part of the chapter will discuss the economic importance of innovation with a specific discussion on the role of the rate of innovation. The third section of the chapter will examine the relationship between IP and innovation drawing first on the empirical evidence on IP and innovation before then examining the underappreciated link between creative and artistic activity and innovation, the patent thickets/anticommons problem

and the idea of an information commons.

Building on the preceding analysis in Chapters IV and V, Chapter VI examines the ideological dimensions of innovation. The first section of the ideology chapter will examine the role innovation plays as a societal goal beginning with an examination of some national policies on innovation. The section will then highlight the dangers of the increasingly empty rhetoric on innovation, before finally trying to recast innovation in non-economic terms as part of a broader trend of societal goals from the Enlightenment that have aimed at using science and technology to progress political and social improvement. The second section of the chapter will examine the use of innovation in theories of the information society focusing on the work of Bell, Castells and Harvey.

Chapter VII forms the core of the study and is an empirical analysis of the cases identified: the SAC proposal and defensive publishing. The analysis in the previous three chapters will be used to help critically interrogate these two alternative intellectual goods to determine if they reflect the ideology of the expansionary IP regime or if they represent substantive alternatives from it. Each alternative will be specifically analyzed in terms of the incentives utilized, innovative outcomes and ideological aspects.

Chapter VIII will discuss and analyze the findings of the case studies in the context of the two chapters on innovation and incentives and theoretical framework. By looking at the specific cases and the incentives and outcomes in these cases it will be argued that a broad range of incentives for the creation of intellectual goods exists. More importantly, there is a marked difference in the outcomes of how intellectual goods are produced. While all intellectual goods are potentially innovative, those that prioritize exclusion are well suited for stimulating economic growth, but such growth comes at the price of reduced access and limited social and political advancement. By building on the discussions in chapters III through VI and the empirical analysis in chapter VIII this discussion will not only examine the implications of the expansionary IP regime and some of its alternatives, but also discuss how the ideologies of these systems are advanced in various theories of the information society through use of the term innovation. Finally this section will include a discussion of how the dangers of the

expansionary IP system can be mitigated through the encouragement of substantive alternatives to IP and questions for further research.

X. Conclusion

The proposed study aims to provide greater understanding of the role of incentives and innovation with respect to alternative intellectual goods within the context of an expansionary IP regime and theories of the information society. In furthering this understanding the analysis will focus on two alternative intellectual goods as case studies – defensive publishing and the Songwriters Association of Canada's ISP proposal. This study is particularly timely given the ongoing expansionary trends in IP and concomitant increase in importance of alternatives to IP.

This study's contributions are three fold. First, it provides an empirical analysis of two understudied alternatives to IP. Second, it provides specific evidence-based policy recommendations for policymakers as an outcome. Finally and most importantly, it provides a new faceted framework for analyzing alternatives to IP to determine if alternatives are substantively or only nominally different from IP.

Notes to Chapter One:

[1] United States Trade Representative (USTR), *2009 Special 301 Report*, (2009) 3: http://www.ustr.gov/sites/default/files/Full%20Version%20of%20the%202009%20SPECIAL%20301%20REPORT.pdf ; World Intellectual Property Organization (WIPO), "World Intellectual Property Day 2010 – Innovation Linking the World," (2010): http://www.wipo.int/pressroom/en/articles/2010/article_0010.html ; WIPO Standing Committee on the Law of Patents, *Report on the International Patent System*, SCP/12/3, (2008), 8: http://www.wipo.int/edocs/mdocs/scp/en/scp_12/scp_12_3_rev_2.pdf ; William M. Landes and Richard A. Posner, "An Economic Analysis of Copyright," *Journal of Legal Studies*, 18, (1989), 325; Edmund W. Kitch, "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property," *Vanderbilt Law Review*, 53, (2000), 1727; Kenneth W. Dam, "The Economic Underpinnings of Patent Law," *The Journal of Legal Studies*, 23(1), (Jan. 1994), 248, 247.

[2] Carl Shapiro, "Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting," *Innovation Policy and the Economy*, 1, (2000), 120; Michael Heller, *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives*, (New York: NY, Basic Books, 2008), 78, 105-106; Eric von Hippel, *Democratizing Innovation* (Cambridge, MA: MIT Press, 2005), 12; Yochai Benkler, "Coase's Penguin, or, Linux and *The Nature of the Firm*," *Yale Law Journal*, 112, (2002), 423.

[3] Kenneth J. Arrow, "Economic Welfare and the Allocation of Resources for Invention," in *The Rate and Direction of Incentive Activity: Social and Economic Factors*, (Princeton: Princeton University Press, 1962), 615; WIPO, *Report on the International Patent System*, 8; Landes and Posner, "An Economic Analysis of Copyright Law," 325-6; Stanley M. Besen and Leo J. Raskind, "An Introduction to the Law and Economics of Intellectual Property," *Journal of Economic Perspectives*, 5(1) (Wint. 1991), 5; Stan J.

Liebowitz and Richard Watt, "How to Best Ensure Remuneration for Creators in the Market for Music? Copyright and Its Alternatives," *Journal of Economic Surveys*, 20(4), (2006), 539 n. 12.

[4] Canadian Intellectual Property Office (CIPO), *Moving Forward to Canada's Advantage: Strategic Plan 2007-12*,(n.d.), 6: http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/corp_StrategicPlan-e.pdf/$FILE/corp_StrategicPlan-e.pdf ; European Patent Office (EPO), "The Economic Importance of Patents," 2008: http://www.epo.org/topics/innovation-and-economy/economic-impact.html ; United States -Executive Office of the President - National Economic Council, *A Strategy for American Innovation: Driving Towards Sustainable Growth and Quality Jobs*, (Sept. 2009), 4: http://www.manufacturing.gov/interagency/documents/SEPT_20__Innovation_Whitepaper_FINAL.pdf

[5] Samuel E. Trosow, "The Ownership and Commodification of Legal Knowledge: Using Social Theory of the Information Age as Tool for Policy Analysis," *Manitoba Law Journal*, 30, (2003): 418-419; David Harvey, *A Brief History of Neoliberalism*, (Oxford: Oxford University Press, 2004), 64; James Boyle, "Introduction: A Nondelegation Doctrine for the Digital Age?" *Duke Law Journal*, 50 (Oct. 2000), 16.

[6] In this case "ideology" refers to the systematic scheme or ideas and concepts relating to the political and social that justify action (see, *Oxford English Dictionary*, (Oxford University Press, 2001): http://dictionary.oed.com).

[7] This point does not suggest that proponents of intellectual property do not see any non-economic benefit to innovation; however, the economic benefits of innovation are superordinate to other innovation related outcomes.

[8] Richard Posner goes further suggesting that wealth maximization is not only an economic goal, but an ethical framework that is superior to utilitarian/consequentialist viewpoints (Richard A. Posner, "Utilitarianism, Economics and Legal Theory," *Journal of Legal Studies*, 8, (1979), 119-136).

[9] The ability of intellectual property rights to provide their owners the ability to receive the full social value (full appropriability) of their work is reflected in Kitch's prospect theory of patents (Edmund W. Kitch, "The Nature and Function of the Patent System," *Journal of Law and Economics*, 20(2), (Oct. 1977), 270-1); however, Lemley notes that full appropriability is not endorsed by all proponents of IP (Mark A. Lemley, "Property, Intellectual Property, and Free Riding," *Texas Law Review*, 83, (2005), 1040, n. 33).

[10] In economic terms this cost is referred to as deadweight loss, and is the result of having goods priced above marginal cost.

[11] Hal R. Varian, "Copying and Copyright," *Journal of Economic Perspectives*, 19(2), (2005), 135.

[12] Liebowitz and Watt, "How to Best Ensure Remuneration for Creators in the Market for Music?" 535-36.

[13] The history of prizes to encourage artistic and inventive behaviour is roughly as old as the history of modern intellectual property devices. The British Parliament authorized the Longitude Prize in 1715, only a few years after it enacted its first modern copyright statute (The Statute of Anne) (H. Quill, "John Harrison, Copley Medallist, and the £20 000 Longitude Prize," *Notes and Records of the Royal Society of London*, 18(2), (Dec. 1963), 146). The French have a similarly long historical use of prizes. Nicolas Appert won a prize from the Napoleonic government for his invention of a food canning process, and Louis Daguerre's photographic method was awarded a prize form the Second Republic (Suzanne Scotchmer, *Innovation and Incentives*, (Cambridge, MA: MIT Press, 2004), 43-4). While prizes have not played as strong a role in the U.S., James Madison did propose including the use of prizes in the Constitution; however, his proposal was not adopted (Edward C. Walterscheid, "To Promote the Progress of Science and the Useful Arts: The Background and Origin of the Intellectual Property Clause of the United States Constitution," *Journal of Intellectual Property Law*, 2(1), (Fall 1994), 45-6). With respect to modern prizes there are considerable prizes made available from foundation for advances in spaceflight and genomics (X Prize Foundation, "Overview," (2010): http://www.xprize.org/x-prizes/overview), mathematics (Clay Mathematics Institute, "Millennium Prize Problems," (2010): http://www.claymath.org/millennium/), and even the U.S. Department of Energy is offering a prize for advances in light bulb technology (United States Department of Energy - L Prize, "Transforming the Lighting Landscape," (2010): http://www.lightingprize.org/).

[14] See chap. 2 for a review of the literature on these two alternative types of intellectual goods, and chap. 1, s. VI.C for a detailed discussion of the two cases.

[15] In this regard DRMs and other technological protection measures represent only a nominal alternative to traditional IP devices.

[16] See chap. 1, s. VI - Methodology for a detailed discussion of the cases and proposed analysis.

[17] See chap. 2, highlighting the lack of empirical investigations on defensive publishing and levies on copying related technologies.
[18] An often used counter example is the work of teachers who earn far less than the value they produce. A recent study concluded that skilled kindergarten teachers have a significant impact on the future income of their students (to the degree of $170,000 USD a year), yet they are remunerated at a much lower level (Raj Chetty et. al., "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project Star" *NBER Working Paper No 16381*, (2010), 41).
[19] Over-incentivization of the production of intellectual goods is economically harmful as it diverts resources away from other economically valuables areas of activity and induces rent-seeking (William M. Landes and Richard A. Posner, *The Economic Structure of Intellectual Property Law*, (Cambridge, MA: Belknap Press, 2003), 396; Lemley, "Property, Intellectual Property, and Free Riding," 1032).
[20] Several commentators have suggested that full appropriation raises ethical concerns. Hettinger notes that much of the market value of IP is created through market structures and the previous of work of others, and as such the concept of full appropriability is not suitable (Edward C. Hettinger, "Justifying Intellectual Property," *Philosophy and Public Affairs*, 18(1), (Wint. 1989), 38). Ghosh argues that full appropriability is both economically inefficient and undermine the ethical concept of distributive justice (Shubha Ghosh, "The Fable of the Commons: Exclusivity and the Construction of Intellectual Property Markets," *U.C. Davis Law Review*, 40, (2007), 873).
[21] Barack Obama, as quoted in, United States - National Economic Council, *A Strategy for American Innovation*, (cover page).
[22] As of the date of writing, Bill C-11, *An Act to Amend the Copyright Act*, 1st Sess, 41st Parl, 2011, has passed second reading (Canada – Parliament of Canada, "House Government Bill 41st Parliament, 1st Session: C-11," *LEGISinfo*, (n.d.): http://www.parl.gc.ca/LegisInfo/BillDetails.aspx?Mode=1&Language=E&billId=5134851&View=0).
[23] *Canada (Attorney General) v. Amazon.com, Inc*., 2011 FCA 238.
[24] *Amazon.com, Inc. v. Canada (Attorney General),* [2010] 4 FCR 541, 2010 FC 1011.
[25] See chap. 1, s. VII.C for a detailed discussion of the two cases.
[26] See chap. 1, s. VII.D for a detailed discussion of case selection.
[27] See chap. 1, s. V.G for a discussion of the work of these theorists and the justification for choosing to use their work.
[28] Sandra Braman, *Change of State: Information, Policy, and Power*, (Cambridge, MA: MIT Press, 2006), 71-74.
[29] Douglas Kellner, *Critical Theory, Marxism and Modernity*, (Cambridge: Polity, 1989), 7; Douglas Kellner, "Critical Theory and the Crisis of Social Theory," *Sociological Perspectives*, 33(1), (Spring 1990), 12; and Raymond A. Morrow and David D. Brown, *Critical Theory and Methodology*, (Thousand Oaks, CA: Sage, 1994), 275.
[30] Kellner, "Critical Theory and the Crisis of Social Theory," 24; and, Morrow and Brown, *Critical Theory and Methodology*, 275.
[31] Kellner, "Critical Theory and the Crisis of Social Theory," 12.
[32] Kellner, "Critical Theory and the Crisis of Social Theory," 20.
[33] Kellner, *Critical Theory, Marxism and Modernity*, 159.
[34] Kellner, *Critical Theory, Marxism and Modernity*, 161.
[35] Morrow and Brown, *Critical Theory and Methodology*, 11.
[36] Samuel E. Trosow, "Information for Society: Towards a Critical Theory of Intellectual Property Policy," (PhD diss., UCLA, 2002), 201.
[37] Richard A. Posner, *Economic Analysis of Law*, 7th Ed. (New York: Wolters Kluwer, 2007); Posner, "Utilitarianism, Economics and Legal Theory,"; Richard A. Posner, "Intellectual Property: The Law and Economics Approach," *Journal of Economic Perspectives*, 19(2), (Spring 2005); Richard A. Posner, *The Economics of Justice*, (Cambridge MA: Harvard University Press, 1991); and Richard A. Posner, "Rational Choice, Behavioral Economics, and the Law," *Stanford Law Review*, 50, (1998).
[38] William M. Landes and Richard A. Posner, "The Economics of Trademark Law," *The Trademark Reporter*, 78, (1988), Landes and Posner, "An Economic Analysis of Copyright Law,"; and Landes and Posner, *The Economic Structure of Intellectual Property Law*.
[39] Kitch, "The Nature and Function of the Patent System,"; and Kitch "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property."

[40] For Posner, he specifically notes that his conception of economically efficient is "wealth maximizing" Posner, *Economic Analysis of Law*, 13.
[41] Posner, *Economic Analysis of Law*, 6-13.
[42] Christopher May, *A Global Political Economy of Intellectual Property Rights: The New Enclosures*, (London: Routledge, 2000); and Christopher May, *The Information Society: A Skeptical View*, (Cambridge: Polity, 2002).
[43] Peter Drahos, *A Philosophy of Intellectual Property*, (Aldreshot: Dartmouth Publishing, 1996); and Peter Drahos and John Braithwaite, *Information Feudalism: Who Owns the Knowledge Economy*, (London: Earthscan, 2002).
[44] Samuel E. Trosow, "The Illusive Search for Justificatory Theories: Copyright, Commodification and Capital," *The Canadian Journal of Law and Jurisprudence*, 16(2), (July 2003); Trosow, "Information for Society,"; Trosow, "The Ownership and Commodification of Legal Information."
[45] May, A Global Political Economy of Intellectual Property Rights, 162-181.
[46] Drahos and Braithwaite, *Information Feudalism*, 85-149.
[47] Trosow, "Information for Society," 283; and, Samuel E. Trosow, "The Illusive Search for Justificatory Theories: Copyright, Commodification and Capital," .
[48] Trosow, "Information for Society," 278.
[49] Trosow, "Information for Society," 283; and, Trosow, "The Illusive Search for Justificatory Theories," 239.
[50] See chap 4, s. I.
[51] See chap. 4, s. II.B.
[52] See chap 4, s. II.A.
[53] See chap. 5, s. III.A.
[54] See chap 5, s. III.C.
[55] See chap 5 s. III.D.
[56] Morrow and Brown, *Critical Theory and Methodology*, 250.
[57] Kellner, "Critical Theory and the Crisis of Social Theory," 12; and, Morrow and Brown, *Critical Theory and Methodology*, 23.
[58] Morrow and Brown, *Critical Theory and Methodology*, 50-51.
[59] See chap 8, s. V.
[60] An illustrative example of a utilitarian approach to IP is found in the U.S. Constitution, Article I, section 8, clause 8, which states Congress is empowered, "To promote the progress of science and useful arts, by securing for a limited time to authors and inventors the exclusive right to their respective writings and discoveries" (U.S. Constitution, Article I, section 8, clause 8). Lockean justifications of IP are based on the chapter on property in Locke's Second Treaties of Government (John Locke, *Two Treaties of Government*, Rev. Ed., (New York, NY: New American Library, 1963), 327-344). For a discussion of the role of incentives to intellectual property see: Arrow, "Economic Welfare and the Allocation of Resources for Invention," 619-623; Joseph A. Schumpeter, *Capitalism, Socialism and Democracy*, 3rd ed., (New York: Harper Perennial, 2008), 81-86; Joseph A. Schumpeter, *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*, Redvers Opie (trans.), (Cambridge, MA: Harvard University Press, 1934), 65-75; Fritz Machlup and Edith Penrose, "The Patent Controversy of the 19th Century," *The Journal of Economic History*, 10(1), (May 1950), 21-25; Glynn S. Lunney, "Reexamining Copyrights Incentives-Access Paradigm," *Vanderbilt Law Review*, 49, (Apr. 1996), 492-499; Landes and Posner, *The Economic Structure of Intellectual Property Law*, 9-13; Hettinger, "Justifying Intellectual Property," 40-43; Kitch, "The Nature and the Function of the Patent System," 265-270; Trosow, "The Illusive Search for Justificatory Theories," 237-240,
[61] *U.S. Constitution*, Article I, section 8, clause 8.
[62] CIPO, "About Intellectual Property: The Role of IP," (2009): http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr00332.html
[63] The history of civilizations that lacked modern, western intellectual property devices including of Ancient Egypt, Greece and Rome, China and India provide clear indication of this point. A intrinsic motivation towards creativity and inventiveness can also be gleaned a child's natural proclivity to draw when given crayons or makers or build when given blocks.
[64] Steven Shavell and Tanguy Van Ypesele, "Rewards versus Intellectual Property Rights," *Journal of Law and Economics*, 44, (2001), 5; Kitch, "The Nature and Function of the Patent System," 266; Landes and

Posner, "The Economics of Trademark Law," 267-8; Landes and Posner, "An Economic Analysis of Copyright Law*,"* 325-6; Michael McAleer and Les Oxley, "Intellectual Property and Economic Incentives," *Journal of Economic Surveys*, 20(4), (2006), 484; Kenneth Carlaw, Les Oxley, Paul Walker, David Thorns, and Michael Nuth, "Beyond the Hype: Intellectual Property and the Knowledge Society/Knowledge Economy," *Journal of Economic Surveys*, 20(4), (2006), 641; and, Dam, "The Economic Underpinnings of Patent Law," 248, 263.

[65] This point is developed from the argument that is possible to create a non-falsifiable definition of self-interest subsumes all actions including altruistic ones as self-interested. Because this 'weak' definition of self-interest categorizes all behaviours as self-interested it provides little analytical insight as every possible action is seen by definition to be motivated by self-interest. See, Russell B. Korobkin and Thomas S. Ulen, "Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics," *California Law Review*, 88(4), (July 2000), 1061; and, Posner, "Rational Choice, Behavioral Economics, and the Law," 1557.

[66] Leibowitz and Watt note, "The more modern view of the rationale for copyright is firmly based upon the monetary motives behind creation," arguing that while the early literature on copyright included discussions of a wide range of motives for the production of IP, it has come to take on an entirely and exclusively economic focus (Liebowitz and Watt, "How to Best Ensure Remuneration for Creators in the Market for Music?" 539 n. 12), and see chap. 4, s. II.B.

[67] Wendy J. Gordon, "Render Copyright unto Caesar: On Taking Incentives Seriously," *University of Chicago Law Review*, 71, (2004), 88.

[68] "Moral Rights" with respect to copyright is a specific set of rights given to the authors that are non-economic in nature and deal with ensuring the artistic integrity of the work and the authors reputation. Though the Berne Convention (Article 6*bis*) provides for the protection of authors moral rights, the United States does not recognize moral rights, and specifically excluded them from TRIPS.

[69] For a more detailed discussion of the role of TRIPS in the expansionary intellectual property regime, see chap. 3, s. II.C.

[70] Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), 15 Apr., 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 *United Nations Treaty Series* (UNTS) 99, art. 9, cl. 1.

[71] Harold Demsetz, "Information and Efficiency," *Journal of Law and Economics*, 12, (1969), 13.

[72] Tom G. Palmer, "Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects," *Harvard Journal of Law and Public Policy*, 13, (1990), 864-5.

[73] Kitch, "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property," 1729-1730.

[74] Ajit Pyati, "A Critical Theory of Open Access: Libraries and Electronic Publishing," *First Monday*, 12(10), (Oct. 2007), http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1970/1845

[75] Jonathan Zittrain, "Normative Principles for Evaluating Free and Propriety Software," *University of Chicago Law Review*, 71, (2004), 271-2.

[76] Michael Abramowicz, "Perfecting Patent Prizes," *Vanderbilt Law Review*, 56, (2003), 126.

[77] Zittrain, "Normative Principles for Evaluating Free and Proprietary Software," 278.

[78] See among others: Yochai Benkler, "The Political Economy of the Commons," *Upgrade*, 4(3), (2003),6-9; May, *A Global Political Economy of Intellectual Property Rights: The New Enclosures*, 13; Lawrence Lessig, *The Future of Ideas*, (New York: Random House, 2001), 85; Drahos, *A Philosophy of Intellectual Property*, 55-57; Vandana Shiva, *Protect or Plunder*, (London, Zed Books: 2002), 43-5; Lester C. Thurow, "Needed: A New System of Intellectual Property Rights," *Harvard Business Review*, Sept.-Oct. 1997, 101; Charlotte Hess and Elinor Ostrom, "Introduction: An Overview of the Knowledge Commons," in *Understanding Knowledge as a Commons: From Theory to Practice*, Charlotte Hess and Elinor Ostrom, Eds., (Cambridge, MA: MIT Press, 2007), 3-26; David Boiller, "The Growth of the Commons Paradigm," in *Understanding Knowledge as a Commons: From Theory to Practice*, Charlotte Hess and Elinor Ostrom, (eds.), (Cambridge, MA: MIT Press, 2007), 27-40; Nick Dyer-Witheford, *Cyber-Marx: Cycles and Circuits of Struggle in High-Technology Capitalism*, (Urbana, IL: University of Illinois Press, 1999), 201-9; James Boyle, "The Second Enclosure Movmement and the Construction of the Public Domain," *Law and Contemporary Problems*, 66, (Wint./Spring 2003), 33-74.

[79] Shapiro, "Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting," 120; Heller, *The Gridlock Economy*, 26; James M. Buchanan and Yong J. Yoon, "Symmetric Tragedies: Commons and Anticommons," *Journal of Law and Economics*, 43, (2000), 11-12.

[80] Drahos, *A Philosophy of Intellectual Property*, 56.
[81] Hess and Ostrom, "Introduction: An Overview of the Knowledge Commons," 4.
[82] Boiller, "The Growth of the Commons Paradigm," 34.
[83] Shubba Ghosh, "How to Build a Commons: Is Intellectual Property Constricting, Facilitating or Irrelevant," *Understanding Knowledge as a Commons: From Theory to Practice*, Charlotte Hess and Elinor Ostrom, Eds., (Cambridge, MA: MIT Press, 2007), 210.
[84] GNU Operating System, 'The GNU Operating System," (2011), http://www.gnu.org/
[85] Creative Commons, "About Licenses," n.d., http://creativecommons.org/about/licenses/
[86] John Willinsky, *The Access Principle: The Case for Open Access to Research and Scholarship*, (Cambridge, MA: MIT Press, 2006), 212-6.
[87] Posner argues that the purpose of any legal incentive structure is to produce wealth-maximizing behaviour (Posner, *The Economics of Justice*, 75; Heald contends that American patent law has always attempted to maximize wealth (Paul Heald, "Federal Intellectual Property Law and the Economics of Preemption," *Iowa Law Review*, 76, (1991), 964-5)).
[88] McAleer and Oxley, "Intellectual Property and Economic Incentives*,"* 488; Richard Gilbert, "Looking for Mr. Schumpeter: Where are We in the Competition-Innovation Debate?" *Innovation Policy and the Economy*, 6, (2006), 159. See also Merges discussion of how the U.S. Court of Appeals for the Federal Circuit, which handles all appeals on patent infringement cases, has adopted a limited view of innovation as commercial success with reference to the patent requirement for nonobviousness (Robert P. Merges, "Commercial Success and Patent Standards: Economic Perspectives on Innovation," *California Law Review*, 76, (1988), 837-8).
[89] Erik Brynjolfsson and Xiaoquan (Michael) Zhang, "Innovation Incentives for Information Goods," *Innovation Policy and the Economy*, 7, (2006), 99; Paul Romer, "When Should We Use Intellectual Property Rights," *American Economic Review*, 92(2), (2002), 215; Erik Brynjolfsson and Adam Saunders, *Wired for Innovation: How Technology is Reshaping the Economy*, (Cambridge, MA: MIT Press, 2010), 110-112.
[90] Michael Carrier, *Innovation for the 21st Century: Harnessing the Power of Intellectual Property and Antitrust Law*, (New York: NY, Oxford University Press, 2009), 2-3.
[91] Bridget Kendall, "The New World Order," *BBC News*, 15 Aug., 2001: http://news.bbc.co.uk/2/hi/europe/1480801.stm
[92] Boiller, "The Growth of the Commons Paradigm," 37.
[93] In addition to 'information society' Carlaw et. al identify 14 other terms used by various authors to describe the new change from industrial society (Carlaw et. al., "Beyond the Hype: Intellectual Property and the Knowledge Society/Knowledge Economy," 669-690).
[94] Trosow, "The Ownership and Commodification of Legal Knowledge," 420-421.
[95] For a discussion of the numerous approaches to information society theories see: Frank Webster, *Theories of the Information Society*, 3d Ed., (London: Routledge, 2006), 8-31; May, *The Information Society: A Skeptical View*, 1-12; and Carlaw et. al., "Beyond the Hype," 669-690.
[96] May, *The Information Society*, 12-16.
[97] Webster, *Theories of the Information Society*, 8-21.
[98] May, *The Information Society*, 149-150; and, Webster, *Theories of the Information Society*, 6-7, and 270-273.
[99] Trosow, "The Ownership and Commodification of Legal Knowledge," 440; and, Webster, *Theories of the Information Society*, 12.
[100] Webster, *Theories of the Information Society*, 10;
[101] European Commission, "Information Society," (2010): http://ec.europa.eu/information_society/index_en.htm
[102] United States - America.gov, "U.S. Delegation Cites Consensus on Key Information Society Issues," America.gov (10 Dec., 2003): http://www.america.gov/st/washfile-english/2003/December/20031210163112rellufj0.6401483.html
[103] Industry Canada, "European Union – Canada Joint Statement: Electronic Commerce in the Global Information Society," (2008): http://www.ic.gc.ca/eic/site/ecic-ceac.nsf/eng/gv00386.html ; Industry Canada, "Canada – United Kingdom Joint Statement on Global Electronic Commerce and E-Government," (2008): http://www.ic.gc.ca/eic/site/ecic-ceac.nsf/eng/gv00387.html ; Industry Canada, "Canada – Costa Rica Joint Statement on Global Electronic Commerce," (2008): http://www.ic.gc.ca/eic/site/ecic-

ceac.nsf/eng/gv00382.html ; and, Industry Canada, "Convergence Policy – Backgrounder," (2009): http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf05267.html

[104] Ajit Pyati, "WSIS: Whose Vision of an Information Society?" *First Monday*, 10(5), (May 2005): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1241/1161

[105] Manuel Castells, *The Information Age: Volume 1 - The Rise of the Network Society*, 2nd ed., (Oxford: Blackwell, 2000), 14.

[106] Castells, *The Rise of the Network Society*, 13.

[107] Castells, *The Rise of the Network Society*, 17.

[108] Castells, *The Rise of the Network Society*, 17.

[109] Manuel Castells, *The Information Age: Volume II - The Power of Identity*, (Oxford: Blackwell, 1997), 173.

[110] Castells, *The Rise of the Network Society*, 166.

[111] Castells, *The Rise of the Network Society*, 164.

[112] Castells, *The Rise of the Network Society*, 302.

[113] Castells, *The Power of Identity*, 302.

[114] Castells, *The Power of Identity*, 243.

[115] Castells, *The Power of Identity*, 110-33.

[116] Manuel Castells, *The Information Age: Volume III - End of Millennium*, 2nd ed., (Oxford: Blackwell, 2000), 338-365.

[117] Castells, *The Power of Identity*, 68-9, 106.

[118] Webster, *Theories of the Information Society*, 115, 120.

[119] Webster, *Theories of the Information Society*, 120.

[120] Giddens specifically emphasizes the heightened surveillance mechanisms developed by the nation state and capitalism (Anthony Giddens, "Living in a Post-Traditional Society," in *Reflexive Modernization: Politics, Tradition, and Aesthetics in the Modern Social Order*, (Stanford: Stanford University Press, 1994), 92).

[121] Castells, *The Rise of the Network Society*, 215.

[122] Schumpeter, *Capitalism, Socialism and Democracy*, 84.

[123] Manuel Castells, *The Internet Galaxy: Reflections on the Internet, Business, and Society*, (Oxford: Oxford University Press, 2001), 100.

[124] Castells, *The Rise of the Network Society*, 120.

[125] Castells, *The Internet Galaxy*, 182.

[126] Castells, *The Internet Galaxy*, 103.

[127] David Harvey, *The Condition of Post Modernity*, (Cambridge, MA: Blackwell, 1990), 147.

[128] Harvey, *The Condition of Post Modernity*, 142.

[129] Harvey, *The Condition of Post Modernity*, 154.

[130] Webster, *Theories of the Information Society*, 265.

[131] Harvey, *The Condition of Post Modernity*, 116.

[132] Harvey, *The Condition of Post Modernity*, 158-9.

[133] Harvey, *The Condition of Post Modernity*, 171, 285.

[134] Harvey, *The Condition of Post Modernity*, 284-307.

[135] Harvey, *The Condition of Post Modernity*, 154.

[136] Harvey, *The Condition of Post Modernity*, 164-5.

[137] Harvey, *A Brief History of Neoliberalism*, 64.

[138] Harvey, *The Condition of Post Modernity*, 105.

[139] Harvey, *A Brief History of Neoliberalism*, 68.

[140] Harvey, *A Brief History of Neoliberalism*, 69.

[141] Harvey, *A Brief History of Neoliberalism*, 69; this quote echoes an earlier sentiment from Harvey on innovation, that it "exacerbates instability, insecurity, and in the end, becomes the prime force pushing capitalism into the periodic paroxysms of crisis" (Harvey, *The Condition of Post Modernity*, 106).

[142] Harvey, *A Brief History of Neoliberalism*, 64.

[143] Harvey, *A Brief History of Neoliberalism*, 68, and 160.

[144] Daniel Bell, *The Coming of Postindustrial Society: A Venture in Social Forecasting*, spec. anniv. ed., (New York: Basic Books, 1999), ix-lxxxcv.

[145] Morrow and Brown, *Critical Theory and Methodology*, 250.

[146] Morrow and Brown, *Critical Theory and Methodology*, 250.
[147] Morrow and Brown, *Critical Theory and Methodology*, 250.
[148] Charles C. Ragin, *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*, (Berkeley, CA: University of California Press, 1987), 51.
[149] Morrow and Brown, *Critical Theory and Methodology*, 207.
[150] Morrow and Brown, *Critical Theory and Methodology*, 222.
[151] Gideon Sjoberg, Norma Williams, Ted R. Vaughan, and Andree F. Sjoberg, "The Case Study Approach in Social Research," *A Case for the Case Study*, Joe R. Feagin, Anthony M. Orum and Gideon Sjoberg, Eds., (Chapel Hill, NC: University of North Carolina Press, 1991), 27, 44; and Charles C. Ragin, "Introduction: The Problem of Balancing Discourse on Cases and Variables in Comparative Social Science," *Issues and Alternatives in Comparative Social Research*, Charles C. Ragin Ed., (Leiden: E.J. Brill, 1991), 3.
[152] John Walton, "Making the Theoretical Case," *What Is a Case? Exploring the Foundations of Social Inquiry*, Charles C. Ragin and Howard S. Becker, Eds., (New York, NY: Cambridge University Press, 1992), 127.
[153] York Bradshaw and Michael Wallace, "Informing Generality and Explaining Uniqueness: The Place of Case Studies in Comparative Research," in *Issues and Alternatives in Comparative Social Research*, Charles C. Ragin Ed., (Leiden: E.J. Brill, 1991), 164.
[154] Ragin, "Introduction," 1.
[155] Diane Vaughan, "Theory Elaboration: The Heuristics of Case Analysis," *What Is a Case? Exploring the Foundations of Social Inquiry*, Charles C. Ragin and Howard S. Becker, Eds., (New York, NY: Cambridge University Press, 1992), 174.
[156] Larry J. Griffin, Christopher Botsko, Ana-Maria Wahl, and Larry W. Issac, "Theoretical Generality, Case Particularity: Qualitative Comparative Analysis of Trade Union Growth and Decline," Research," in *Issues and Alternatives in Comparative Social Research*, Charles C. Ragin Ed., (Leiden: E.J. Brill, 1991), 111.
[157] Vaughan, "Theory Elaboration," 184.
[158] Liebowitz and Watt, "How to Best Ensure Remuneration for Creators in the Market for Music?" 535-36.
[159] In Canada see the *Patent Act* (R.S., 1985, c. P-4) sections 28.2 and 28.3, and in the United States see the *Patent Act* (35 U.S.C. § 102 and 103).
[160] See chap. 2, for a review of the literature on defensive publication and a discussion of the existing empirical studies.
[161] SAC, "Our Proposal: Detailed," (2011): http://www.songwriters.ca/proposaldetailed.aspx
[162] Michael Geist, "Songwriters rewrite bid for legalized file sharing," *Toronto Star*, (23 Mar. 2009): http://www.thestar.com/article/606488
[163] SAC, "Our Proposal: Detailed."
[164] See chap. 2, for a review of the literature on levies and the Songwriters Association of Canada ISP levy proposal.
[165] See chap. 1, s. VII.D for a discussion of the specific venues of defensive publishing that will be included in the analysis.
[166] SAC, "Proposal FAQ," (n.d.): http://songwriters.ca/proposalfaq.aspx
[167] Justin P. Johnson, "Defensive Publishing by a Leading Firm," (2004), 19: http://ssrn.com/abstract=606781
[168] In 2000 there were 295,926 U.S. utility patent applications of which 157,494 were granted; by 2009 these numbers had increased to 456,106 and 167,349 respectively (USPTO, "U.S. Patent Activity: Calendar Years 1790 to Present," (2011): http://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm
[169] Canada - House of Commons – Standing Committee on Canadian Heritage, "Evidence: Thursday, October 28, 2010," 40th Parl., 3rd sess., (2010): http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4740661&Language=E&Mode=1&Parl=40&Ses=3 ; and, Canada – House of Commons – Legislative Committee on Bill C-32, "Evidence: Tuesday, March 1, 2011," 40th Parl. 3rd sess., (2011): http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4998663&Mode=1&Parl=40&Ses=3&Language=E
[170] Bill C-11, *An Act to Amend the Copyright Act*, 1st Sess, 41st Parl, 2011.

[171] The existing blank audio media levy allows for non-commercial private copying, but this does not include the right to share music through file sharing applications as the uploading of music would constitute a communication of the work to the public by telecommunication, a right of copyright which is not licensed by the existing levy (*Copyright Act*, s. 3(f), and 80(2)(c)).
[172] IP.com, "IP.com," (2011): http://www.ip.com
[173] Research Disclosure, "Research Disclosure," (2011): http://www.researchdisclosure.com/
[174] Corporate disclosure journals such as the *Xerox Disclosure Journal* and *IBM Technical Disclosure Bulletin* were used by large firms before the internet as means to disclose research findings.
[175] While Peer to Patent is technically not a forum for defensive publication, it does serve a similar function as a prior art database and is particularly relevant given that it is a joint venture of the New York Law School and the United States Patent and Trademark Office (USPTO). It contains several useful sources on prior art invalidation/defensive publishing (Peer to Patent, "Welcome to Peer to Patent," (2010): http://peertopatent.com/).
[176] USPTO, *Manual of Patent Examining Procedure*, 8th ed. (2010), 1100-7 (s. 1111): http://www.uspto.gov/web/offices/pac/mpep/index.htm
[177] *In re Hall*, 781 F. 2d. 897 (Fed. Cir. 1986).
[178] SAC, "Our Proposal."
[179] SAC, "Proposal FAQ."
[180] SAC, "Songwriters' Perspectives," (n.d.): http://www.songwriters.ca/songwritersperspectives.aspx
[181] Writers Guild of Canada, "Writers Guild of Canada Presents New Ideas for More Canadian Stories Online," (Feb. 24, 2009): http://www.wgc.ca/images2/New%20Media%20Press%20Release%2002%2024%2009.pdf
[182] Center for Copyright Information, "Music, Movie, TV and Broadband Leaders Team to Curb Online Content Theft: Announce Common Framework for 'Copyright Alerts,'" (7 Jul. 2011): http://www.copyrightinformation.org/node/704
[183] Morrow and Brown, *Critical Theory and Methodology*, 211.
[184] Morrow and Brown, *Critical Theory and Methodology*, 212.
[185] Morrow and Brown, *Critical Theory and Methodology*, 212.
[186] Sjoberg, et. al., "The Case Study Approach in Social Research," 39.
[187] Charles C. Ragin, "'Casing' and the Process of Social Inquiry," *What Is a Case? Exploring the Foundations of Social Inquiry*, Charles C. Ragin and Howard S. Becker, (eds)., (New York, NY: Cambridge University Press, 1992), 225.
[188] For a discussion of the differences between copyright ant patents see David Vaver, *Intellectual Property Law: Copyrights, Patents and Trade-marks*, 2nd ed., (Toronto: Irwin Law, 2011).

Chapter Two – Review of Relevant Literature

This chapter reviews the existing academic literature on the two case studies.[1] The first section provides an examination of the literature on defensive publishing and the second section examines the extant literature on the use of levies or surcharges on copying related technologies and the SAC's proposal.

I. Defensive Publishing

Though defensive publishing continues to attract increasing scholarly attention, much of the academic analyses of the subject focus on its theoretical usage or on more practical measures such as how to ensure a defensive publication will be counted as prior art. There is a noticeable dearth of empirical studies on the subject.

Though defensive publishing has been practiced for over 50 years[2] it is only in the past ten years that the topic has attracted scholarly attention. A number of scholars have attempted to model how defensive publishing would be used in a patent race. In 2000, Parchomovsky analyzed the use of defensive publishing using a game theory model of a patent race.[3] He speculated that there were three motives for defensive publishing: it is used by laggards in a patent race because they believe rivals are further ahead in the patent race, it may be used because firms believe that rivals may secure financing more easily and therefore patent soon, at it may result from a firm choosing to exit a particular patent race but seeking to spoil that ability of others to obtain a patent.[4] He determined that defensive publishing lowers the expected value of a patent and suggested that it may be used by firms trailing in a patent race but not by those leading.[5] Using the same game theory modeling approach, Litchman Baker and Kraus argued that Parchomovsky's conclusions were flawed. Their model suggests that defensive publishing tactic is not attractive to patent race laggards, but may be may be an option for patent race leaders who seek to drive out competitors and signal their superior research in a particular area.[6] They also suggested that bargaining between rivals would limit the attractiveness of disclosure by firms in patent race, and that the legal rules surrounding prior art make effective defensive publishing more difficult.[7] Examining situations involving

cumulative innovation, Bar-Gill and Parchomovsky suggest that defensive publication by a firm signals to others that the firm is not attempting to appropriate all from subsequent follow-on inventions. In doing so such a signal should spur cumulative innovation.[8] They conclude by recommending the provision in US patent law that allows inventors to file a patent application up to one year prior to the date of application (35 U.S.C. § 102(b)) be removed.[9] In a similar vein to Parchomovsky and Litchman as well as Baker and Kraus, Bar uses an economic model of a patent race to analyze the role of defensive publishing; however, her model is novel in that it treats prior art as endogenous.[10] She concludes that laggards have an incentive to use defensive publication to prolong patent races.[11] A similar conclusion is reached by Baker and Mezzetti on the basis of their modeling of a patent race.[12] Ponce has also used economic modeling to determine the impact of defensive publishing, but unlike others his model considers the relationship between secrecy and publication.[13] Based on the model he concludes that defensive publishing should induce the use of secrecy by other firms.[14] Finally, Gill also models the use of disclosure in a patent race, concluding that defensive publishing is used by leading firms to signal their commitments to a research area with the caveat that it will not be used for technologies with low development costs.[15] While the various economic models demonstrate the potential uses of defensive publishing, they also clearly evince the case for greater empirical research.

Several authors have commented on various dimensions of defensive publishing without using economic models. Eisenberg has suggested that defensive publishing may not result in increasing the known prior art and may in fact make patenting easier for rivals.[16] She also suggests that filing a patent application (which can later be abandoned or converted into a Statutory Invention Registration (SIR) under US patent law) is a superior strategic maneuver to defensive publishing.[17] Merges notes that defensive publishing should be seen as part of a broader phenomenon of increasing dynamism in the public domain, and suggests that defensive publishing is a facet of a variety of "property preempting investments."[18] Heller notes that defensive publishing and other property pre-empting investments can be used to overcome anticommons problems.[19] Colson, who is the President and CEO of the defensive publishing venue IP.com, has written articles on how defensive publication should be considered as part of a comprehensive innovation and

intellectual property strategy.[20] He advocates using defensive publishing for non-core technologies suggesting it does not have to be solely defensive in nature as it can also serve as a misinformation tactic when used strategically.[21] He advocates that defensive publications not be placed in academic journals (because of the lack of control over the publication time) or websites (due to legal difficulties in establishing the date of publication).[22] Using a similar approach Barrett highlights the role defensive publishing can play in biotechnology. He also emphasizes the weakness of academic journals and websites, while also suggesting that defensive publications be sufficiently detailed so as to constitute prior art.[23]Adams and Henson-Apollonio have written that defensive publishing can play a role in agricultural research, and similar to Barrett and Colson give guidance on how best to defensively publish.[24] They also suggest that defensive publishing is important to maintaining the public good nature of innovation.[25] Boettiger posits that broadly written defensive publications are most useful for defeating patents, while stating that early disclosure supports collaborative innovation.[26]

Despite the numerous commentaries on how best to pursue defensive publishing and the numerous economic models, empirical investigations are severely lacking. To support the prediction that laggards use disclosure to extend patent races, Baker and Mezzetti examined IBM patent applications that cited the *IBM Technical Disclosure Bulletin* focusing on the difference in time between the date of publication of the cited material and the patent application. Based on the observation that in 54% of the cases the difference between citation publication and the patent application was less than five years they concluded that firms defensively publish when engaged in patent races.[27] Johnson's study of the disclosure venues Research Disclosure and IP.com revealed that IBM, Motorola and Siemens accounted for 78% of the disclosures before 2000.[28] He also found that from 1990-2004 35% of disclosures dealt with software or business methods related subject matter.[29] Henkel and Jell examined patent filings with the German Patent and Trademark Office (GPTO) to look for evidence of defensive publishing. Specifically they looked for patents applications that fit a specific pattern – those filed with GPTO with no foreign or internal priority (direct filings) that the applicant neither requested for examination nor put forward subsequent filings, arguing that the logical explanation for such a filing would be as a cost effective and authoritative way of establishing prior art.[30]

They concluded 5% of direct filings fit this pattern, and suggested that such publications had to be motivated by a desire to defensively publish.[31] A 2008 study by Henkel and Pangerl surveyed 44 company patent professionals, nine officials at the European Patent Office (EPO), two patent lawyers and the CEO of a firm offering defensive publishing services.[32] Their interviews revealed that large firms had a greater propensity for defensive publishing, firms used patent applications as a mechanism for defensive publishing, there was no reported use of defensive publishing as a strategy by laggards involved in patent races, and that the most important motive for disclosure was the ability to continue to use the technology and not be encumbered by the proprietary rights of others.[33] These findings are particularly insightful given that they not only looked at motivations for patenting, but also suggest that many of the theoretical models created by others lack empirical support. Though limited in number the few empirical studies of defensive publishing have been very informative and particularly useful in addressing the suitability of the economic models developed; however, there still remains shortcomings in the literature on defensive publishing. Considerably more room exists for further empirical investigations.

Though authors have examined various facets of defensive publishing such as how to maximize its effectiveness or its use in patent races, the extant empirical literature is clearly lacking. There is a clear need of further empirical research as a means to assess the various models and expand understanding of the role defensive publishing plays as an alternative to traditional patenting.

II. The Songwriters Association of Canada's Internet Service Provider (ISP) Monthly Fee Proposal

Literature on levies or surcharges on copying related technologies is concentrated in three groups: articles examining the European use of levies, proposals by scholars for levies including ISP levies, and criticism of such proposals. To date the SAC's proposal has received only passing scholarly attention and it has escaped critical scrutiny.

Much of the literature on levies is concentrated on their use by European nations.[34] Helberger and Hugenboltz note that the European landscape is considerably varied with

some countries having no exceptions for private copying (Ireland and the United Kingdom), while other countries such as Belgium and Portugal forbidding private contracts and licensing agreements from restricting private copying rights.[35] Ulmer-Eilfort compares the levy systems in 18 EU countries and concludes the German system is by far the broadest and also produces the most revenues.[36] His analysis reveals that despite the wide use of levies in Europe, levies on internet access have not been used.[37] Mezei proposes that the United Kingdom adopt a levy system similar to the one found in continental Europe suggesting that it would lead to less confrontation between rights holders and users.[38] Christie compares the use of levies in common law and civil law countries and finds that levies are more common in civil law countries which tend to place a higher emphasis on author's moral rights.[39] He concludes that the Canadian introduction of a levy system, along with many of those used in Europe, represent a tendency of nations towards a middle ground where private copying is permitted but artists are remunerated for such an exception.[40]

Several authors have put forward their own levy proposals. Lunney compares the use of levies with a regime that would use strong encryption technology to protect digital content concluding that a levy based system would be superior.[41] He posits that the extensive use of technological protection measures (TPMs) would allow rights holding groups to distort prices to a greater degree than the market distortions caused by a levy.[42] Lunney also believes that a levy would help incentivize the production of a broader range of works.[43] Ku discusses the use of a levy on computer, audio and video equipment and internet service.[44] He claims that a 2 percent levy placed on the sales at electronics and software stores could generate $1.3 billion (USD) in revenues, and suggests that artists could be remunerated based on demand calculated through services such as Billboard.com and tracking file sharing.[45] Netanel has a detailed proposal for a levy that would apply to a broad range of media products and in exchange legalizes peer-to-peer (P2P) file-sharing and non-commercial remixes so long as the original author is credited.[46] His proposal would permit the free exchange of several kinds of copyrighted works including movies and music but not computer programs, and would result in a levy of about 4% being placed on range of copying related technologies from CD burners to VCRs, blank digital media, computers, and internet access.[47] He argues that such a levy

would be able to compensate creators and rights holders for their losses and prevent users who do not engage in file sharing from having to cross subsidize heavy users of P2P.[48] Fisher advocates for a levy system similar to the one proposed by Netanel.[49] Though his proposed levy would apply to a range of goods, he suggests that the primary source of revenue come from an ISP levy.[50] However, Fisher acknowledges that a system of funding artists through general taxation, though less appealing politically, would be superior to a levy system.[51] Lessig endorses Fisher's levy system, though he believes that the use of levies should be a temporary measure.[52] Specifically he proposes a system that would generate revenue to compensate for lost CD sales, but allow noncommercial sharing of copyrighted materials that are no longer available for sale and works that are not protected by copyright.[53] Litman examines the proposals of Lunney, Ku, Netanel, and Fisher concluding that that when confined to music (and not extended to other kinds of works) they represent sensible solutions that simply extend existing laws and business practices.[54] However, Litman suggests that rights holders should have the option to opt out of the levy system and restrict their works from being shared online.[55] In their analysis of the Finnish levy system, Oksanen and Valimaki conclude that a flat $5 broadband connection levy would serve as a suitable mechanism for remunerating artists.[56] However, they suggest that the levy and the necessary changes to Finnish copyright law would likely run afoul of TRIPS Article 13 which limits exceptions to copyright to those that do not conflict with normal exploitation of the work.[57] Ultimately they conclude government subsidy of artists, although politically unpopular, would be more practical than an internet levy.[58] Finally, Allison has examined a range of solutions for dealing with the challenges posed by file sharing in a report prepared for the Department of Canadian Heritage.[59] She compares several different models including a levy system, a TPM based system to reduce file-sharing, a continuance of the status quo and increased enforcement and concludes that a levy system would be attractive for its ability to curb litigation and enforcement costs.[60] Despite the advantages of a levy system, she does not recommend any single approach and calls for more research.[61] Numerous scholars have addressed the idea of a levy system, and while each proposal contains its own intricacies and limitations, they serve as a useful reference point to contrast and analyze the SAC proposal.

While some scholars have advocated for a levy system, there have also been arguments made against the use of levies. Liebowitz notes that levies distort the market for goods they are placed on.[62] He notes that calculating the size of the levy as time progresses becomes increasingly difficult because there is no market to signal the appropriate value.[63] Finally he suggests the levy will result in cross-subsidization where those who do not engage in infringing activity end up subsidizing those who do, and that artists will also suffer as it will be difficult to determine the amount of remuneration for each artist.[64] Eckersley posits that a residential ISP levy with the value of the levy dependent on the property value would be superior to a flat ISP levy; however, he notes that such propositions are politically unviable and unconstitutional in the United States.[65] deBeer has examined the potential for levies with a specific focus on Canada.[66] He claims that levies constitute a subsidy, and that direct government subsidization would be preferable as it could be used to better promote Canadian music and culture.[67] deBeer argues that levies may be unconstitutional, and would violate the Berne three step test that limits exceptions to copyright.[68] Echoing the concerns raised by Liebowtiz, deBeer highlights the problems of cross-subsidization and market distortion.[69] Yu finds five deficiencies with levy proposals.[70] He suggests it will be difficult to determine how to allocate revenues if sufficient revenues can even be collected, create cross subsidization and market distortion, and rewards file sharers who have engaged in illegal conduct while it penalizes rights holders.[71] He concludes by noting that legal changes alone cannot solve the problem posed by file sharing and that a comprehensive solution must consider the logic of markets, technological infrastructures and the role of social norms.[72] Merges believes that compulsory licensing schemes including levies will bring some short term gains but are detrimental in the long run.[73] He argues that negotiations over the amount of remuneration will induce rent seeking and become increasingly costly over time and undermine the proper function of intellectual property markets.[74] Gratz reviews the proposals of Fisher, Netanel and Litman concluding that two former proposals simply represent unjustified transfer of wealth from rights holders to artists, while concluding that Litman's suggestions are morally indefensible as they limit artists' rights.[75] Davidson has examined the issue of ISP levies in Canada and while he feels that the use of such levies would not act as a fetter on internet usage, he suggests that such a levy

would cause serious problems with regards to national treatment. Foreign nationals would likely contest Canadians being given free access to copyrighted material.[76] A review of the literature critical of levies reveals several common arguments against levies (cross subsidization, market distortion, calculating and distributing the remuneration and international implications) that a thorough levy proposal would have to address.

The Songwriters Association of Canada has attracted some minor commentary from the academic community, though in its current form it has not received a substantive analysis. Hébert analyzed an earlier version of the SAC proposal in 2008.[77] Though Hébert concludes that the SAC proposal is one with great promise, the SAC levy is only mentioned in two sentences and there is no discussion of how the proposal would function or how potential problems with an ISP levy would be overcome. Furthermore, the report is clearly biased as it was written for the SAC.[78] Sookman has written a detailed analysis of the SAC's levy proposal and found that it would not meet the limitations on exceptions to copyright found in the Berne Convention, TRIPS, the North American Free Trade Agreement (NAFTA), and the Rome Convention.[79] However, because the proposal has been modified, Sookman's conclusions no longer hold. In 2010, Gervais concluded that the SAC's then current proposal, an ISP levy that would allow rights holders to opt out, would not run afoul of international treaties.[80] Finally, Goel, Miesing and Chandra, note the SAC proposal as an example of an ISP levy in their analysis of the impact of file sharing on the media industry, but do not assess the proposal in any detail.[81] Simply put, to date there has been no critical analysis of the Songwriters Association of Canada proposal, and any discussion to date has focused on the SAC's levy proposal which it has now abandoned in favour of a voluntary ISP monthly fee.

Notes to Chapter Two:

[1] For a general description of the cases see chap. 1, s. VII.C.
[2] The *IBM Technical Disclosure Bulletin* has been published since 1958,and the status of defensive publishing has not been investigated (Scott Baker and Claudio Mezzetti, "Disclosure as Strategy in the Patent Race," *Journal of Law and Economics*, 48. (Apr 2005), 174;. Johnson, "Defensive Publishing by a Leading Firm," 3.
[3] Gideon Parchomovsky, "Publish or Perish," *Michigan Law Review*, 98(4), (2000), 926-952.
[4] Parchomovsky, "Publish or Perish," 929-30.
[5] Parchomovsky, "Publish or Perish," 943.

[6] Douglas Licthman, Scott Baker and Kate Kraus, "Strategic Disclosure in the Patent System," *Vanderbilt Law Review*, 53(6), (Nov. 2000), 2198, 2204-05.
[7] Litchman, Baker and Kraus, "Strategic Disclosure in the Patent System," 2188, 2201.
[8] Oren Bar-Gill and Gideon Parchomovsky, "The Value of Giving Away Secrets," *Virginia Law Review*, 89(8), (Dec. 2003), 1861, 1873.
[9] Bar-Gill and Parchomovsky, "The Value of Giving Away Secrets," 1888.
[10] Talia Bar, "Defensive Publications in a R&D Race," *Journal of Economics and Management Strategy*, 15(1), (Spring, 2006), 230.
[11] Bar, "Defensive Publications in an R&D Race," 244.
[12] Baker and Mezzetti, "Disclosure as a Strategy in the Patent Race,"
[13] Carlos J. Ponce, "More Secrecy… More Knowledge Disclosure? On Disclosure Outside of Patents," *European University Institute (EUI) Working Paper MWP 2008/02*, (2008), 4: http://cadmus.eui.eu/bitstream/handle/1814/8091/EUI-MWP-2008-02.pdf?sequence=1
[14] Ponce, "More secrecy…," 19.
[15] David Gill, "Strategic Disclosure of Intermediate Research Results," *Journal of Economics and Management Strategy*, 17(3), (Fall 2008), 753-54.
[16] Rebecca Eisenberg, "The Promise and Perils of Strategic Publication to Create Prior Art: A Response to Professor Parchomovsky," *Michigan Law Review*, 98(7), (Jun. 2000), 2361.
[17] Eisenberg, "The Promise and Perils of Strategic Publishing to Create Prior Art," 2368.
[18] Robert P. Merges, "A New Dynamism in the Public Domain," *University of Chicago Law Review*, 71(1) (Wint. 2004), 185
[19] Heller, *The Gridlock Economy*, 72.
[20] Thomas J. Colson, "Defensive Publishing: Protect Your Intellectual Property," *Machine Design*, 73(6), (Mar. 2001), 72-74; Thomas J. Colson, "Leveraging the Power and Value of Intellectual Property," *Ivey Business Journal*, (July/August 2001), 29-33.
[21] Colson, "Leveraging the Power and Value of Intellectual Property," 32-33.
[22] Colson, "Defensive Publishing," 74.
[23] Bill Barrett, "Defensive Use of Publications in an Intellectual Property Strategy," *Nature Biotechnology*, 20, (Feb. 2002), 193.
[24] Stephen Adams and Victoria Henson-Apollonio, "Defensive Publishing: A Strategy for Maintaining Intellectual Property as Public Goods*," International Service for National Agricultural Research Briefing Paper*, 54, (Sept. 2002), 5-6.
[25] Adams and Henson-Apollonio, "Defensive Publishing," 2.
[26] Sara Boettiger, "Issues in IP Management to Support Open Access in Collaborative Innovation Models," *First Monday*, 12(6), (June 2007): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/rt/printerFriendly/1869/1752
[27] Baker and Mezzetti, "Disclosure as a Strategy in the Patent Race," 188.
[28] Johnson, "Defensive Publishing by a Leading Firm," 14.
[29] Johnson, "Defensive publishing by a Leading Firms," 18.
[30] Joachim Henkel and Florian Jell, "Alternative Motives to File for Patents: Defensive Publishing in the Patent System," *Paper Presented at the 3rd Annual Conference of the European Policy for Intellectual Property (EPIP) Association*, Berne, Switzerland Oct 3-4, 2008, 11, 15: http://www.epip.eu/conferences/epip03/papers/Jell_20080920_Henkel_Jell_DP_in_the_Patent_System.pdf
[31] Henkel and Jell, "Alternative Motives to File for Patents," 15.
[32] Joachim Henkel and Stefanie Pangerl, "Defensive Publishing: An Empirical Study," *DRUID Working Papers*, 08-04, (2008), 11: http://www3.druid.dk/wp/20080004.pdf
[33] Henkel and Pangerl, "Defensive Publishing," 17, 21, 23.
[34] The EU specifically allows for nations to implement private copying levies in Directive 2001/29/EC, Art 5(2)(b) (European Parliament and the Council of the European Union, Directive 2001/29/EC of the European Parliament of the Council of 22 May 2001 On the Harmonization of Certain Aspects of Copyright and Related Rights in the Information Society (2001)).
[35] Natali Helberger and P. Bernt Hugenboltz, "No Place Like Home for Making a Copy: Private Copying in European Copyright Law and Consumer Law," *Berkeley Technology Law Journal*, 22, (2007), 1078.
[36] Constanze Ulmer-Eilfort, "Private Copying and Levis for Information – and Communication-Technologies and Storage Media in Europe," *Lecture Notes in Computer Science*, 2770, (2003), 447.

[37] Ulmer-Eilfort, "Private Copying and Levies for Information- and Communication-Technologies and Storage Media in Europe," 448.
[38] Peter Mezei, "Fair Use and Culture: Comments on the Gowers Review," *University of Toledo Law* Review, 39, (2008), 664.
[39] Andrew F. Christie, "Private Copying License and Levy Schemes: Resolving the Paradox of Civilian and Common Law Approaches," in *Intellectual Property in the New Millennium*, D. Vaver and L. Bently eds., (Cambridge: Cambridge University Press, 2004), 248.
[40] Christie, "Private Copying License and Levy Schemes," 252-53.
[41] Glynn S. Lunney, "The Death of Copyright: Digital Technology, Private Copying and the Digital Millennium," *Virginia Law Review*, 87(5), (Sept. 2001), 912.
[42] Lunney, "The Death of Copyright," 917.
[43] Lunney, "The Death of Copyright," 912.
[44] Raymond Shih Ray Ku, "The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology," *University of Chicago Law Review*, 69(1), (Wint. 2002), 313.
[45] Ku, "The Creative Destruction of Copyright," 314.
[46] Neil Weinstock Netanel, "Impose a Noncommercial Use Levy to Allow Free Peer-to-Peer File Sharing," *Harvard Journal of Law and Technology*, 17(1), (2003), 4.
[47] Netanel, "Impose a Noncommercial Use Levy to Allow free Peer-to-Peer File Sharing," 41, 63.
[48] Netanel, "Impose a Noncommercial Use Levy to Allow free Peer-to-Peer File Sharing," 74.
[49] Both Netanel and Fisher acknowledge the similarities in their proposals, with Fisher noting that Netanel's work was pioneering (Nentanel, "Impose a Noncommerical Use Levy to Allow free Peer-to-Peer File Sharing," 4, William W. Fisher III, *Promises to Keep: Technology, Law, and the Future of Entertainment*, (Stanford: Stanford University Press, 2004), 217.
[50] Fischer, *Promises to Keep*, 219.
[51] Fischer, *Promises to Keep*, 223.
[52] Lawrence Lessig, *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*, (New York: Penguin, 2004), 301.
[53] Lessig, *Free Culture*, 303.
[54] Jessica Litman, "Sharing and Stealing," *Hastings Communications and Entertainment Law Journal*, 27, (2004), 36.
[55] Litman, "Sharing and Stealing," 39
[56] Ville Oksanen and Mikko Valimaki, "Copyright Levies as an Alternative Compensation Method for

[70] Peter K. Yu, "P2P and the Future of Private Copying," *University of Colorado Law Review*, 76, (2005), 708.
[71] Yu, "The Future of Private Copying," 708-712.
[72] Yu, "The Future of Private Copying," 764.
[73] Robert P. Merges, "Compulsory Licenses vs. the Three 'Golden oldies:' Property Rights Contracts and Markets, *CATO Institute Policy Analysis 508*, (2004), 5: http://www.cato.org/pubs/pas/pa508.pdf
[74] Merges, "Compulsory Licenses vs. the Three 'Golden Oldies,'" 9-10.
[75] Joseph Gratz, "Reform in the 'Brave Kingdom': Alternative Compensation Systems for Peer-to-Peer File Sharing," *Minnesota Journal of Law, Science and Technology*, 6(1), (2004), 418-19.
[76] John Davidson, "Rethinking Private Copying in the Canadian Digital Age," (LLM diss., University of Toronto, 2001), 68-69.
[77] Jean Hébert, "On the Proposal to Initiate a Blanket Levy System for Internet Service Providers to Enshrine Creators' 'Rights to Remuneration:' A Report on the Socio-technical Dimensions of Digital Music Prepared of the Songwriters' Association of Canada," (2008): http://clicknoise.net/wp-content/uploads/2008/02/sac-report.pdf
[78] Hébert, "On the Proposal to Initiate a Blanket Levy System for Internet Service Providers to Enshrine Creators' 'Rights to Remuneration," 1.
[79] Barry Sookman, "The SAC Proposal for the Monetization of the File Sharing of Music in Canada: Does It Comply with Canada's International Treaty Obligations Related to Copyright," *Osgoode Hall Review of Law and Policy*, 1(2), (2008), 132.
[80] Daniel Gervais, "User-Generated Content and Music File Sharing: A Look at Some of the More Interesting Aspects of Bill C-32," in *From Radical Extremism to Balanced Copyright: Canadian Copyright and the Digital Agend*a, Michael Geist (ed.), (Toronto: Irwin Law, 2010), 463.
[81] Sanjay Goel, Paul Meising, and Uday Chandra, "The Impact of Illegal Peer-to-Peer File Sharing on the Media Industry," *California Management Review*, 52(3), (Spring 2010), 32, n. 56.

Chapter Three – The Expansionary Intellectual Property Regime

The expansionary IP regime has been marked by several trends in the area of intellectual property over the last 35 years. Traditional IP mechanisms have expanded in scope of coverage and term of protection. New forms of IP protection have arisen to cover a wide range of intellectual goods from semiconductor chip layouts to plant varieties. Concomitant with these changes is the incorporation of IP within the global trade system and increasing economic importance of IP. This chapter is not an exhaustive description of all the expansionary changes, nor is it a detailed discussion of the nature of patents and copyrights themselves.[1] A complete cataloguing of all changes is beyond the scope of the chapter. Rather this chapter aims to provide an overview of the expansionary regime, identifying both its breadth and depth.

A survey of the nature of the expansionary IP regime is necessary to demonstrate the range of changes that have occurred. While not all expansionist policies have been adopted in all countries and some countervailing tendencies exist, when viewed in its totality the expansionary regime evinces a sustained and pervasive trend towards the increased commodification of intellectual goods through exclusionary IP rights. An analysis of the expansionary IP regime forms the contextual background against which support for substantive alternatives to IP is based.

I. Expanse of Traditional IP Mechanisms (Copyright and Patent)

A. Copyright Expansion – Term, Scope and Enforcement

Both copyright and patent law have seen increases in the term and scope of protection over the past 35 years. The following section details the expanse of these rights, focusing in particular on changes in the United States (where such changes have been most pronounced), but also highlighting some notable trends in other jurisdictions.

Beginning with the 1976 *Copyright Act*, there have been two substantive increases in the term of copyright protection in the United States. The 1976 act greatly increased the term

of protection; the term of protection increased from a 28 year term with the option of a single renewal for an additional 28 years of protection (for a total term of 56 years of protection) to life of the author plus 50 years of protection after their death (life plus 50). Works made for hire (i.e. copyrights held by corporations) lasted for either 75 years after first publication or 100 years after first creation with the term expiring whenever the first of these conditions is met.[2] This change brought the United States in line with many other national governments as life plus 50 was a requirement of the Berne Convention, which the U.S. was still not party to at this time.[3] The 1976 changes not only significantly extended the term of copyright in the United States, but also signaled that the U.S. had a clear interest in modernizing and strengthening its protection for creative and artistic works.

In 1998 with the term on many major U.S. copyrights including Disney's Mickey Mouse character set to expire, the copyright term was further extended. For works by individuals the term was extended to the life of the author plus 70 years, and both conditions for works made under hire were also extended by 20 years.[4] Though welcomed by Hollywood and other copyright intensive industries, the Sonny Bono *Copyright Term Extension Act* (CTEA) of 1998, did attract significant opposition including a legal challenge of its constitutionality (*Eldred v. Ashcroft*[5]) which reached the Supreme Court in 2002. Despite arguments in support of the petitioners, including an *amici curiae* brief by 17 famous American economists, five of whom were Nobel Laureates, that argued the CTEA provided no new incentives to innovate and was injurious to consumer welfare,[6] the Supreme Court upheld the constitutionality of the law in a 7-2 vote.[7] The majority decision specifically held that, "The CTEA may also provide greater incentive for American and other authors to create and disseminate their work in the United States."[8] The decision of the majority explicitly rejected the economists' brief that calculated a 20 year extension would only increase the present value of payments to authors by less than half of one percent.[9] The CTEA and decision in the *Eldred* case reflect a clear American interest in extending the term of copyright protection in an effort to provide greater pecuniary incentives.

The increases in copyright length in the U.S., however, should not be seen as exceptional.

A number of countries have lengthened the copyright term beyond the life plus 50 years requirement found in Berne and TRIPS.[10] Five years before the CTEA, the Council of the European Communities (forerunner to the Council of the E.U.) passed Council Directive 93/98/EEC which stated that the duration of copyright in member states should be harmonized at life plus 70 years.[11] Amendments to Directive 93/98/EEC in 2006 reaffirmed the E.U.'s harmonization goal of a life plus 70 years term.[12] In 2003 Mexico surpassed both the E.U. and U.S. by declaring a life plus 100 years copyright term.[13] Unlike many other developed nations, Canada has not endeavored to recently extend the term of copyright protection, which remains at life plus 50.[14] None of the four most recent proposed copyright modernization bills[15] included a term expansion.[16] While the Canadian example demonstrates that the recent extension of copyright term is not universal, there has been a general trend towards longer and longer terms of protection. Even though the U.S. Constitution explicitly forbids an infinite copyright there have been advocates for indefinitely renewable copyrights.[17] Thus the discussion around perpetual copyright has already begun.[18]

The significant expanse in the term of protection for copyrights has mirrored a similar increase in the scope of protection. Though there has been a general historical trend to expand the scope of copyright to allow for new mediums of creative and artistic works (namely sound recordings and motion pictures/other audiovisual works), there have been two significant expansions to the scope in the past 30 years. The most significant of these changes is the consideration of computer software as a literary work and therefore subject to copyright, which occurred in 1980 in the U.S.[19] The decision to add software to the domain of copyright in the U.S. was driven by the National Commission on New Technological Uses of Copyrighted Works (CONTU) report to Congress.[20] The report concluded that extending copyright protection to software would not result in software monopolies.[21] At the time the research for the report was conducted there were only 200,000 microcomputers in the U.S.[22] Menell's study of the impact on copyright law on software innovation concluded that while copyright does facilitate some innovation in the development of programs it blunts other positive network externalities and provides for an overly long term of protection.[23] By 1994, TRIPS explicitly declared that computer programs be considered literary works, effectively securing near global inclusion of

software within the copyright system.[24] While the expansion of copyright earlier in the 20th century to include audio and then audiovisual works reflected a logical extension of the idea of protecting artistic works, the more recent enlargements of copyright are indicative of expansionary IP regime that seeks to create new markets by commodifying increasingly diverse forms of intellectual work.

A discussion on the expanse of copyright would be incomplete without reference to two other important developments – the ratcheting up of penalties for infringement, and legal protection for technological protection mechanisms that increasingly are used in addition to legal means to restrict access to copyright works. In the U.S., while there have been several legislative changes that have increased the penalties for copyright infringement[25] the most far reaching of these changes was the *Digital Millennium Copyright Act* (DMCA) (1998), which was passed in the U.S. to implement two 1996 WIPO treaties.[26] The DMCA prohibits circumvention of technological protection measures (TPMs) essentially providing copyright owners who use TPMs a second layer of legal protection for their works.[27] The DMCA also criminalized devices and services whose primary purpose is circumventing TPMs.[28] Both of these legal protections were backed by substantive civil and criminal penalties.[29] In addition to the protection for TPMs, the DMCA contained safe-harbor provisions in the form of a notice and takedown system aimed at providing internet service providers a method for limiting their own liability.[30] Unfortunately, the notice and take down system incentivizes rights holders to be overzealous in claiming infringement and motivates ISPs and end-users to takedown material without a thorough examination of whether its use is infringing.[31] The DMCA is illustrative of the third dimension of copyright expansionism, the increase in the severity of penalties for infringement and the extension of copyright protection to include anticircumvention legislation.

An effort to increase the strength of protection afforded by copyright continues to remain an important dimension of the expansionary regime. The currently pending Canadian copyright bill (Bill C-11) would introduce broad protection for TPMs and allows for only limited circumstances where circumvention would be permitted.[32] Particularly worrisome is the fact that the pervasive TPM restrictions would prevent circumvention

even when it is done for what would be otherwise non-infringing activity such as exercising one's fair dealing rights.[33] At the time of writing Congress is also considering further increasing penalties for copyright infringement. *The Commercial Felony Streaming Act* (S 978)[34] aims to make it a felony to cover songs and upload them to YouTube with commercial intent.

The marked increase in penalties for copyright infringement reflects the overall expansionary nature of the copyright regime, particularly in the U.S. Beginning with the 1976 *Copyright Act*, which has been amended over 60 times since,[35] there has been a steady expansion in the scope and term of copyright with a corresponding increase in penalties for infringement.

B. Patent Expansion – Term, Scope, and Pro-Patent Institutions

While the expansionary nature of the IP regime is clearly evident in copyright policy, it has also been mirrored in changes to patent policy, most notably with respect to the scope of patentable subject matter. Extensions to the term of patent protection, in light of the numerous other expansionary trends in IP, are relatively minor through still reflective of an overall trend towards greater rights protection. In the last two decades of the 20th century patent terms have been extended to 20 years (up from 17 years) in a number of jurisdictions.[36] The 20 year level of protection has become the effective global standard with the completion of TRIPS in 1994.[37] Although the extension of patent term protection is only three years, it still represents a nearly 18 percent increase in the duration of protection.

The pharmaceutical sector has also received special consideration with respect to patent term. The 1984 *Drug Price Competition and Patent Term Restoration Act* (also known as the *Hatch-Waxman Act*) provides the USPTO with the authority to extend patents for pharmaceuticals that undergo lengthy regulatory review,[38] and also made it easier for drug companies to enforce their IP rights against manufacturers of generics.[39] European drug companies enjoy similar benefits. Supplementary Protection Certificates established in European Economic Community Council Regulation (EEC) No. 1768/92, and furthered by European Community Regulation (EC) No. 1610/96, provide prolonged

intellectual property protection for medical, pharmaceutical, and plant protection products that, while subject to patent, require additional protection with regards to term due to the lengthy regulatory and approval processes involved.[40] Although the increased term for patent protection provides owners an increased period of insulation from competitors, the expansionary trends in patent policy have been most pronounced with respect to a broadening of scope.

The scope of patents (that which is considered patentable subject matter) has been heavily influenced by the decisions of the USPTO and higher level courts including the U.S. Supreme Court, which have decided a number of precedent setting patent cases. Ananda Chakrabarty's controversial 1972 patent application for a human made micro-organism was ultimately decided in a 5-4 Supreme Court ruling in 1980 (the *Diamond v. Chakrabarty* case). Not only did the majority decision hold that a human made bacterium was patentable; the court went even further by quoting a 1952 Congressional Committee Report that argued "anything under the sun that is made by man," is patentable subject matter.[41] Following the precedent set in the *Diamond v. Chakrabarty* case, the USPTO granted Patent No. 4,736,866 to Harvard College in 1988 for a transgenic mouse.[42] Though the transgenic mouse's susceptibility to cancer was certainly novel and useful for important oncology research, the patent demonstrated that the USPTO was increasingly adopting the doctrine expressed by the Supreme Court that possessing the quality of life should not be a barrier to patentability.

While the 1980s saw the expanse of patentable subject matter to include various forms of life beyond plants, the scope of patentability was further expanded in the 1990s by granting patents for business methods and software in the U.S. Though the U.S. Supreme Court decision in the 1972 case *Gottschalk v. Benson* rejected a computer program that converted decimal numbers into binary, a quarter century later software emerged as a clearly patentable subject matter.[43] In 1993 a patent was granted to Signature Financial Group for a financial data processing system.[44] The decision was held up on appeal to the U.S. Court of Appeals for the Federal Circuit. Justice Rich, who forty years earlier explicitly rejected the notion that business methods could be patented,[45] writing for the court stated:

> Today we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result" – a final share price…[46]

Though the 1981 Supreme Court case *Diamond v. Diehr* held that software was patentable when it represented a 'process,'[47] the 1996 *State Street Bank* decision considerably expanded patentable subject matter beyond processes to 'methods,' including computerized, software based business methods.[48] The trend towards business methods patents led to Amazon's patenting of its '1-Click' online shopping method,[49] the patenting of a step-by-step method of custodial instruction,[50] and even a method of putting in golf.[51] Recent court decisions by the Court of Appeals for the Federal Circuit, and U.S. Supreme Court in the *Bilski* case (*Bilski v. Kappos*) have helped to clarify the patentability of business methods to a degree.[52] Although the Supreme Court did not endorse the notion that all processes were necessarily patentable, it clearly stated that court had no intent to make business methods unpatentable.[53] The court also recognized the potential problems of business method patents stating, "if a high enough bar is not set when considering patent applications of this sort [business methods], patent examiners and courts will be flooded with claims that would put a chill on creative endeavor and dynamic change."[54] Although the patentability of business methods remains an unresolved issue, the expansion of patentable subject matter to include a variety of living mechanisms demonstrates the expansionary nature of the IP regime.

The tendency in U.S. policy towards expansionary patent scope has been far more measured in other regions. Australia, South Korea and Japan allow business methods patents;[55] however, the European Patent Convention explicitly prevents the patenting of computer software and non-technical business methods.[56] The Canadian Intellectual Property Office (CIPO) does allow for patents on software in some cases; however, a number of functional elements must be present which greatly limits the availability of software patents.[57] CIPO also explicitly rejects many business methods patents in fields such as economics, law, and marketing by noting that such areas are not fields of technology.[58] However, a recent Federal Court decision regarding Amazon.com's 1-click business method has stated that there is no business method exception in Canadian law.[59]

An appeal of the case was heard by the Federal Court of Appeal on June 21, 2011, and the court ruled that Amazon.com's patent application be re-examined on an expedited basis.[60] Stemming from the Federal Court decision in the *Amazon.com* case the Canadian Commissioner of Patents has revised the *Manual of Patent Office Practice* to state that "electronic processes within a computer are considered to satisfy the requirement for a physical change,"[61] allowing for a greater range of patentable methods. Canada also allows the patenting of "lower life forms" such as microscopic algae, bacteria, viruses, and multipotent stem cells, but not "higher life forms" which includes animals, seeds, and fertilized eggs (plant varieties are protected under the *Plant Breeder's Rights Act*).[62] The Harvard Mouse patent was also rejected in Canada with appeals of the decision reaching the Supreme Court that decided a higher level life form was not patentable.[63] In 2003 a more limited patent was granted to Harvard College in Canada for the transgenic mouse, but only after claims to the composition of matter had been removed.[64] In its decision the Supreme Court rejected the view expressed by the U.S. Supreme Court in *Diamond v. Chakrabarty* that anything under the sun made by humans is patentable.[65] The European Patent Office granted a patent for the Harvard Mouse in 1992,[66] and a 1998 E.U. directive aimed at harmonizing patent laws allows for the patenting of plants or animals with human introduced genetic properties, but not the patenting naturally occurring plant and animal varieties.[67] While there has been some expansion in scope in other jurisdictions, the expansionary trends are most pronounced in the United States.

The final dimension of the expansion of patent law that requires noting is not an expanse per se, but a structural change in U.S. patent administration. In 1979 the USPTO stopped issuing patents for a brief period,[68] resulting in only 48,854 utility patents being issued that year and the first time in the previous 15 years that the number fell below the 50,000 mark.[69] Since the end of the 1970s, the United States has crafted a policy environment that encourages patenting resulting in nearly 220,000 utility patents being granted in 2010[70] – a nearly four and half fold increase in thirty years. The 1980 *Bayh-Dole Act*, which allows universities and small businesses to patent inventions that result from federally funded research, provided an early indicator of the increasingly pro-patent attitude in the United States.[71] The *Bayh-Dole Act* was complemented by the *Stevenson-Wydler Technology Innovation Act of 1980* that allowed government employees to seek

patents for federally funded research in certain situations.[72] Four years later some of the restrictions in the *Bayh-Dole Act* were eliminated to facilitate more university patenting.[73] In 1982 the U.S. Court of Appeals for the Federal Circuit (CAFC) was created through a merger of the appellate section of the U.S. Court of Claims and the Court of Customs and Patent Appeals.[74] The CAFC has brought increased consistency and coherency to judgments in patent appeal cases;[75] however, it has done so by adopting a decidedly pro-patent attitude. In one of the earliest empirical studies Robert Merges argued that the Federal Circuit, "assumes a simplistic conceptual model of innovation."[76] He further argued that the Federal Circuit's approach to evidence and downplaying of the requirement of non-obviousness rewarded non-technical innovations such as superior marketing programs of distribution systems.[77] As a result commercial success is now viewed by the CAFC as an indicator of non-obviousness.[78] Although market sales can indicate that a new product was not obvious, sales can also result from other factors that have nothing to do with the degree of obviousness including effective marketing. Through its decisions the CAFC has eliminated the best mode requirements[79] for software,[80] undermined the principle that patents should only be granted on technologies at or near practical application,[81] and in *Madey v Duke* (2002) it narrowly interpreted the research exception indicating that university researchers operating on a non-commercial basis could still be liable for infringement.[82] In 2003 the U.S. Supreme Court refused to hear an appeal in the *Madey v. Duke* case cementing the CAFC's narrow interpretation of the research exception.[83] In a 2003 study, Landes and Posner found that the Federal Circuit has resulted in an increase in: the number of patent applications, the success of those applications, and the overall amount of patent litigation, with the only confounding factor being the more pro-patent attitude of the USPTO,[84] and Posner has called the CAFC "extraordinarily pro-patent."[85] Finally the U.S. International Trade Commission, which has the power to ban imported goods that infringe on American IP at the border, is increasingly being used as an alternative venue to civil litigation for firms looking to maximize the legal leverage their IP rights provide.[86] The pro-patent attitude at the USPTO and Court of Appeals for the Federal Circuit, along with the forum-shopping provided by the ITC have reinforced the expansionary trends in patent policy.

The past 35 years have seen a significant expansion of the two traditional mainstays of

intellectual property – copyright and patents. In addition to longer terms more material is available for protection, and there has also been a significant expanse in terms of penalties with reference to copyright and an increasingly pro-patent attitude at both the USPTO and the Court of Appeals for the Federal Circuit. The expansionary tendencies have manifested themselves most prominently in the United States, although other countries have also seen some expansionary trends. For example, since the late 1990s Japanese policymakers have adopted a more pro-patent policy.[87] This general expansionary tone, along with the creation of several new *sui generis* IP mechanisms, provide for an increasingly broad array of mechanisms for protecting and commodifying intellectual work.

II. Rise of *Sui Generis* Mechanisms for IP Protection

At the beginning of the 20th century there existed only a handful of IP devices (copyright, patent, trademark and industrial designs). Over the course of the second half of this century the number of IP mechanisms increased by nearly a dozen. While these new devices tend to be narrower in scope, they reflect a broader trend towards more IP protection. Often these new mechanisms are created to facilitate commodification of intellectual goods that traditional IP devices did not protect. The expansionary nature of *sui generis* mechanisms is best evinced in four new areas: semiconductor layouts, databases, geographical indicators, and plant varieties, though several other mechanisms have also been created.

Legal protection for semiconductor layouts (also known as mark works or integrated circuit topographies) is one of the newest forms of IP, but also a *sui generis* mechanism that demonstrates considerable expanse despite its short history. The U.S. established protection for semiconductor layouts as a new IP mechanism in 1984 with an eight year term of protection.[88] Within five years an international treaty designed to protect semiconductor chips was negotiated in Washington, though the treaty never entered into force.[89] For proponents of increased protection, the perceived shortcomings of the Washington Treaty were addressed in the TRIPS Agreement. TRIPS incorporated the text of the Washington Treaty, but specifically excluded the section on compulsory

licensing.[90] Furthermore, the term of protection was extended by 25% to ten years.[91] While the short history of integrated circuit protection reflects the expansionary trend in IP, what is most puzzling is that a term of protection of eight and now ten years is needed for integrated circuits that have shown a consistent pattern of obsolescence in two years since the mid-1960s (Moore's Law).[92] The creation and extension of a unique mechanism for protecting semiconductor chips is just one of a pattern of new, expansionary *sui generis* mechanism.

A second *sui generis* mechanism that demonstrates the expansionary nature of IP is protection for databases. Traditionally copyright has held that a compilation of facts is not protectable subject matter. This view was reflected by the U.S. Supreme Court in the 1991 *Feist Publication Inc. v. Rural Telephone Service* case. In the *Feist* case the Court ruled that a compilation of facts was protected by copyright only if it involved some sort of original selection or arrangement and even in such a case the protection only covered the selection or arrangement not the underlying facts.[93] While the *Feist* decision provided quite limited protection for database arrangement, the E.U. took a decisive step towards database protection by creating a *sui generis* mechanism in 1996. Directive 96/9/EC explicitly protected the contents of the database from extraction and/or reuse.[94] Though no *sui generis* database protection exists in the U.S. or other non-European jurisdiction, the creation of a special mechanism to protect data demonstrates how new mechanisms are being created to go beyond the bounds of traditional IP devices.

A secondary *sui generis* IP mechanism that receives greater protection in Europe than in the U.S. is protection for Geographical Indicators (GIs). GIs are used to indicate that goods of a specific geographical origin have qualities, characteristics or a reputation that is tied to the place of origin (for example, champagne is from the Champagne region of France).[95] Though geographical indicators are often tied to agricultural products (recognizing that geography is linked with unique climatic factors that substantively influence the quality of the product), GIs are also applied in cases where a particular region has a well know reputation for producing a good (though the production quality could be equal or superior elsewhere). In 1989 the EEC introduced protection for some alcoholic drinks including wine and spirits,[96] and two years later expanded GIs to include

foodstuffs.[97] TRIPS also requires protections for GIs.[98] In the U.S., GIs are less numerous; however, the U.S. protects a number of foreign GIs (such as Jamaican Blue Mountain Coffee (from Jamaica), Cognac (from France), and Darjeeling tea (from India)) and some domestic GIs (Idaho potatoes, Florida oranges, Vidalia onions, Napa Valley wines, and Washington State apples).[99] Though GIs are conceptually similar to trademarks, the creation of new IP devices to provide new protections is another example of the expanse in *sui generis* forms of protection.

Since the Neolithic Revolution, the cultivation of various strains of plants has been a core dimension of food production. In 1961 the International Convention for the Protection of New Varieties of Plants (UPOV[100]) created a new *sui generis* mechanism for plant varieties effectively facilitating their commodification. UPOV covers all botanical genera and species including non-agricultural plants such as decorative flowers[101] with a minimum term of protection of at least 15 years (which was even longer for some species).[102] While traditional IP mechanisms at this time did not allow for the patenting of living materials, UPOV changed this tradition, and began the expanse of IP into living things.

In addition to these four *sui generis* mechanisms several other unique IP devices have also been created. Domain names are a new form of IP and are administered by the Internet Assigned Numbers Authority (IANA) (which in turn is part of the Internet Corporation for Assigned Names and Numbers (ICANN)). Under ICANN's Uniform Domain Name Dispute Resolution Policy, WIPO is the primary dispute resolution venue hearing 60 percent of all disputes.[103] The protection of encrypted satellite signals is provided for in a number of Free Trade Agreements.[104] The U.S. DMCA contained a special section establishing a *sui generis* protection mechanism for ship hull designs with a 10 year term.[105] Finally, even the Olympic Rings are a new form of IP protection covered by the WIPO administered Nairobi Treaty.[106] While some of these IP devices are quite limited and largely supplement existing mechanisms, they are indicative of the overall nature of the expansionary IP regime.

III. Incorporation of the IP System to the Global Trade System and Rise of

Economic Importance of IP

A. IP and Trade

The linking of the IP system with the global trade regime that occurred in the 1980s and 1990s is not the first time IP and free trade were discussed together. In the 1860s and 1870s proponents of free trade were some of the principal advocates for the anti-patent movement.[107] Though 19th century proponents of free trade saw exclusive rights as clearly contrary to the concept of free trade, a century later the U.S. and other advanced economies took an interest in tying IP to trade to take advantage of the powerful sanctions and enforcement mechanisms that the global trade system provided.

IP has been a global issue for over a century, specifically since the 1883 Paris Convention for the Protection of Intellectual Property and the 1886 Berne Convention for the Protection of Literary and Artistic Works. These two treaties were marked by the principles of minimum standards and nation treatment, but unlike recent developments allowed considerable flexibility in national implementation. By 1967 the need for an international body to promote the protection of IP and administer the Paris and Berne Conventions (along with several other international IP treaties that had been negotiated) led to the creation of a specialized United Nations agency - WIPO.[108] Though there had been numerous revisions to the text of Paris[109] and Berne[110] by the mid-1970s, discussions at WIPO were becoming increasingly difficult due to the large number of member countries. American disillusionment with WIPO (and in particular its lack of an enforcement mechanism for the treaties it administered) led to an emphasis of linking trade and IP starting in the Tokyo Round and gaining significant traction in the Uruguay Round of world trade talks.[111] Corporate lobbies from the entertainment, pharmaceutical and software sectors were instrumental in persuading the U.S. government to marry international trade rules with the IP system.[112] The 1987 General Accounting Office (GAO) report *Strengthening Worldwide Protection of Intellectual Property Rights* explicitly stated that the U.S. would advance stronger IP protection in bilateral discussions and at world trade negotiations.[113]

The Reagan administration's strategy (continued by successive administrations both

Democratic and Republican) of linking trade and IP bore early fruit. The 1998 Canada - United States Free Trade Agreement obliged both countries to work together in the Uruguay Round to strengthen IP protection.[114] By 1993 and the completion of the NAFTA, the provisions for IP protection were considerably expanded. Detailed requirements in Chapter 17 of the agreement cover a broad range of IP devices including, copyright, patents, semiconductor layouts, trade secrets, geographical indicators, industrial designs, and encrypted satellite signals.[115] In addition to the obligatory minimum standards for IP protection, the dispute resolution system in NAFTA allows for the suspension of benefits against a nation that violates the terms of the agreement. This clause is notable because it allows the suspension of benefits to be targeted to a sector of the economy where it can have meaningful effect; for example if Mexico does not hold up its copyright obligations to the levels specified in NAFTA, after going through the dispute resolution process Canada or the U.S. could suspend their NAFTA obligations to another sector of the Mexican economy (e.g. agriculture) to make the suspension more effective.[116] The NAFTA model of clear minimum IP standards and a flexible sanctioning system that could be targeted for maximum effect foreshadowed the global model of IP protection that would result at the conclusion of the Uruguay Round.

The culmination of the Uruguay Round of trade talks was the 1994 Marrakesh Agreement that not only established the World Trade Organization (WTO), but formally brought together three major trade agreements (the Multilateral Agreement of Trade in Goods (which itself included the General Agreement on Tariffs and Trade (GATT) and several other goods related trade agreements), the General Agreement on Trade in Services (GATS) and Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)).[117] Incorporating the texts of the Paris and Berne Conventions as well as other more recent IP treaties, TRIPS spelled out the minimum levels of IP protection required for a broad array of IP devices. Like NAFTA, the WTO agreements also included a powerful dispute resolution mechanism that provided for suspension of obligations in sectors that would prove effective.[118] TRIPS did contain some concessions to developing countries; it provided a transition period for member countries,[119] and Article 8(1) allows nations to formulate their laws so that public health, nutrition and the public interest in key economic sectors can be protected, but any such provisions must be

consistent with TRIPS.[120] The effectiveness of these measures is limited by the broad levels of IP protection that countries must adhere to. The agreement establishes a global floor for the minimum standard of protection for IP rights. Copyright protection must include software,[121] and patent protection must be available "in all fields of technology."[122] Lured by the potential for access to the lucrative American consumer market, developing nations adopted significantly higher IP laws often without full understanding of the implications.[123]

The experiences of developing nations at the Uruguay Round have resulted in changes at the most recent round of world trade talks, the Doha Round.[124] The 2001 Declaration on the TRIPS Agreement and Public Health not only allowed nations greater control over health policy, but also gave nations the right to grant compulsory licenses.[125] Another concession to the least developed nations came in 2005, when requirement that these nations be TRIPS compliant was extended from 2006 to 2013.[126] While developing nations have achieved some successes at the WTO's Doha Round, the U.S. has demonstrated a continued ability to strengthen IP rights by working through a variety of venues (forum-shopping).

Though frustrated with WIPO in the 1970s and 1980s, after the Marrakesh Agreement, the U.S. has displayed renewed interest in WIPO as a venue for expanding intellectual property rights. In the mid-1990s the U.S. championed two new copyright treaties at WIPO – the WCT[127] and the WIPO Performances and Phonograms Treaty (WPPT).[128] Though TRIPS was completed only a few years earlier the WCT and WPPT further expanded copyright protection for signatories. Under the terms of the WCT, databases are considered intellectual creations in their own right and protectable under the scope of copyright (a concession to European interests),[129] rental rights were restricted on a range of copyrighted material,[130] and most importantly member states were required to provide legal protection for TPMs and rights management systems.[131] The U.S. DMCA passed only two years later represented the maximalist approach with regards to meeting WCT requirements. Though not every U.S. proposal was successful at the WCT and WPPT negotiations, the two 'TRIPS-plus' treaties inflated the required levels of copyright protection beyond the TRIPS requirements.[132] While the TRIPS-plus WCT and WPPT

were successfully negotiated, proponents of the expansionary IP regime were unsuccessful in negotiating a WIPO database treaty.[133] Resistance to increased harmonization of patent practices has also stalled the proposed WIPO Substantive Patent Law Treaty that aims to limit a nation's ability to individually set standards for the conditions of patentability (novelty, utility and non-obviousness, among other measures).[134] Resistance to the Substantive Patent Law Treaty has been so great that WIPO is now no longer even working on the treaty.[135] The broader multinational resistance at WIPO and WTO has led to an American strategy of strengthening rights through bilateral negotiations.

While WIPO and the WTO have become increasingly difficult venues for proponents of the expansionary IP regime, several recent smaller multilateral agreements have included more expansionary trends. The Office of the United States Trade Representative (USTR) has led efforts to ratchet up international IP protection, and on October 1, 2011 eight nations signed the Anti-Counterfeiting Trade Agreement (ACTA) that aims to strengthen global IP enforcement.[136] ACTA will require signatories to provide effective enforcement against any act of infringement.[137] Furthermore, in the case of commercial copyright infringement, which includes activities carried out for an indirect economic or commercial advantage,[138] penalties must include both imprisonment and monetary fines sufficiently high to create a deterrent effect.[139] Reinforcing existing IP rights is also a discussion point in the recently announced Trans-Pacific Partnership trade negotiations taking place between nine countries.[140] The ongoing discussions between Canada and the E.U. to negotiate the Comprehensive Economic and Trade Agreement also include IP as one of a number of subjects under discussion.[141]

In addition to the use of smaller multilateral agreements, the U.S. in particular has adopted the strategy of strengthening IP rights by making them part of Free Trade Agreements (FTA). Using NAFTA as a model the U.S. negotiated 11 bilateral agreements in the 2000 to 2007 period, each with a specific chapter or article relating to IP.[142] In addition to the bilateral deals, the US signed multilateral agreements with six Central American nations in 2004.[143] The desire by the U.S.'s trading partners for unfettered access to its domestic market results in the American ability to have

considerable influence on the terms of the FTA and the amount of harmonization required with U.S. practices. The recently negotiated Korea – U.S. FTA requires Korea to change 169 of its national laws, while there are no changes required to American law.[144] Finally, the U.S. is also linking the topic of IP protection to Trade and Investment Framework Agreements (TIFAs) with a broad range of countries and regions.[145]

The ability of the U.S. to secure stronger levels of IP protection over the past 25 years has resulted in a carefully planned strategy of forum-shopping and leveraging the desire by other nations to access the U.S. market. By linking IP with trade, an even more important mechanism for expanding IP rights has been realized – the powerful enforcement measures of trade treaties, and in particular the ability to retaliate where most effective when obligations are not upheld, represent one of the central dimensions in the expansionary nature of IP.

B. Economic Ascendency of IP

The linking of the global trade system with intellectual property rights is directly related to the increasing importance of IP both in the U.S. and in other advanced economies. Following a period in the late 1970s that was characterized by a decline in the number of U.S. patents granted, there has been a noticeable and substantive growth in the number granted (from 48,854 domestic utility patents in 1979 to 167,349 domestic utility patents in 2009), which coincides with the expanse of patent scope, term and protection.[146]

The increasing emphasis on IP has resulted in a number of efforts to improve enforcement and protection. In 1999, the U.S. created a special body, the National Intellectual Property Law Enforcement Coordination Council (NIPLECC), to coordinate IP enforcement activities at a number of federal departments,[147] and in 2008 the position of Intellectual Property Enforcement Coordinator within the Executive Office of the President was created.[148] The emphasis on IP protection in the U.S. has resulted in both a website (www.stopfakes.gov) and a toll-free hotline (1-866-999-HALT) for reporting IP infringement.[149]

The estimates of the contribution of IP industries to the overall U.S. economy are

substantial. According to a 2006 U.S. government estimate half of exports and 40% of economic growth can be attributed to IP industries.[150] In 2008, Secretary of Commerce Carlos Gutierrez suggested that the value of IP to the U.S. economy was 40% of GDP, or $5 trillion.[151] Estimates by industry associations also emphasize the importance of IP to the U.S. economy. The International Intellectual Property Alliance (IIPA) notes that "core" copyright industries alone contributed 6.44% of U.S. GDP in 2007,[152] and Business Software Alliance (BSA) estimates that in 2009 pirated software had a global value of $51.4 billion.[153] The Recording Industry Association of America (RIAA) argues that global music piracy results in the loss of 71,060 U.S. jobs.[154] Despite the increasing importance of IP to a number of U.S. industries, a recent GAO report cautions that many estimates on the effects of piracy and counterfeiting overestimate the monetary value of infringement of IP. The GAO notes that both the Federal Bureau of Investigation's (FBI) estimate piracy losses at $200-250 billion and Custom and Border Protection's estimate of 750,000 job losses due to counterfeiting cannot be substantiated.[155]

Although the exact value of IP to American industry is unclear, the estimates do reflect the increasing importance of IP industries to the overall American economy. Along with financial, business and professional services, IP intensive industries have helped sustain moderate U.S. growth levels, while American manufacturing has continued to decline. These broad structural changes in the makeup of the U.S. economy are generally reflected in western Europe, Japan and other advanced economies. The economic ascendency of IP has both been supported by and created pressure for expansionary IP policies.

IV. Countervailing Trends

Against the expansionary intellectual property regime there have been some countervailing developments. In addition to the Doha Declaration developing countries have been successful at preventing the WCT and WPPT from being incorporated into TRIPS, and WIPO treaties on database protection, harmonization of substantive patent laws and the rights of broadcasters and webcasters have been stalled.[156] WIPO has also adopted a Development Agenda that includes 45 recommendations that aim to ensure IP

obligations do not unduly encumber developing nations.[157] One of the recommendations specifically states that WIPO, "consider the preservation of the public domain within WIPO's normative processes and deepen the analysis of the implications and benefits of a rich and accessible public domain."[158] However, the success of developing nations at multilateral forums has been tempered by the increasing use of TRIPS plus requirements in bilateral trade agreements.

In Canada the current copyright bill would introduce a number of new changes that are not designed to principally benefit rights holders. Bill C-11 includes the expansion of fair dealing to include education, parody and satire[159] and several new exceptions such as UGC and format and time shifting;[160] however, all of these changes would be undermined by the pervasive new protections given to TPMs.

Although the United States is the nexus of the expansionary IP regime, there have been some non-expansionary developments. Language in decisions from several recent Supreme Court cases evinces that not all members of the high court believe that expanding IP protection is justified. The 2006 U.S. Supreme Court decision in *eBay v. MercExchange*[161] introduced a new four factor test that must be used before a permanent injunction will be issued as a result of an infringement case somewhat mitigating the power of business method patent holders.[162] In *Ebay* Justice Kennedy wrote in his concurring opinion that:

> When the patented invention is but a small component of the product that companies seek to produce and the threat of an injunction is employed simply for undue leverage in negotiations, legal damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest.[163]

Furthermore he noted that business method patents tended to be vague and of suspect validity.[164] In *KSR v. Teleflex*, the Supreme Court rejected the CAFC's test for non-obviousness noting that it set the bar too low for establishing non-obviousness and stated, "the results of ordinary innovation are not subject of exclusive rights under the patent laws."[165] In *Laboratory Corporation of America Holdings v. Metabolite Laboratories, Inc.*, Justice Breyer wrote in his dissenting opinion that, "too much patent protection can

impede rather than 'promote the Progress of Science and the useful Arts.'"[166] And most recently in the *Bilski* case, Justice Stevens argued, "the breadth of business methods, their omnipresence in our society, and their potential vagueness also invite a particularly pernicious use of patents that we have long criticized."[167] While the U.S. Supreme Court has not put a halt to the patenting of business methods, it is clear that at least some of the justices are concerned over how such patents can negatively impact innovation. With regards to copyright two recent bills that would expand the powers of copyright owners - the *Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property Act* (PROTECT IP Act) of 2011 (S 968),[168] and House of Representatives version of the PROTECT IP Act, the *Stop Online Piracy Act* (SOPA) (HR 3261)[169] – have now been stalled due to opposition from several major internet companies and websites including Google, Yahoo!, Amazon.com, Facebook, Twitter and Wikipedia.[170]

Finally, the recently passed *Leahy-Smith American Invents Act*[171] has delivered long awaited patent reform in the U.S. The act introduces numerous changes to the patent system including moving the U.S. from a first-to-invent to a first-to-file system, introduction of a post-grant review system allowing interested parties to challenge the validity of a patent after it is granted, and expanding the prior use defense from methods[172] to all kinds of patentable subject matter.[173] The Coalition for Patent Fairness, whose membership is largely comprised of large software and electronics companies,[174] supported the recent U.S. patent reforms,[175] while groups including the American Inventors for Patent Reform and National Small Business Association were critical of the changes.[176] While the aim of the act is to reduce unnecessary litigation and spur job creation and innovation,[177] because most of the act has yet to come into effect it remains unclear exactly how far the act will go in achieving this goal. Furthermore, the act is not without expansionary elements such as the weakening of the best mode requirement by eliminating the provision that would invalidate a patent when an inventor fails to disclose the best mode.[178] While these countervailing developments must be noted, the dominant trend is still towards expansionary IP rights, and both Canada and the U.S. have pending legislation[179] that would further serve the interests of rights holders while limiting the rights of end users.

V. Incentives and the Expansionary IP Regime

This chapter has provided an overview of the expansionary IP regime noting the increase of protection for traditional IP devices, the rise of *sui generis* IP mechanisms, and the linking of IP within the global trade system. The economic ascendency of IP and the expansionary IP regime should not suggest that society has entered some sort of novel epoch where intellectual work is prized, but instead reflects the tendency within capitalism to conquer new markets and commodify new goods and services. While the promotion of innovation is an important societal goal, policymakers in a number of jurisdictions, and the U.S. in particular, have chosen to incent innovative activity by relying on exclusionary rights that limit access but provide rights holders with increasingly lucrative means for appropriating the returns for their innovations.

Facilitating much of the expansionary trend has been an increased rhetoric on the importance of providing incentives for intellectual activity and a general exaltation of innovation. These economic shifts are a central driver for the U.S. to seek out stronger IP laws and have also given rise to an increasing discourse on the emergence of an information society.[180] The reliance on exclusionary rights to incent innovation would be justified if no other mechanisms existed to encourage artistic and creative work; however, the next chapter demonstrates that IP is not the sole incentive for innovation. The following chapter forms the first facet for differentiating between IP and its alternatives by critically examining the central concept of incentives in IP and innovation discourse.

Notes to Chapter Three:

[1] For a comparison of patents and copyrights see Vaver, *Intellectual Property Law*.
[2] *The Copyright Act of 1976*, Pub. L. No. 94-553, 90 Stat. 2541.
[3] Berne Convention for the Protection of Literary and Artistic Works, Sept. 9 1886, as revised at Paris on July 24, 1971 and amended in 1979, 1161 UNTS 3.
[4] *Sonny Bono Copyright Term Extension Act*, Pub. L. No. 105-298, 112 Stat. 2827.
[5] *Eldred et. al. v. Ashcroft, Attorney General*, 537 U.S. 186, (2003).
[6] George A. Akerlof, Kenneth J. Arrow, Timothy F. Bresnahan, James M. Buchanan, Ronald H. Coase, Linda R. Cohen, Milton Frideman, Jerry R. Green, Robert W. Hahn, Thomas W. Hazlett, C. Scott Hemphill, Robert E. Litan, Roger G. Noll, Richard Schmalensee, Steven Shavell, Harold R. Varian and Richrd J. Zeckhauser, Brief *Amici Curiae* in Support of Petitioners, 20 May 2002, *Eldred et. al. v. Ashcroft, Attorney General*, 537 U.S. 186, (2003), 6, 8, and 12.
[7] *Eldred et. al. v. Ashcroft, Attorney General*, 537 U.S. 186, (2003).
[8] *Eldred et. al. v. Ashcroft, Attorney General*, 537 U.S. 186, (2003).
[9] This calculation is based on an interest rate of seven percent (Akerlof et al, Brief *Amici Curiae*, 6).

[10] TRIPS, art. 12.
[11] Council of the European Communities, Council Directive 93/98/EEC of 29 October 1993 harmonizing the term of protection of copyright and certain related rights.
[12] European Parliament and the Council of the European Union, Directive 2006/116/EC of the European Parliament and the Council of 12 December 2006 on the term of protection of copyright and related rights.
[13] Mexico - Decreto por el que se reforma la Ley Federal del Derecho de Auto del 30 abril de 2003[Decree Amending the Federal Copyright Law of April 30, 2003], DOF 23-07-2003, art. 29.
[14] *Copyright Act*, s. 23.
[15] Canada has introduced four significant copyright bills since 2005 in an attempt to implement the WIPO Copyright Treaty (WCT) (WIPO Copyright Treaty (WCT), 20 Dec., 1996, 36 ILM 65) and WIPO Performances and Phonograms Treaty (WPPT) (WIPO Performances and Phonograms Treaty, 20 Dec., 1996, 36 ILM 76), although none of these bills was passed into law, though the current bill (Bill C-11) is likely to be passed.
[16] Bill C-60, *An Act to Amend the Copyright Act*, 1st Sess., 38th Parl., 2005 (not passed); Bill C-61, *An Act to Amend the Copyright Act*, 2nd Sess., 39th Parl., 2008 (not passed); Bill C-32, *An Act to Amend the Copyright Act* , 3rd Sess., 40th Parl., 2010 (not passed); and, Bill C-11, *An Act to Amend the Copyright Act*, 1st Sess., 41st Parl., 2011 (second reading 13 Feb., 2012).
[17] William M. Landes, and Richard A. Posner, "Indefinitely Renewable Copyright," *University of Chicago Law Review*, 70(2), (Spring, 2003), 518.
[18] The concept of perpetual IP is not entirely new, and did have some popularity in 19th century France (Machlup and Penrose, "The Patent Controversy in the Nineteenth Century," 8-9).
[19] *An Act to Amend the Patent and Trademark Laws*, Pub. L. No. 96-517, 94 Stat 3015, 2028.
[20] United States – Department of Health, Education and Welfare - Commission on New Technological Uses of Copyrighted Works (CONTU), *Final Report*, (1978), 2: http://www.eric.ed.gov/PDFS/ED160122.pdf
[21] CONTU, *Final Report*, 59.
[22] Peter S. Menell, "Tailoring Legal Protection for Computer Software," *Stanford Law Review*, 39(6), (July 1987), 1329. By comparison there are now over 274 million computers in use in the U.S. (Computer Industry Almanac, "Computers in Use Forecast by Country," (n.d.): http://www.c-i-a.com/compuseexec.htm
[23] Menell, "Tailoring Legal Protection for Computer Software," 1371
[24] TRIPS, art. 10(2).
[25] *Piracy and Counterfeiting Amendments Act of 1982*, Pub. L. No. 97-180, 96 Stat. 91; *No Electronic Theft (NET) Act 1997*, Pub L. No. 106-147, 111 Stat. 2678; *Digital Theft Deterrence and Copyright Damages Improvement Act of 1999*, Pub. L. No. 106-160, 113, Stat. 1774; and, *Prioritizing Resources and Organization for Intellectual Property (PRO-IP) Act*, 2008, Pub. L. No. 110-403, 122 Stat. 4256.
[26] See chap. 2, s. III.C.
[27] *Digital Millennium Copyright Act (DMCA), 1998*, Pub. L. No. 105-304, 112 Stat. 2860; and, 17 U.S.C. §1201.
[28] 17 U.S.C. §1201.
[29] 17 U.S.C. §1203, and 1204.
[30] 17 U.S.C. §512.
[31] Graeme Dinwoodie, "The International Intellectual Property System: Treaties, Norms, National Courts and Private Ordering," in *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era*, Daniel J. Gervais, ed., (New York: Oxford University Press, 2007), 104.
[32] Bill C-11, cl. 47.
[33] Bill C-11, cl. 47.
[34] *A Bill to Amend the Criminal Penalty Provision for Criminal Infringement of a Copyright, and for Other Purposes*, S 978, 112th Cong, 1st Sess (12 May, 2011).
[35] United States – Copyright Office, *Circular 92: Copyright Law of the United States and Related Laws Contained in Title 17 of the United States Code*, (2009), iii-x: http://www.copyright.gov/title17/circ92.pdf
[36] In Canada the change was made in 1989 (*Patent Act*, s. 44). In Europe the term was extended to 20 years in a 1991 revision to the European Patent Conventions (Convention on the Grant of European Patents (European Patent Convention), 5 Oct., 1973, revised 1991, art. 63(1)), and the United States the changes

was made in 1994 as part of a range of changes stemming from the finalization of the Uruguay Trade Round (*Uruguay Round Agreements Act*, 1994, Pub. L. No. 104-465, 108 Stat. 4809).

[37] See chap 2, s. II.C for a discussion of TRIPS; and, TRIPS, 1994, art. 33.

[38] *The Drug Price Competition and Patent Term Restoration Act (1984)*, Pub. L. No. 98-417, 98 Stat. 1584; Adam B. Jaffe and Josh Lerner, *Innovation and Its Discontents: How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It*, (Princeton, NJ: Princeton University Press, 2004), 205.

[39] Rebecca S. Eisenberg, "Comment: Costs, Norms, and Inertia: Avoiding an Anticommons for Proprietary Research Tools," in *Working within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Society*, Rochelle C. Dreyfuss, Harry First and Diane L. Zimmerman, (eds.), (Oxford: Oxford University Press, 2010), 183.

[40] Council of the European Communities, Council Regulation (EEC) No. 1768/92 of 18 June 1992 Concerning the Creation of a Supplementary Protection Certificate for Medicinal Products; and European Parliament and Council of the European Union, Regulation (EC) No. 1610/96 of the European Parliament and the Council of 23 July 1996 Concerning the Creation of a Supplementary Protection Certificate for Plant Protection Products.

[41] *Diamond v. Chakrabarty*, 447 U.S. 303 (1980).

[42] Philip Leder and Timothy A. Stewart, 1980, Transgenic Non-human Mammals. US Patent 4,736,866, filed June 22, 1984, and issued April 12, 1988.

[43] *Gottschalk v. Benson* 409 U.S. 63 (1972); and Robert M. Hunt, "You Can Patent That? Are Patents on Computer Programs and Business Methods Good for the New Economy?" *Business Review – Federal Reserve Bank of Philadelphia*, Q1, (2001), 7.

[44] R. Todd Boes, 1991, Data Processing System for Hub and Spoke Financial Services Configuration, US Patent 5,193,056, filed Mar. 11, 1991, and issued Mar. 9, 1993.

[45] Giles S. Rich, "Principles of Patentability," *George Washington Law Review*, 28(2), (1960), 393-94.

[46] *State Street Bank & Trust Co., v. Signature Financial Group, Inc*., 149 F. 3d 1368, (Fed. Cir., 1998) at 1373.

[47] The *Diamond v. Diehr* case centered on whether software could be considered wholly or part of a business process. The case contained a detailed discussion of what constituted a process and if software simply represented a mathematical algorithm (which is not patentable subject matter). The court concluded that software could be considered a process if it produced some sort of tangible, useful result; however, in reaching this decision it noted a 1896 Supreme Court Case (*Cochrane v. Deener*, 94 U.S. 780 (1876)) that defined a process as "an act, or a series of acts, preformed upon the subject-matter to be transformed and reduced to a different state or thing" (*Diamond v. Diehr*, 450 U.S. 175 (1981)).

[48] The decision that 'methods' are patentable subject matter represents a considerable increase in the scope of patentable subject matter. U.S. patent law specifically allows patents for any "new and useful *process*, machine, manufacture, or composition of matter, or any new and useful improvement thereof," (emphasis added, 35 U.S.C. §101). Note the explicit lack of method. In reaching their decision in the *State Street Bank* case the Court of Appeals argued that the 35 U.S.C. §100 definition of process included a method; however, nowhere in the decision did the Court of Appeals note the *Cochrane* definition of process used in *Diehr* (see chap. 3, s I.B. n. 52). The Court of Appeals went so far as to declare that anything is patentable subject matter so long as it is a useful, concrete, tangible thing, and specifically stated that this includes numbers (*State Street Bank*). It must also be noted that in between the *Diehr* and *State Street Bank decisions*, the decision in *In re Alappat* (*In re Alappat*, 33 F. 3d 1526, (Fed. Cir., 1994) further opened the prospective of methods patentability introduced in *Diehr* but not to the same degree as *State Street Bank*.

[49] Peri Hartman, Jeffery P. Bezos, Shel Kaphan, and Joel Spiegel, 1997, Method and system for placing a purchase order via a communications network, US Patent 5960411, filed Sept. 12, 1997, and issued Sept. 28, 1999.

[50] Keith A. Alsheimer, and Andrianne H. Fitzgerald, 1997, Building block training systems and training methods, US Patent 5,851,117, filed Apr. 23, 1997, and issued Dec. 22, 1998.

[51] Dale D. Miller, 1996, Method of Putting, US Patent 5,616,089, filed Mar. 29, 1996, and issued Apr. 1 1997.

[52] *In Re Bilski*, 545 F. 3d 943, (Fed. Cir. 2008) and *Bilski v. Kappos*, 561. U.S. ___, 130 S. Ct. 3218 (2010).

[53] *Bilski v. Kappos*, 561. U.S. ___, 130 S. Ct. 3218 (2010), at II-C-2.

[54] *Bilski v. Kappos*, 561. U.S. ___, 130 S. Ct. 3218 (2010), at II-C-1.
[55] Hall, "Business and Financial Method Patents, Innovation, and Policy," 7.
[56] European Patent Convention, 2000, art. 52 2(a) and 2(c).
[57] CIPO, *Manual of Patent Office Practice*, 1998 ed., (2010), chap. 16 Computer Implemented Inventions,: http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/rpbb-mopop-eng.pdf/$file/rpbb-mopop-eng.pdf
[58] CIPO, *Manual of Patent Office Practice*, 12.04.02 (Guidance on non-technological fields).
[59] *Amazon.com v. Canada*, para 63.
[60] *Canada v. Amazon.com, Inc*., para. 72.
[61] CIPO, *Practice Subsequent to the Amazon.com Decision*, PN2011-04, (1 Aug. 2011): http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/Pratiquesuite-PracticeSubsequent-amazon-eng.pdf/$FILE/Pratiquesuite-PracticeSubsequent-amazon-eng.pdf
[62] CIPO, *Manual of Patent Office Practice*, 17.02.01a (Higher and lower life forms).
[63] *Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 S.C.R. 45, 2002 SCC 76.
[64] Philip Leder and Timothy A. Stewart, 1985, Transgenic Animals, Canadian Patent 1341442, filed June 21, 1985, and issued Oct. 7, 2003.
[65] *Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 S.C.R. 45, 2002 SCC 76, at para 158.
[66] Philip Leder and Timothy A. Stewart, 1985, Transgenic Animals, European Patent 0169672, filed June 24, 1985, and issued May 13, 1992.
[67] European Parliament and the Council of the European Union, Directive 98/44/EC of the European Parliament and the Council of 6 July 1998 on the legal protection of biological inventions.
[68] Adam B. Jaffe, "The U.S. Patent System in Transition: Policy Innovation and the Innovation Process," *Research Policy*, 29, (2000), 532.
[69] USPTO, "U.S. Patent Activity: Calendar Years 1790 to Present."
[70] USPTO, "U.S. Patent Statistics Chart Calendar Years 1963-2010," (2011): http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm
[71] *University and Small Business Patent Procedures (Bayh-Dole) Act, 1980*, Pub. L. No. 96-517, 94 Stat. 3019.
[72] *Stevenson-Wydler Technology Innovation Act of 1980*, Pub. L. No. 96-480, 94 Stat. 2311; and, Jaffe, "The U.S. Patent System in Transition," 532.
[73] Jaffe, "The U.S. Patent System in Transition," 535.
[74] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 335.
[75] Dam, "The Economic Underpinnings of Patent Law," 270.
[76] Merges, "Commercial Success and Patent Standards," 838.
[77] Merges, "Commercial Success and Patent Standards," 806, 810.
[78] Hunt, "You Can Patent That?" 9.
[79] The best mode requirements requires inventors to disclose the best mode contemplated by the inventor of carrying out his or her invention (35 U.S.C. §112). The Canadian *Patent Act* has a similar requirement (*Patent Act*, s. 27(3)(c)).
[80] Dan L. Burke and Mark A. Lemley, "Is Patent Law Technology-Specific?" *Berkeley Technology Law Journal*, 17, (2002), 1156.
[81] James Bessen and Michael J. Meurer, *Patent Failure: How Judges, Bureaucrats and Lawyers Put Innovators at Risk*, (Princeton, NJ: Princeton University Press, 2008), 67.
[82] Wesley M. Cohen, "Patents and Appropriation: Concerns and Evidence," *Journal of Technology Transfer*, 30(1/2), (2005), 59.
[83] Jaffe and Lerner, *Innovation and Its Discontents*, 69.
[84] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 352.
[85] Richard A. Posner, "Pharmaceutical Patents – Posner," in *Uncommon Sense*, Gary S. Becker and Richard A. Posner (Chicago: University of Chicago Press, 2009), 62.
[86] Heller, *The Gridlock Economy*, 103.
[87] Wesley M. Cohen, Akira Goto, Akiya Nagata, Richard R. Nelson and John P. Walsh, "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," *Research Policy*, 31, (2002), 1356, n. 12.
[88] *Semiconductor Chip Protection Act of 1984*, Pub. L. No. 98-620, 98 Stat. 3335.

[89] Treaty on Intellectual Property in Respect of Integrated Circuits (Washington Treaty), 26 May, 1989; and, WIPO, "Washington Treaty on Intellectual Property in Respect of Integrated Circuits," (n.d.): http://www.wipo.int/treaties/en/ip/washington/
[90] TRIPS, art. 35.
[91] TRIPS, art. 38.
[92] Intel, "Moore's Law and Intel Innovation," (n.d.): http://www.intel.com/about/companyinfo/museum/exhibits/moore.htm
[93] *Feist Publications Inc. v. Rural Telephone Services Co*., 499, U.S. 340 (1991).
[94] Council of the European Communities, Directive 96/9/EC of the European Parliament and the Council of 11 March 1996 on the legal protection of databases, art. 7.
[95] WIPO, "About Geographical Indication," (n.d.): http://www.wipo.int/geo_indications/en/about.html
[96] Council of the European Communities, Council Regulation (EEC) No. 1576/89 of 29 May 1989 laying down general rules on the definition, description and presentation of spirit drinks.
[97] Council of the European Communities, Council Regulation (EEC) No. 2081/92 of 14 July 1992 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs.
[98] TRIPS, art. 22-24.
[99] USPTO, "Geographical Indications – Frequently Asked Questions," (n.d.): http://www.uspto.gov/ip/global/geographical/faq/index.jsp
[100] The Convention is known by the French acronym (Union internationale pour la Protection des Obtentions Végétale (UPOV) [International Convention for the Protection of New Varieties of Plants], 2 Dec., 1961, revised 23 Oct., 1978, 1861 UNTS 281.
[101] UPOV, 1961, art. 4(1) and 5(1).
[102] UPOV, 1961, art. 8(1).
[103] WIPO, "Frequently Asked Questions: Internet Domain Names," (n.d.), http://www.wipo.int/amc/en/center/faq/domains.html
[104] North American Free Trade Agreement (NAFTA), 17 Dec., 1992, 32 ILM, 289, (1993), art. 1707; U.S. – Singapore Free Trade Agreement, 2003, art. 16.6; and U.S. – Korea Free Trade Agreement, 2007, art. 18.7.
[105] *Vessel Hull Design Protection Act, Title V of the DMCA*, 1998.
[106] Nairobi Treaty on the Protection of the Olympic Symbol, Sept. 26, 1981, 1863 UNTS 367.
[107] Machlup and Penrose, "The Patent Controversy in the Nineteenth Century," 3-7.
[108] WIPO, "What is WIPO?" (n.d.): http://www.wipo.int/about-wipo/en/what_is_wipo.html
[109] The Paris Conventions was revised six times before 1979 (Brussels 1900, Washington 1911, The Hague 1925, London 1934, Lisbon 1958, and Stockholm 1967)
[110] The Berne Convention was revised seven times before 1979 (Paris 1896, Berlin 1908, Berne 1914, Rome 1928, Brussels 1948, Stockholm 1967, and Paris 1971).
[111] Drahos and Braithwaite, *Information Feudalism*, 65, 108-120; and, United States General Accounting Office (GAO), *Strengthening Worldwide Protection of Intellectual Property Rights*, (1987), 25 and 38: http://archive.gao.gov/d2t4/132699.pdf
[112] Daniel Gervais, "(Re)implementing the Agreement on Trade-Related Aspects of Intellectual Property Rights to Foster Innovation," *The Journal of World Intellectual Property*, 12, (2009), 348.
[113] GAO, *Strengthening Worldwide Protection of Intellectual Property Rights*, 40.
[114] Canada - United States Free Trade Agreement, 1988, art. 2004.
[115] NAFTA, 1993, chap. 17.
[116] NAFTA, art. 2019 2(b).
[117] Final Act Embodying the Results of the Uruguay Round of Multilateral Negotiations (Marrakesh Agreement), 15 Apr., 1994, 1867 UNTS 14.
[118] The dispute mechanism in the WTO agreements aims at having the suspension of obligations target the same sector if such a suspension would be effective; however, if this suspension of obligations is not practicable or effective it allows for the suspension of obligations in other sectors. The agreement does suggest that these should be from the same agreement (GATT/GATS/TRIPS) if practicable or effective, but does allow for suspension of obligations to apply to a sector covered by another agreement if this is the only way for such a suspension to be effective (Understanding on Rules and Procedures Governing the Settlement of Disputes, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, 1869 UNTS 401, art. 22(3)).

[119] TRIPS, art. 65 and 66. The transition period for least developed countries has been extended beyond the 10 year timeframe specified in TRIPS to July 1, 2013 (WTO - Council for TRIPS, "Extension of the Transition Period Under Article 66.1 for Least Developed Members," 29 Nov. 2005, WTO, http://www.wto.org/english/news_e/pres05_e/pr424_e.htm).
[120] TRIPS, art. 8(1).
[121] TRIPS, art. 10.
[122] TRIPS, art. 27(1).
[123] Drahos, *Information Feudalism*, 191.
[124] Daniel Gervais, "TRIPS and Development," in *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era*, Daniel J. Gervais, ed., (New York: Oxford University Press, 2007), 8.
[125] World Trade Organization (WTO), "Declaration on the TRIPS Agreement and Public Health," 14 Nov., 2001, http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.pdf
[126] Council for TRIPS, "Extension of the Transition Period Under Article 66.1 for Least Developed Members," 29 Nov. 2005, WTO, http://www.wto.org/english/news_e/pres05_e/pr424_e.htm
[127] WCT.
[128] WPPT.
[129] WCT, art. 5.
[130] WCT, art. 7.
[131] WCT, art. 11 and 12.
[132] For a thorough discussion of the U.S. negotiations at WIPO see Pamela Samuelson, "The U.S. Digital Agenda at WIPO," *Virginia Journal of International Law*, 37, (1996), 369-440.
[133] Dinwoodie, "The International Intellectual Property System," 84-5.
[134] WIPO, "Substantive Patent Law Harmonization," (n.d.): http://www.wipo.int/patent-law/en/harmonization.htm; and a draft of the treaty is available at: http://www.wipo.int/patent-law/en/harmonization.htm
[135] WIPO, "Draft Substantive Patent Law Treaty," (n.d.): http://www.wipo.int/patent-law/en/harmonization.htm
[136] USTR, "Anti-Counterfeiting Trade Agreement," (n.d.): http://www.ustr.gov/acta
[137] Anti-Counterfeiting Trade Agreement (ACTA), (2011), art. 6(1).
[138] ACTA. art. 23.1.
[139] ACTA, art. 24.
[140] USTR, "Outlines of the Trans-Pacific Partnership Agreement," (n.d.): http://www.ustr.gov/about-us/press-office/fact-sheets/2011/november/outlines-trans-pacific-partnership-agreement
[141] Foreign Affairs and International Trade Canada, "Canada-European Union: Comprehensive Economic and Trade Agreement (CETA) Negotiations," (2011): http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/eu-ue/can-eu.aspx?view=d
[142] Note that not all of these FTAs have entered into force. See Office of the U.S. Trade Representative (USTR), "Free Trade Agreements," (n.d.): http://www.ustr.gov/trade-agreements/free-trade-agreements generally, and specifically, Australia – U.S. Free Trade Agreement, 2004, chap. 17; Bahrain - – U.S. Free Trade Agreement, 2004, chap. 14; Chile – U.S. Free Trade Agreement, 2003, chap. 17; Columbia – U.S. Free Trade Agreement, 2006, chap. 16; Jordan – U.S. Free Trade Agreement, 2000, art. 4; Korea – U.S. Free Trade Agreement, 2007, chap. 18; Morocco – U.S. Free Trade Agreement, 2004, chap. 15; Oman – U.S. Free Trade Agreement, 2006, chap. 15; Panama – U.S. Trade Promotion Agreement, 2006, chap. 15; Peru – U.S. Free Trade Agreement, 2006, chap. 16; and, Singapore – U.S. Free Trade Agreement, 2003, chap. 16.
[143] Dominican Republic – Central American Free Trade Agreement (CAFTA-DR), 2004.
[144] Dinwoodie, "The International Intellectual Property System," 91.
[145] USTR, "Trade and Investment Framework Agreements," (n.d.): http://www.ustr.gov/trade-agreements/trade-investment-framework-agreements
[146] USPTO, "U.S. Patent Activity, Calendar Years 1790 to Present." A comparable statistic is not available for copyrights as the U.S. no longer requires registration of copyrights making the number of copyrights produced in a given year inestimable.

[147] USPTO, "Office of Intellectual Property Policy and Enforcement: NIPLECC – National IP Law Enforcement Coordination Council – Introduction," (2010): http://www.uspto.gov/ip/global/enforcement/niplecc.jsp
[148] *PRO-IP Act*, 2008.
[149] The overall effectiveness of these measures is questionable. The website received only 75,000 visitors in FY2007, and the telephone hotline only 1730 calls in 2007 (United States National Intellectual Property Law Enforcement Coordination Council (NIPLECC), *Report to the President and Congress on the Coordination of Intellectual Property Enforcement and Protection*, (2008), 22: http://2001-2009.commerce.gov/s/groups/public/@doc/@os/@opa/documents/content/prod01_005189.pdf
[150] USPTO, "Bush Administration Officials Update Congress on Intellectual Property Enforcement Efforts," (2006): http://www.uspto.gov/news/pr/2007/07-26-06ip.jsp
[151] Carlos M. Gutierrez, "Remarks at the Council on Competitiveness Awards Dinner, Washington D.C.," U.S. Department of Commerce (12 Nov., 2008): http://2001-2009.commerce.gov/NewsRoom/SecretarySpeeches/PROD01_007519
[152] Stephen E. Siwek, *Copyright Industries in the U.S. Economy: The 2003-2007 Report*, International Intellectual Property Association (IIPA), (2009), 2: http://www.iipa.com/pdf/IIPASiwekReport2003-07.pdf
[153] Business Software Alliance (BSA), *Seventh Annual BSA/IDC Global Software: 09 Piracy Study*, (2010), 9: http://portal.bsa.org/globalpiracy2009/studies/globalpiracystudy2009.pdf
[154] Recording Industry Association of America (RIAA), "Piracy: Online and on the Street," (n.d.): http://www.riaa.com/physicalpiracy.php
[155] GAO, *Intellectual Property: Observations on Efforts to Quantify the Economic Effects of Counterfeit and Pirated Goods*, (2010), 18: http://www.gao.gov/new.items/d10423.pdf
[156] Daniel Gervais, "Of Clusters and Assumptions: Innovation as Part of a Full Trips Implementation," *Fordham Law Review*, 77, (2009), 2359.
[157] WIPO, "Development Agenda for WIPO," (n.d.): http://www.wipo.int/ip-development/en/agenda/
[158] WIPO, "The 45 Recommendations under the WIPO Development Agenda," (n.d.): http://www.wipo.int/ip-development/en/agenda/recommendations.html
[159] Bill C-11, cl. 21.
[160] Bill C-11, cl. 22.
[161] *eBay Inc. v. MercExchange, LLC,*. 547 U.S. 388 (2006).
[162] Bronwyn H. Hall, "Business and Financial Method Patents, Innovation, and Policy," *NBER Working Paper*, 14868, (2009), 4: http://www.nber.org/papers/w14868
[163] *eBay Inc, v. MercExchange L.L.C*., 547 U.S. 388 (2006), at 396-397 , Kennedy J, concurring.
[164] *eBay Inc, v. MercExchange L.L.C*., 547 U.S. 388 (2006). at 397, Kennedy J, concurring.
[165] *KSR International Co. v. Teleflex Inc*., 550 U.S. 398 (2007), at 427.
[166] *Laboratory Corporation of America Holdings v. Metabolite Laboratories, Inc*., 548 U.S. 124, (2006), at 126, Breyer J, dissenting.
[167] *Bilski v. Kappos*, 561 U.S. ____, 130 S. Ct. 3218 (2010), at VI, Stevens J, concurring.
[168] *Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property Act of 2011*, S 968, 112th Cong, 1st Sess (12 May, 2011).
[169] *Stop Online Piracy Act*, HR 3261, 112th Cong, 1st Sess, (26 Oct., 2011).
[170] Jim Abrams, "U.S. Postpones Vote on Anti-Piracy Law," *The Globe and Mail*, (21 Jan. 2012): http://www.theglobeandmail.com/news/technology/tech-news/us-postpones-vote-on-anti-piracy-law/article2309233/ ; and, Jonathan Wiseman, "In Fight Over Piracy Bill, New Economy Rises Against Old," *The New York Times*, (18 Jan. 2012): http://www.nytimes.com/2012/01/19/technology/web-protests-piracy-bill-and-2-key-senators-change-course.html?pagewanted=all
[171] *Leahy-Smith America Invents Act (2011)*, Pub. L. No. 112-29, 125 Stat. 284.
[172] In 1999 Congress created a prior use defense for business methods in light of the *State Street Bank* decision with the aim of addressing fears within the business community. Because many businesses had not patented business methods that they practiced, because it was unclear that such methods were patentable, a defense to infringement was added that allowed firms commercially using a method in the U.S. at least one year prior to the effective filing date to use the method without fear of being found liable for infringement (*American Inventors Protection Act*, Pub. L. No. 106-113, 113 Stat. 1501). The *America Invents Act* expands this defense from just business methods to all kinds of patentable subject matter (*Leahy-Smith America Invents Act (2011)*, s. 5).

[173] *Leahy-Smith America Invents Act (2011)*, s. 3, 5, 6(d).
[174] Coalition for Patent Fairness, "Patent Reform Supporters," (n.d.): http://www.patentfairness.org/learn/who/supporters/
[175] Coalition for Patent Fairness, "CPF Statement on the Signing of the *America Invents Act*," (n.d.): http://www.patentfairness.org/media/press/
[176] National Small Business Association, "NSBA Cautions Lawmakers Against Patent Reform," (7 Sept. 2011): http://www.nsba.biz/content/4180.shtml ; and, American Inventors for Patent Reform, "The Role of Patents and the Need for Patent Reform," (n.d.): http://www.aminn.org/patent-issues
[177] United States – White House – Office of the Press Secretary, "President Obama Signs *America Invents Act*, Overhauling the Patent System to Stimulate Economic Growth, and Announces New Steps to Help Entrepreneurs Create Jobs," (16 Sept. 2011): http://www.whitehouse.gov/the-press-office/2011/09/16/president-obama-signs-america-invents-act-overhauling-patent-system-stim
[178] *Leahy-Smith America Invents Act (2011)*, s 15.
[179] In the case of Canada the pending copyright bill (Bill C-11) would introduce powerful anticurmvention provisions (Bill C-11, *An Act to Amend the Copyright Act*, 1st Sess, 41st Parl, 2011.) and in the U.S. the *Commercial Felony Streaming Bill* (S. 978) would make illegal streaming of video content a felony offense (Eric Engleman, "Illegal Video Streaming Elevated to Felony Under Senate Bill," *Bloomberg*, (16 Jun. 2011): http://www.bloomberg.com/news/2011-06-16/illegal-video-streaming-elevated-to-felony-under-senate-measure.html).
[180] See chap. 6, s. II for a discussion of theories of the information society.

Chapter Four - Incentives

This chapter examines the role of incentives in the production and distribution of intellectual goods. The central argument for this chapter is that the focus on pecuniary incentives to stimulate the production and distribution of intellectual goods is misplaced as there are already numerous extant incentives for the production of intellectual goods, and the primary goal of policy for the intellectual goods should be creating incentives to ensure the distribution and access to intellectual works. In an effort to critically interrogate the incentive-innovation linkage in IP and intellectual goods, it decouples the two concepts that in are typically conflated.[1] By separating incentives from innovation it permits scrutiny of the arguments on incentives. It is insufficient for policymakers to rely on the simplistic argument that the greater the (pecuniary) incentive, the greater the innovatory returns. While greater pecuniary incentives can lead to more artistic and creative behaviour, such activity is necessarily concentrated where the returns appear to be most lucrative. Instead, policymakers must rely on empirical evidence to guide innovation policy, and they must also realize that to engender innovation that will address political, social, moral and economic problems, then a broad range of incentives are required. Given the overreliance on pecuniary incentives in the IP system, substantive alternatives, which draw on a range of incentives, are of critical import for achieving a wide spectrum of innovatory outcomes.

This analysis proceeds by first examining the linkages between IP and incentives focusing on the use of incentives in justificatory theories of IP, the incentive-access paradigm that shapes much of the utilitarian and economic analyses of IP and concludes by examining the range of incentives produced by the creation of exclusionary rights to intellectual goods. The second section examines the role of the pecuniary incentive in economic analyses of IP. It begins by looking at *homo economicus*, the ideal type characterization of human beings that microeconomic analyses are premised on. It then looks at how the focus on pecuniary incentives to stimulate intellectual goods production has taken on increasing influence in both economics and judicial thought, and finally it concludes with a discussion of the dangers of an exclusive focus on intellectual property.

The final section looks at two remaining, but central, aspects of incentives approach. Human beings' natural proclivity for artistic and inventive behaviour is explored and the concluding subsection reframes the incentives problem as the need for incentives to encourage the distribution of intellectual goods not their production.

I. Incentives for Intellectual Property

Incentives are given a privileged role in IP analyses. This section examines why arguments surrounding the need for incentives are given a privileged position by proponents of IP by first examining the connection between incentives and justificatory theories of IP, then looking at the tension between incentives to produce and distribute intellectual goods and access to such goods, and finally concluding by looking at the full range of incentives and disincentives created by exclusionary IP rights.

A. Justificatory Theories of Intellectual Property and Incentives

An examination of the role that incentives play in intellectual property must begin with an examination of the justificatory theories of IP. Of the three primary justificatory theories of IP – Kantian/Hegelian, Lockean and utilitarian – incentivization discourse manifests itself most prominently in the latter where it is central, but it still plays an important role in the Lockean justification. Although the incentives are most heavily stressed in the utilitarian framework, an examination of judicial decisions demonstrates that the courts frequently blend the Lockean and utilitarian approaches.

i. Personality Based Justifications (Kant and Hegel)

One approach to justifying IP is based on the writings of Immanuel Kant and G.W.F. Hegel that views artistic creations as a manifestation of an individual's personhood and as such deserving of protection.[2] Kant explicitly condemned the illegal copying of books.[3] However, Kant's focus on the importance of speech led him to conclude that copyright should not be extended to translations and derivative works.[4] Hegel's writings on intellectual property deal with both artistic works and invention. In *Philosophy of Right* Hegel claims property is essential noting that it is required to provide individuals freedom to interact with each other through mutually consenting contracts.[5] Hegel

specifically argues that inventors and authors should retain control of their intellectual property noting, "the author of the work or inventor of the apparatus remains the owner of the general method of multiplying such products."[6]

Though powerful, personality based arguments for IP are not without critical shortcomings. Arguments that suggest property is an extension of personhood confuse one's internal will and being with one's ability to manifest such will in a physical environment.[7] Artistic works and inventions are independent of their creators.[8] Furthermore, the importance of personality as expressed through works of art and invention does not imply that their creators should be entitled to the full economic value of their work. Finally, while Kant's and Hegel's arguments are better suited to works of individual creation by independent persons, this justificatory scheme presents some problems for intellectual goods produced by a collective or under the scope of employment – is the latest Hollywood movie a manifestation of the will of its director, leading actor or the studio's CEO or primary shareholder?

Kant's and Hegel's personality based approaches to IP create what is arguably the strongest justification for such rights and for the moral (as opposed to the economic) rights in copyright in particular. This approach has a much stronger resonance in continental Europe than in Anglo-American jurisdictions.[9] Their influence is reflected in the 1957 French copyright law which designated moral rights as perpetual, inalienable and imprescriptible.[10] In the Anglo-American context their influence has been muted. Though both Britain and Canada provide moral rights for authors,[11] moral rights have almost no statutory grounds in U.S. copyright law.[12] In the *Berne Convention Implementation Act of 1988* the U.S. specifically excluded itself from the moral rights provisions in Berne,[13] and the both the NAFTA and TRIPS incorporation of the Berne text specifically omit the moral rights provisions.[14]

While Kant and Hegel's arguments on IP neither give specific impetus to incentives nor feature prominently in Anglo-American IP, they serve an important role beyond providing an alternative justificatory schema for comparison. Their celebration of the author (and the inventor) lends itself to rhetorical arguments that place central emphasis

on the role of individual creators in the development of intellectual goods and displace notions that such individuals must necessarily draw from a wealth of ideas and inspiration located in the public domain. Personality based justifications for IP extol the value of individual contribution, and this rhetorical concept of romantic ownership has been coopted by proponents of the expansionary regime even when alternative justificatory schemes are used as a technique for framing the IP debate in a way that favours rights holders.[15]

ii. The Lockean Justification

The writings of John Locke on the subject of common property in *Two Treaties of Government* have been extended to the idea of intellectual property.[16] The Lockean justification is premised on the idea that when one mixes one's own labour with something from nature, the result is the property of the individual.[17] The investment of one's labour raises the value what was once common, and therefore appropriation is the appropriate labour-desert.[18] Locke indicates that there are two important conditions that must be met to justify the taking of common property – one should not take so much as to create spoilage, and one must leave "enough and as good" for others.[19] Because intellectual goods are non-rival in consumption and not prone to rotting like agricultural products or deterioration like industrial goods, any appropriation from the intellectual commons would appear to never run afoul of the two Lockean provisos.[20]

One of the primary appeals of the Lockean approach is that the IP as a natural right argument reduces the need for empirical evidence.[21] Unlike the utilitarian approach that seeks to balance incentives and maximizing the benefit to society and therefore requires careful consideration of the optimal balance, the labour-desert argument provides a strong, natural right claim for the ownership of IP.[22] For the Lockean advocate the incentive is simply a just desert.

The extension of Locke's theory of appropriation to intellectual goods is not without some practical shortcomings. Relying only on *Two Treaties* is insufficient; Locke specifically wrote on the subject of copyright where he condemned providing copyright to ancient works and suggested that the term for copyright should be *at most* 70 years

after death of the author.[23] Even working from just Locke's writing on tangible property raises some problems. Given the cumulative nature of information one must question why an individual is entitled to the full value of the resulting creation or invention and not only the value of what was added.[24] Furthermore just because someone is entitled to the fruits of their labour this does not necessarily mean that one should be able to extract the full market value of their work through exclusionary rights.[25] Though personal liberty was paramount for Locke, natural rights justifications of ownership over non-rival intangibles appear to needlessly infringe upon personal liberty.[26]

Lockean justifications of IP have always held a degree of appeal in Anglo-American IP debates,[27] but have tended to take a secondary role to utilitarian justifications. Despite playing a secondary role, Locke's writings have continued to have an effect, particularly the notion that individuals who mix their labour with what is common deserve a fair reward. The rhetoric of a just desert is often used to supplement utilitarian arguments based on providing incentives.

iii. Utilitarian/Consequentialist Justificatory Scheme

Although the Lockean justification appears to provide a stronger justification for IP, in the United States the most common justificatory scheme used is a utilitarian argument based on incentives.[28] The utilitarian/consequentialist view of IP treats the temporary monopoly provided through IP rights as a mechanism for encouraging creative and inventive behaviour with the aim of advancing the arts and sciences and improving society as a whole. This justificatory theory is clearly present in the U.S. Constitution's article 1, section 8, clause 8 where the explicit aim of IP is "to promote science and the useful arts."[29] It has also heavily influenced U.S. Supreme Court decisions in cases involving IP.[30] Jeremy Bentham, the father of utilitarianism, viewed patents favourably arguing, "of all the methods of exciting and rewarding industry, this [patenting] is the least burdensome, and the most exactly proportioned to the merit of invention."[31] He also believed that a patent system had clear superiority over its alternatives including the use of prizes to incent innovative activity.[32]

Although proponents of the utilitarian approach emphasize maximizing the greatest good

for society, there are several different interpretations of how such this goal is accomplished ranging from quantifiable approaches such as wealth maximization or maximization of consumer welfare to more abstract conceptions including maximizing total utility or general happiness.[33] The policy goal in the utilitarian approach to IP should be to find the optimal incentive level – the minimum level of incentive required to induce the greatest amount of creative and inventive behaviour.[34] Though IP rights limit access to information, the common, yet often unchallenged assumption, is that without sufficient incentives information will be under produced.[35] Complicating the balancing act is the fact that the greater the incentive provided (the more powerful the right to exclude) there is a corresponding decrease in access to the intellectual good and a deadweight loss as the copyrighted work, patented invention or other IP protected good or service is sold above marginal cost. While the tension between incentives and access does occupy an important role, Boyle suggests, however, that balancing discourse is largely illusionary as the rhetoric employed when framing the factors to be balanced predetermines the appropriate balance.[36]

Economic analyses of law, including those of IP, adopt a utilitarian view point that focuses on maximizing the efficient use of resources (though most law and economics scholars also concede that clearly delineated, strong property rights are essential[37]). IP creates property rights that are seen as necessary for the efficient use of any valuable resource.[38] Emphasis is placed on maximizing wealth through allocative efficiency.[39] Neoclassical economic theory treats intellectual goods, which are non-rival in consumption and lack an exclusion mechanism (without IP), as a source of market failure, and remedies this market failure through the creation of a legal right to exclude.[40] Posner acknowledges that property rights on non-scarce goods such as information induce wasteful rent seeking,[41] which occurs when economic actors engage in non-productive actives, such as lobbying in order to profit. However, he argues such rights are justified as producing the incentive to invent and create in the first place, which offset the losses from rent seeking and the decreased access to intellectual goods created by IP.[42] The dominant utilitarian approach places the greatest emphasis on the role of incentives in the production of intellectual goods, and when viewed in economic terms the issue of incentivization becomes paramount.

iv. Judicial Blending of Utilitarian and Lockean Justifications

In the case of the two major Anglo-American justificatory approaches to IP, there are numerous instances where the courts have combined the incentives and labour-desert arguments. The mixing of natural rights arguments and utilitarian principles is a common feature across all systems of property.[43] In IP cases the courts acknowledge the role incentives play in encouraging innovative behaviour, but rather than focus on ensuring that the incentive provided is minimal, so as to provide the greatest benefit to society, the importance of a just or fair reward to the creator is also stressed. In one of the earliest copyright cases in Great Britain, *Millar v. Taylor* (1769), the courts stated:

> It is wise in any state, to encourage letters, and the painful researches of learned men. The easiest and most equal way of doing it, is, by securing to them the property of their own works….
>
> He who engages in a labourious work, (such, for instance, as Johnson's Dictionary,) which may employ his whole life, will do it with more spirit, if, besides his own glory, he thinks it may be a provision for his family.[44]

A view that was reflected only a few years later in decision in *Sayre v. Moore* (1785):

> We must take care to guard against two extremes equally prejudicial; the one, that men of ability, who have employed their time for the service of the community, may not be deprived of their just merits, and the reward of their ingenuity and labour; the other, that the world may not be deprived of improvements, nor the progress of the arts be retarded.[45]

The blending of natural rights and utilitarian approaches continues to be favoured by courts. Similar language is also seen in modern decisions such as the 1985 U.S. Supreme Court decision in *Harper & Row v. Nation Enterprises* in which the court declared:

> We agree with the Court of Appeals that copyright is intended to increase and not to impede the harvest of knowledge. But we believe the Second Circuit gave insufficient deference to the scheme established by the *Copyright Act* for fostering the original works that provide the seed and substance of this harvest. The rights conferred by copyright are designed to assure contributors to the store of knowledge a fair return for their labours.[46]

This mixing of utilitarian and Lockean elements was recently evinced in the 2002

Supreme Court of Canada decision in *Théberge v. Galerie d'Art du Petit Champlain* where the court not only cited *Millar v. Taylor*, but also noted:

> The *Copyright Act* is usually presented as a balance between promoting the public interest in the encouragement and dissemination of works of the arts and intellect and obtaining a just reward for the creator (or, more accurately, to prevent someone other than the creator from appropriating whatever benefits may be generated).[47]

The blending of Lockean and utilitarian approaches has been used by judges to justify IP mechanisms, including the incentive function of IP rights. Tempering the utilitarian approach with the Lockean idea of a just desert allows justices to focus on creating fair rather than optimal incentives – a considerably easier task. Judicial reasoning such as the examples cited above has a second appeal; Lockean and utilitarian analyses provide an illusion of objectivity and neutrality.[48] However, justificatory systems that provide moral arguments for the private appropriation of the intellectual commons are on their own insufficient, and any analyses of IP must go beyond moral theory and examine the social effects of exclusionary rights.[49] If exclusionary incentives are to be provided as a means to encourage the production and distribution of intellectual goods, it is necessary to then examine how such incentives are balanced against the need for access to intellectual goods. The next section examines the tension between incentives for intellectual goods production and mechanisms to ensure such goods are accessible.

B. The Incentive-Access Paradigm

One of the central aspects of intellectual property is perceived tradeoff between the creation of incentives for the production of intellectual goods and access to such goods. Incentives and access are inversely related.[50] The incentive-access paradigm suggests that as authors and inventors are given greater control over their intellectual property the incentive to create such works increases, while the access to such goods falls; conversely if broad access is provided, then the incentive to create such works is diminished. In economic terms IP allows the producers of intellectual goods to charge a price above marginal cost and recoup the cost of creating the first copy, but the imposition of a price above marginal costs imposes a deadweight loss on society.

The inherent tension between incentives and access is reflected in both major branches of IP. The limited term of IP devices is one feature designed to facilitate eventual access. In the case of copyright, fair use/dealing exceptions are the primary mechanisms through which continued access is provided, although such exceptions are (and must be)[51] limited to prevent a dulling of the incentive effect. In the case of patents access is provided by the disclosure stipulation[52] and the minimum requirements that patents be non-obvious, novel and useful.

Underneath the incentive-access paradigm a second important consideration is taking place – should authors and inventors receive the cost of creating or developing their work or its value (with the incentive being considerably stronger in the latter case).[53] In the extreme advocates who believe that the incentive should be the full market value argue:

> The fundamental premise of our copyright law is that the best way to encourage the creation of valuable works is to let authors capture the market value of those works. This means that even if we don't want to give the Dr. Seusses of the world the power to enjoin uses of uses that offend them, we do want to protect their ability to share in all the profits that their work gives rise to.[54]

Though strengthening the incentive is alluring in that it should result in greater production of intellectual goods, there exist several problems with providing authors and inventors the full social value of their work. The value of a work is influenced by several factors including the structure of the market and ability to market and distribute the work.[55] In the case of copyright the pecuniary incentive is greater for works that have larger markets. The value of an individual's artistic or inventive endeavour is not necessarily the market value of an exclusionary right, and the conflation of the two ignores the value of the contribution from the public domain.[56] Furthermore market size does not necessarily reflect the social value of a work. Inventions are only valuable when accompanied by business models that facilitate diffusion (and sales) of the product or process.[57] Popular music and films have the potential to reach massive sales volumes, while more specialized works such as Cree language children's books will never sell millions of copies; however, market size is not a proxy for the real value a work contributes to society. For works produced under contract or within the scope of

employment the individual artist or inventor often receives minor compensation in contrast to the value corporate rights holders can extract from IP. Chesbrough's informal survey of major high tech companies reveals that individual employees are offered relatively small perks (between $500 and $2500 depending on whether the patent is issued) for work leading to a patent.[58] Individual artists face a similar situation as the high level of uncertainty about achieved success in the commercial market undermines the suggestion that pecuniary incentives are central.[59] Even though some artists earn royalties, payments tend to be small except for established superstars.[60] Although the incentives argument is premised on the idea that incentives for individuals spur intellectual activity, it is disjoint from the fact that the actual monetary rewards for individuals are quite small. Proponents of greater incentives conveniently overlook that the 'full market value' incentive is not available to most Dr. Seusses of the world but their publishers. The argument that certain kinds of activity need to be encouraged[61] does not necessarily extend itself to the argument that the incentive should be the price the market will bear for a good protected by IP, particularly when such incentive is created by exclusionary rights that limit access.

Though important, the tension between incentives and access should not dominate the debate around IP to the exclusion of all other factors. Other factors that must be considered include the problem of rent seeking, transaction costs, and the cost of enforcement.[62] On its own the incentive-access paradigm cannot provide any answer as to the ideal degree of protection for IP, as the two factors tradeoff against each other.[63] Choosing to maximize either incentives or access is a normative judgment and one that should not be made without both factoring in the other dimensions of IP and looking at empirical data.

It is also important to remember that within the utilitarian approach there are other roles played by IP, though the incentive function is dominant.[64] Kitch's prospect theory of patents suggests that the incentive-access problem is overemphasized resulting in an obfuscation of the signaling function of patents.[65] He has repeatedly argued that the limiting of access is incorrectly framed as a monopoly right as IP rights do not necessarily confer market power in economic terms.[66] Thus it is important to be mindful

of the other functions of the IP system when examining incentives and access. In this regard the next section includes an analysis of the whole range incentives produced by IP. Cognizant of the incentive-access tension, it is only with a thorough examination of the multitude of behaviours incented by IP that one can critically assess the role of incentives.

C. Incentives for Various Types of Actors Involved in the Production and Distribution of Intellectual Goods

While a simplistic static analysis would suggest that IP rights create incentives for engaging in creative and industrious behaviour, the reality is much more complex with a wide variety of incentives being created for a diverse range of actors. The IP regime creates a series of incentives on top of an already existing set of motives for intellectual work. Besides the incentives to create, propriety rights also introduces a series of incentives for maximizing the benefit of such rights that includes engaging in strategic behaviour, litigation incentives and the encouragement of rent-seeking behaviour. Though the rhetoric of individual authors and inventors is often employed, IP rights create similar but distinct incentives for employers and heirs. Finally IP also introduces a series of disincentives. This section examines the full range of incentives and disincentives produced by IP.

i. Preexisting Incentives for the Creation and Distribution of Intellectual Goods

Although the IP system introduces a pecuniary incentive for intellectual work, there are already preexisting incentives for the creation and distribution of intellectual goods. Though additional pecuniary incentives do not necessarily diminish the role played by existing incentives, arguments in favour of IP must be mindful that incentives to engage in intellectual activity already exist and can be quite powerful.

Often authors and inventors make their work available because they want to be the first to market (also known as the first mover advantage). The first to market incentive is particularly strong for goods that cannot be easily copied or reverse engineered.[67] Initially entrepreneurs are often more concerned with market share than profits.[68]

Though being the first to market is typically associated with the production of inventions where manufacturers want to have their good in the marketplace before rivals to establish the market and/or brand, first to market is also a motive for publishers of creative works. Despite the lack of copyright protection for British authors in the United States in the middle of the 19th century, American publishers often paid more than British ones for advanced copies of British works so that they could be the first to publish the book in the United States.[69] Some software publishers, including Microsoft, tolerate a degree of piracy in new markets hoping that it will contribute to lock-in and that users can eventually be converted to using licensed copies.[70] Numerous empirical studies demonstrate that the first mover advantage is a superior incentive to IP.[71] For many intellectual goods, particularly those that can be branded, the desire to be first in a market provides enough incentive.

For some intellectual goods, ideological and religious motives are primary as evinced by the presence of partisan and religious publishers.[72] The Ludwig von Mises Institute provides thousands of hours of audio and video as well as thousands of free books on the Austrian School of economics and libertarian political and social theory.[73] The Jehovah's Witnesses official site, *The Watchtower*, also provides a litany of free materials.[74] Though the lack of copyright on U.S. federal materials primary purpose is to maintain an informed citizenry, it also serves a secondary role of allowing broader distribution of American ideology. While it would be foolish to suggest that ideological and religious motives are not self-interested, they reflect that pecuniary incentives are not the only stimuli for the production and distribution of intellectual goods.

Reputation and status are also important motivators for the production of intellectual goods. Both Hobbes and Smith emphasized the importance of recognition and respect for motivating human behaviour, with Smith arguing that it may be the strongest of human desires.[75] Academics publish not for the possibility being remunerated, but from an interest in increasing their status.[76] The massive volume of scholarly literature has been produced almost entirely without pecuniary motives.[77] Scholars and other aspiring authors may be so motivated in being published that they pay to do so, rather than write for any expected financial returns.[78] The prominent open access publication *Public*

Library of Science (PLoS) Biology charges authors $2,900 to have their articles published,[79] and has no shortage of articles as it also has the highest impact factor of any journal in the discipline.[80] Joseph Stiglitz recounts how he was "enthusiastic" to write a new introduction for a pirated version of one of his textbooks in China, although his publisher lacked such enthusiasm.[81] The long history of academic publishing provides an obvious case where intellectual goods are incented overwhelmingly by non-pecuniary motives.

In addition to enhancing one's reputation, intellectual goods may be produced and distributed to garner recognition.[82] While copyrighted works can improve the reputation of individuals, firms will patent to improve their reputation.[83] Small firms will patent to establish a reputation within an industry that has large established firms.[84] Reputational motives have a long history of encouraging innovation from blast furnace engineers in 19th century England to 21st century computer programmers.[85] The desire for recognition and reputation are important incentives for the production of intellectual works, and in many cases are the primary motivators for the production of such works. The range of extant non-pecuniary incentives for the production and distribution of intellectual goods undermine the argument that strong pecuniary incentives in the form of exclusionary rights are necessary.

ii. Incentives for Strategic Behaviour, Litigation and Rent Seeking

Although IP rights create incentives for creation and distribution of intellectual works, they also create a powerful set of stimuli for strategic behaviour, litigation and rent seeking. Failure to consider these incentives when analyzing IP is particularly perilous because in general the actions spawned by these incentives are less desirable. Strategic use of patents and copyrights can undermine competition, consumer choice and innovation. Litigation around such rights creates a hidden tax on artistic and inventive behaviour, and rent seeking behaviour is particularly insidious as it shifts human activity from productive endeavours to the chasing of economic rents.

The provision of exclusionary IP rights within the broader context of a competitive market encourages IP holders to use such rights strategically.[86] There are some economic

benefits to such behaviour. In a British study global trade in IP licenses was estimated to be worth £600 billion,[87] and such trade does increase the flow of knowledge. Patents are increasingly being used as mechanisms to attract venture capital which may allow entrepreneurs to bring their ideas to market more easily or strengthen a start-up's financial position ahead of an initial public offering.[88] Some firms even donate patents to non-profit organizations and then use this donation as a tax write-off.[89] While the donation of patents is admirable, it is usually motivated by a desire to diminish patent upkeep costs.[90]

However, strategic behaviour also results in several problematic outcomes. Another example of strategic use of patents is patent blocking where patents are used to block rival firms from patenting their own research.[91] Patent blocking is particularly common in the software industry where it has been fueled by low quality patents. Low quality patent examinations by the USPTO create a vicious cycle where there is increased incentive to patent increasingly marginal inventions resulting in a greater volume of patent applications that ensures further low quality examinations by overworked examiners.[92] The only disincentive for patenting peripheral inventions is the cost of application.[93] Google has specifically claimed that patent blocking impedes innovation, and notes that the best defense against patent blocking is acquiring more patents, which only exacerbates the examination workload problem at patent offices.[94] The dual threat of litigation and patent blocking fuels defensive patent aggregation[95] where companies acquire as many patents as possible to insulate themselves from competitors' threats.[96] As the number of patents proliferates the potential for infringement and litigation increase reinforcing the importance of amassing patents. Defensive patent aggregation is analogous to the Cold War doctrine of Mutually Assured Destruction, and rather than nuclear brinkmanship rights holders engage in a strategic game of litigious threat and counter threat.

The ability to litigate, though an important dimension of property rights, provides the most powerful strategic use of IP. Infringement lawsuits not only carry the potential of monetary awards for claimants, but also give claimants the power to leverage the threat of injunction for a lucrative settlement. For example in 2006 Research in Motion (RIM),

the makers of the popular BlackBerry mobile device, had to pay a settlement of $612.5 million to NTP to ensure that the production of BlackBerrys would not be halted due to patent infringement litigation.[97] In this case the threat of injunction allowed NTP to extract a settlement far in excess of the underlying value of its patented technology. To put the settlement figure in context, for the financial year ending February 2010 RIM spent $964 million on R&D;[98] thus a $612.5 million settlement represents nearly two thirds of its annual R&D budget. As noted in chapter three, structural changes in the U.S. administration of patents are a major factor in the expansionary regime. The pro-patent decisions of the CAFC encourage patent holders to litigate.[99] Ironically the danger of litigation encourages lower quality patent applications. The increased penalties for willful infringement[100] in patent cases disincentivizes companies from reading others' patents, which results in poorer assessments of prior art in patent applications.[101] The possibility that a research endeavor may result in costly litigation can disincentivize such research.[102] Strategic patenting and lower quality patents can disincentivize firms' willingness to spend on R&D, significantly undermining the purpose of patents.[103]

A particularly problematic activity incentivized by patents is the activities of patent holding companies (known benignly as non-practicing entities or pejoratively as patent trolls).[104] Patent holding companies do not manufacture the patents they have in their portfolio. Instead, these patents are used as leverage to litigate against potential infringers in the hopes of receiving damages or to threaten litigation to receive a settlement. Sectors producing complex products with sequential innovations, such as the information technology sector, are particularly vulnerable to the danger posed by patent trolls.[105] Open source software producers are also particularly susceptive to the threat of litigation. The availability of source code in open source software products invites litigation from both competitors and patent trolls.[106] Though there has been increasing concern about the problem of patent trolls, non-practicing entities are responsible for only a small percentage of litigation.[107] Depending on how broadly one defines a non-practicing entity, trolls are involved in somewhere from 7% - 12% of all patent litigation, but these cases tend to be cases where the patent(s) at issue are litigated multiple times.[108] While they make up only a small percentage of total cases, it is notable that the volume of non-practicing entity initiated lawsuits is rising rapidly with more the 2,600 cases in 2010

up fivefold from 2004.[109]

Copyright holders have also pursued litigation strategies. In the 1980s the Association of American Publishers used lawsuits to curb illegal usage of photocopiers.[110] Though the RIAA abandoned its practice of litigating against individuals in 2009, the approach was effective at increasing awareness around copyright infringement and reduced the number of individuals engaging in illegal downloads.[111] Major cases against file sharing services Napster[112] and Grokster[113] were successful in causing such services to cease facilitating unauthorized file sharing.[114] An *amici curiae* brief by Arrow, Becker, Landes (among others) in support of the claimant in the Grokster case (MGM Studios) explicitly argued that both copyright and the litigation strategy of seeking high damages against infringers was informed by neoclassical economic theory.[115] While the litigation strategy may have been effective at reducing infringement, it is important to note that the funds received were not being channeled back to artists, but instead going to fund more law suits.[116]

A further problem with litigation stems from the increasing number of courts and tribunals that have jurisdiction on IP cases. The multitude of forums available to pursue patent litigation gives rise to forum shopping.[117] The U.S. International Trade Commission's (USITC) ability to block imports of goods containing infringing products is a particularly attractive forum in comparison to district courts. Several high technology companies including Broadcom, Qualcomm and Nokia have become embroiled in USITC battles.[118] Kodak has aggressively asserted its IP rights at the USITC garnering settlements from Samsung and LG while a complaint against Apple and RIM is ongoing.[119] The USITC has seen its IP case load, known as Section 337 investigations,[120] fluctuate over the nearly 40 years it has carried out such investigations, although 2010 marked an all-time high with 58 investigations,[121] and in 2011 there have already been over 60 setting a new record.[122] The variety of venues for IP holders to assert their rights encourages strategic litigation and by extension the investment of resources in legal battles rather than productive intellectual activity.

In addition to incentivizing strategic behaviour and litigation, IP mechanisms also incentivize rent seeking activity.[123] Rent seeking is an economic concept whereby groups

or individuals seek out monopoly privileges that stem from government regulation in markets. Rent seeking is problematic because it diverts resources form productive profit maximizing endeavours and instead invests those resources in the search for rents, which results in an economic deadweight loss.[124] Rights holding organizations have spent considerable amounts lobbying for stronger IP protection with a central focus being placed on having the U.S. Congress expand the scope and duration of copyright protection.[125] At the same time Congress has historically facilitated and encouraged such behaviour by allowing copyright industries to effectively draft their own copyright legislation.[126] A primary problem of IP is that even when expansionary demands are met with legislative change, new expansionary demands emerge. Rent seeking behaviour only abates when those seeking more expansive IP laws believe the value of future lobbying exceeds the potential benefit of future changes.[127] For companies with hundreds or thousands of patents or copyrights rent-seeking may never appear as a money losing option. The clearest example of rent seeking behaviour manifests itself in *the Sonny Bono Copyright Term Extension Act* (CTEA). The act created a nugatory incentive for creators, while at the same time making future creation more difficult.[128] In *Eldred v. Ashcroft*, a case contesting the constitutionality of the CTEA, the miniscule value of the incentive provided was critiqued by a range of notable economists including five Nobel Laureates (Akerlof (2001), Arrow (1972), Buchanan (1986), Coase (1991) and Friedman (1976)) who argued that the act decreased consumer welfare and could produce anti-commons problems.[129] Despite the objection of such esteemed and diverse Nobel Laureates, the Supreme Court upheld the law noting that even if it was bad policy it was not the dominion of the courts to second guess Congress.[130]

Some quantitative measure of the amount of money spent on lobbying in the U.S. is available from the Center for Responsive Politics. Based on data reported by the Senate Office of Public Records, the Center for Responsive Politics indicates that the Intellectual Property Owners Association spent $280,000 on lobbying in 2010, and a total of nearly $4 million from 1998 to 2010.[131] It is not only advocates for stronger rights who expend money on lobbying; the Coalition for Patent Fairness, which is made up of an array of companies primarily in the computer and software industry, has spent $9.3 million on lobbying since 2006.[132] Sums spent by these two groups are dwarfed by the lobbying

expenses of the Pharmaceutical Research and Manufacturers of America. Although the group lobbies on a range of issues and not just IP, its lobbying expenses have ballooned from just over $3 million in 1998 to nearly $ 22 million in 2010, with total spending in that time span totaling $195 million.[133] The seven industry organizations that form the IIPA[134] have collectively spent over $123 million on lobbying since 1998.[135] These prodigious sums spent on K Street are monies not invested supporting artists, creators, researchers and inventors.

The importance of the incentives for strategic uses of IP, litigation and rent seeking created by exclusionary rights cannot escape scrutiny. Although these efforts do produce some benefits (such as the donation of patents) in the aggregate they encourage a range of behaviours that significantly undermine the IP system and function as a hidden tax on creative and inventive behaviour.

iii. Differing Incentives for Firms v. Individuals and Creators v. Their Heirs

Incentivization rhetoric frames itself in terms of incentives for individuals, primarily individual inventors and authors. While individual activity is central to the production of intellectual goods, a confounding factor is that a significant amount[136] of IP ends up being owned by organizations or the heirs of the originator whose incentives often differ. A consideration of the incentive effects on these actors is necessary in determining the total range of incentives produced by IP.

The rights for most commercialized or broadly distributed intellectual goods are held by firms.[137] Rhetoric around individual inventors and authors is appealing, but discordant with the law which has always centered on providing incentives to rights holding content industries.[138] Copyright analyses have tended to ignore artist issues such as moral rights and how much artists actually earn from copyright.[139] The role of moral rights as an incentive has been ignored because it appears non-economic in nature.[140] In the case of copyright the rights for works produced under the scope of employment default to the employer unless there is an agreement otherwise.[141] Thus for works produced by employees it is wrong to assume that IP rights are the primary incentive.[142]

A similar situation occurs in the case of patents. Though individuals must apply for patents, employment agreements tend to require that such right be assigned to the employer and in some cases these agreements extend to inventions produced by the employee after their employment has ended.[143] While Edison is exalted as archetypal tinkering genius for receiving over 1000 patents in a lifetime, IBM received nearly 6,000 patents in 2010 alone.[144] In the United States the *Bayh-Dole Act* has made universities particularly interested in managing their IP portfolios. In 1983 U.S. universities were issued a total of 434 patents,[145] but by FY2009, U.S. universities received 3,417 patents and a total of $2.3 billion in licensing revenue from their expanding patent portfolios.[146] Thus, while the literature on IP tends to emphasize the role of pecuniary incentives in motivating individual creators and artists, the reality is that most commercially significant IP is held by profit maximizing organizations.

Although the discourse on copyright emphasizes the incentives of authors, in cases where individuals do not transfer their copyrights to firms, the author's heirs are the ultimate owners of the copyright. TRIPS requires that copyright terms last at least fifty years after the author's death,[147] yet the incentives of heirs are rarely discussed. Lord Macaulay noted in 1841 that the additional incentive to authors created by extending copyright protection beyond the scope of their natural life is negligible.[148] Heirs are likely to act in a more self-interested manner and may be less generous than the original author.[149] There is no reason to assume that heirs are likely to be effective managers of IP rights they did not create.[150] In the case where the heirs are not themselves artists or creators they are more likely to be concerned with stringently enforcing copyright and maximizing licensing revenue.[151] Heirs also have a greater incentive to limit any derivative works criticizing the original that fall outside the scope of parody.[152] One example of heirs' restrictive management of inherited copyrights is found in the case of the Gershwin heirs who have not only hampered scholarly inquiry into Gershwin's music, but also rigidly controlled the racial make up of casts of *Porgy and Bess*.[153] Because most artists have to sign away their copyrights to rights holding organizations, arguments that a long posthumous copyright term incentivizes authors as a means for providing for their heirs are specious.[154] The pecuniary incentive used to encourage creation of works does not necessarily encourage preservation as heirs (or rights holding publishers) may choose to

forgo the expenses involved in preserving a work.[155]

Framing IP rights in terms of incentives to individual creators helps to simplify the discussion of the role of incentives, but also ignores that IP rights create incentives for more than simply those who create. By incorporating employers/publishers and heirs in the analysis of incentives one can better discern the actual incentive effects.

iv. Disincentives Produced by IP

Finally an analysis of the range of incentives created by IP would be incomplete without the inclusion of the discinentives produced. The primary disincentive that is discussed, particularly in economic and legal literature, is that IP rights disincentivize free-riding.[156] Free-riding does have some positive benefits, and the concept of free-riding itself is a rhetorical frame that depicts accessing intellectual goods in a negative light. Although IP creates an exclusion mechanism that limits free riding, free riders can help increase market share.[157] Lucasfilm, which holds the IP rights for *Star Wars*, allows fans to create their own user generated content provided that they do so for non-commercial purposes;[158] however, Lucasfilm is not the norm and several other popular cultural franchises including *Harry Potter* and *Star Trek* have been less tolerant of fan use of their IP.[159] While exclusionary rights do limit free-riding, a degree of free-riding is still tolerated and even encouraged.

There are a small handful of other disincentives created by IP. As mentioned earlier firms are disincentivized from reading each other's patents for fear that they will have to pay increased damages for willful infringement, and may even be dissuaded from engaging in R&D at all.[160] The current copyright system disincentivizes licensing of works for non-commercial uses because of the transaction costs involved.[161] In a similar vein the transactions costs involved with using orphan works can disincentivize their use.

When examined in totality the range of incentives and disincentives created by IP is not only quite broad but also complex. The simple suggestion that greater pecuniary incentives will result in greater production of intellectual goods is true, but not in all cases. Incentives to engage in intellectual activity already exist. Exclusionary rights

create a powerful set of incentives for strategic behaviour that undermine the purpose of the IP regime, and all too often analyses of IP fail to discuss how the pecuniary incentive affects actors other than individual artists and inventors. The question then arises why is the IP system focused so keenly on providing pecuniary incentives? The next section examines this question by looking at how economic (and increasingly legal) literature has constructed a simplified view of mankind and slowly diminished the discussion around non-pecuniary incentives and the perils of such an approach.

II. Economics and the Pecuniary Incentive

Economics, like all other disciplines, is not without its own strengths and weaknesses. Economists should be commended for so strongly highlighting that all choices have costs and providing numerous insights into humans' economic behavior. However, the value in this approach is diminished when the totality of human action is viewed solely in economic terms. One of the primary problems with viewing all human behaviour through an economic lens is that it has been done so by reducing *homo sapien* and all his complexities to ideal type of *homo economicus*. The next section examines the concept of *homo economicus* and discusses the limitations the concept encounters based on its evolutionary trajectory.

A. *Homo Economicus* and the Underpinning of Pecuniary Incentives

Although the IP system produces a variety of incentives for a diverse group of actors, economic analysis focusing on the pecuniary motivations of the artist and inventor can be explained by examining its microeconomic underpinnings. Self-interest lies at the origin and center of the economic conception of human behaviour. Over time the maximizing of self-interest by economic man or *homo economicus* has taken a variety of forms. Examining the evolution of *homo economicus* reveals not only the model of microeconomic human behaviour at the heart of neoclassical economics, but also the inherent limitations of such a conception of human beings.

Economic concern with the underlying motives of human behaviour can be traced to the earliest works in economics. Malthus conceived of mankind as dominated by a

propensity to procreate at an unsustainable rate.[162] Adam Smith declared that that self-interest was the primary human motive in *The Wealth of Nations*;[163] however, scholars have noted that in *The Theory of Moral Sentiments*, Smith presents a more nuanced view of human beings.[164] Though Smith placed emphasis on self-interest, it was John Stuart Mill who argued that for economics to be considered a science it had to focus exclusively on humans' desire for wealth allowing for only two other motives (an aversion to labour and a desire for luxuries).[165] Mill never used the terms 'economic man' or '*homo economicus,'* but unlike Smith who wrote about the humans of individuals in general, Mill focused specifically on the humans in the economic sphere.[166] Mill was also aware that the economic conception of mankind he presented was incomplete, and suggested that exact science of human behaviour (ethology as Mill termed it) would examine the range of motives of human activity.[167] Although controversial, the idea of a wealth maximizing individual had a powerful influence on economics. The idea resonated with other economists in the late 19th century including Leslie,[168] Bagehot,[169] and John Neville Keynes (father of the famous John Maynard Keynes),[170] while his proposal for a more holistic science of ethology went under appreciated.[171] However, in examining how Mill's idea has influenced other economists one must come to the conclusion that although Mill is the conceptual father, *homo economicus* is truly a bastard child.

Early economics was dominated by political economists (Smith, Malthus, Ricardo, Say, Bastiat among others), but in the latter half of the 19th century the center of economic thought shifted to works by a new approach in economics. Although emphasized by Marx and Engels (and earlier by Ricardo), the labour theory of value lost favour with the early marginalists (Gossen, Jevons, Walras, and Menger) who placed the concept of marginal utility at the center of economic theory. Mill's wealth maximizing economic man became a utility maximizer. Gossen was the first to suggest that the primary motive of mankind was enjoying life, and he sketched out a basic utility theory.[172] William Stanley Jevons,[173] Leon Walras,[174] and Carl Menger[175] each expanded on the utility maximizing approach pioneered by Gossen. The shift of *homo economicus* from a wealth maximizer to a utility maximizer may appear subtle; however, it represents an important shift in economic thought. Unlike a theory of humans as wealth maximizers that can be empirically tested with some ease, utility maximization is much more difficult to

scrutinize as each individual maximizes against their own unique utility function. Rather than an empirically falsifiable view of human behaviour, the utility maximizing assumption can never be falsified. Furthermore non-utility maximizing behaviour was simply discounted as irrational. The marginalist revolution in economics along with abandonment of the political economy methodology (resulting in an over-emphasizing of the economic and a diminished focus on the non-economic) paved the way for the emergence of neoclassical economics in the 20th century, with *homo economicus* still playing a central role.

The final transformation of economic man comes from the writings of the Chicago school of economics that pioneered neoclassical economic theory and included prominent economists such as Knight, von Hayek, Coase, Friedman, Becker and Posner. Knight and Friedman continued the marginalist tradition of viewing human behaviour as dominated by a utility maximizing function.[176] Knight also accentuated the importance of rationality noting that economic man is completely rational while acknowledging that *homo economicus* does not reflect the reality of human individuals.[177] In Arrow and Debreu's 1954 economic proof of a competitive equilibrium, utility maximization is assumed to be the primary economic motivation (though technology is assumed to be fixed).[178] The most complete view of the neoclassical model of *homo economicus* is presented in Becker's *The Economic Approach to Human Behavior*. According to Becker *homo economicus* maximizes utility, has a stable set of preferences, and seeks out an optimal amount of information.[179] While specific individuals may behave irrationally, in the aggregate, behaviour is rational, and self-interest is assumed to be the dominating motive.[180] Although this depiction of human beings seems absurd, even if it is confined to only economic actions (as if these could be definitively separated from non-economic interactions), the Chicago school is cognizant of the this fact. Friedman suggests that the assumptions of a theory need not correspond to reality, so long as they are sufficiently useful for making predictions.[181] The concept of *homo economicus* has survived and evolved not in spite of its simplicity but because of it. While the concept of utility maximization comes from the marginalists, the Chicago school further evolved the concept placing it at the centre of homo economicus' rational behaviour.[182] Thus, the neoclassical approach realizes that its view of economic behaviour is distorted and

simplistic, but justifies such distortion on the basis that it creates an effective model for predicting human action.

Despite Friedman's argument that the degree to which assumptions of human behaviour correspond to reality is largely irrelevant, the *homo economicus* model *is* extremely important. Given that self-interest lies at the heart of the model (a consistent theme from Smith through to Becker) it suggests that policies should reflect this skewed conception of human beings. As a result of the economic approach to human behaviour, economic literature on intellectual property has been marked by an increased propensity to view pecuniary incentives as the sole method for encouraging the production of intellectual goods.

B. The Shift in Economic Literature and Legal Thought to an Increasingly Exclusive Focus on Pecuniary Incentives

Economic literature on intellectual property and incentives has undergone a rhetorical shift. Early literature discussed the importance of non-pecuniary incentives on creation; however, more recent works focus nearly exclusively on the power of monetary incentives.[183] Taussig, writing in 1915, suggested that inventors were driven by a range of motives including both self-interest and altruism; however, he suggested the primary motive was contrivance (also known as Veblen's instinct of workmanship).[184] He also warned that the capitalist system necessitated the pecuniary incentive as it gained greater influence over individuals.[185] In a 1934 article on copyright Arnold Plant examined a range of motives for authors.[186] Schumpeter, who argued that innovation was the driver of economic growth, viewed the joy of inventing as one of several motives that drove innovation, and believed the prospect of pecuniary gain was not required to incentivize inventive activity.[187]

The role of other incentives has been increasingly downplayed in modern economic analyses of IP. Although the idea that humans respond well to pecuniary incentives is an ontological assumption, it is increasingly accepted unthinkingly with no explicit discussion of these assumptions.[188] Not only is it assumed that exclusionary rights and pecuniary profit motivate creation, it is also dogmatically believed that by increasing the

strength of the exclusionary rights there will be a greater incenting effect.[189] Some authors go even further suggesting "private producers have an incentive to invest in innovation *only* if they receive an appropriate return,"[190] and, "A patent is the way of rewarding somebody for coming up with a worthy commercial idea."[191] Problematically arguments about essentiality of pecuniary incentives ignore the empirical evidence, which suggests other incentives are far more important.[192] The increasingly sole focus on pecuniary incentives for motivating intellectual behaviour and the diminished interest in other incentives results in IP being construed as the sole policy mechanism to incent the production and dissemination of informational goods.[193]

The economic conception of intellectual property has influenced legal scholarship, and this influence is most profound in the law and economics approach, which is also (and more accurately) known as the economic analysis of law. Law and economics literature emphasizes the importance of strong property rights as mechanisms to internalize social value.[194] Property rights prevent Hardin's "tragedy of the commons."[195] The law and economics approach specifically rejects the idea that intellectual goods policy should be based on the public good nature of information, and instead emphasizes the importance of incentives.[196] While it does make sense for judges and scholars of law to incorporate some economic analyses into their arguments, the law and economics approach goes too far by making economic questions and the search for allocatively efficient law its sole focus.

Law and economics scholarship has had an influence on court decisions. There are strong links between the law and economics oriented law department at the University of Chicago and the judiciary. Two of the school's professors (Easterbrook and Posner, both law and economics scholars and writers on the subject of IP) have been judges on the U.S. Court of Appeals for the Seventh Circuit.[197] The Chief Judge on the Court of Appeals for the Ninth Circuit is Alex Kozinski who argues that the Dr. Seusses of the world should be able to extract the full market value for their intellectual property.[198] It is not only a handful of prominently placed judges that have facilitated the overly economic approach to IP. Courts have tended to adopt the view that stronger incentives are desirable without sufficiently considering the impact on access.[199] The majority

decision in *Eldred v. Ashcroft* upheld the CTEA as a "rational enactment" because of its incentive effect.[200]

The economic treatment of IP has resulted in courts becoming increasingly concerned with limiting free-riding.[201] Such an approach undermines the importance of access to intellectual goods. A narrow concentration on the economic aspects of IP is problematic because the economic theory behind such analyses is premised on an overly simple view of human nature. Though it is questionable whether *homo economicus* is well suited for use in economic papers about copyright and patents, there should be no writ of *habeas corpus* for him in the judicial system.

C. The Danger of an Exclusive Focus on Pecuniary Incentives

The increasingly singular focus on pecuniary incentives by economists and courts is perilous. Focusing on pecuniary incentives results in an over-emphasis on intellectual goods with a commercial value and a corresponding distortion of employment patterns. More importantly it ignores the role that the non-pecuniary motives play, particularly intrinsic motivations for creation. Without a consideration of these factors and how they negatively impact the incentives for engaging in artistic and creative endeavours intellectual policymakers will be unable to effectively ensure that a broad range of intellectual goods are produced and disseminated.

i. Over-incentivization of Works with a Commercial Value

An exclusive emphasis on pecuniary incentives fails to reflect the fact that different incentive structures lead to the production of different types of intellectual goods. Scholarly publishing and open source software are both successful examples of intellectual goods whose primary incentive is reputational.[202] The copyright system, however, over-emphasizes entertaining works.[203] The current copyright system does not provide enough protection for works of great creative merit and instead provides incentives for producing "second-rate, but fortuitously favored activities."[204] In a similar manner the availability of patents steers inventive activity towards those areas where profitable returns are greatest, and not necessarily to innovations that will address major

social problems.[205] The patent system also fails to incentivize basic research as protection (and by extension the incentive) is only available for practical inventions.[206] Despite the considerable suffering caused by malaria in Africa, there is little effort exerted by major pharmaceutical companies to develop vaccines or therapies.[207] The criticism of pecuniary incentives distorting research trajectories is not new. In the mid-19th century it was suggested that there would be more inventions if inventors spent less time trying to create patentable inventions and more time working on non-patentable improvements.[208] A better system for encouraging the production and distribution of intellectual goods should encourage a wide range of incentives, and not focus exclusively on pecuniary motivators.[209]

ii. Pecuniary Incentives Distort Labour Markets

The focus on pecuniary incentives is further complicated by the problem of valuing intellectual goods. IP creates a mechanism whereby its producer can capture the full social value of their work.[210] Although most individuals involved in the production of creative works and inventions forfeit the right to collect the entire social value of their work through conditions of employment or other contracts, the concept that an individual (or his or her employer) should capture the entire social value of their work is foreign to many fields. Governmental leaders, doctors and teachers all make considerable contributions to society, yet are remunerated at levels below the total social value of their work. Teachers in particular represent a field of workers who are compensated far below the social value they produce.[211] Findings from a recent study on kindergarten classes and future earnings potential suggest that a skilled teacher can raise the income of a class of 20 students by $170,000 USD per year over an average teacher. [212] Despite the enormous contribution skilled kindergarten teachers make, they are remunerated at a much lower level.[213] IP allows rights holders to capture the full social value of their creations by internalizing positive externalities; however, no such similar benefit exists for owners of real property.[214] Because of this anomaly, labour markets become distorted by overvaluing artistic and inventive work.[215] Individuals who may consider employment in socially necessary fields such as health and education may ultimately be lured toward the production of less socially valuable but more profitable artistic and inventive work.[216]

Although artistic works and inventions are important it is wasteful from an economic perspective to over-incentivize this kind of behaviour when labour by skilled individuals in other fields can create a greater amount of social value. Thus over-incentivization can result in a decrease in social value,[217] and may upset the general economic equilibrium.[218] While there is an economic argument for incentivizing socially valuable work, there is no justification for over-incentivizing intellectual activity.[219]

iii. Overjustification and the Role of Intrinsic Motivation

An exclusive focus on pecuniary rewards to incentivize creative and inventive activity ignores a substantial body of literature in the fields of psychology and education that examine humans' intrinsic motivations and the impact of rewards on task performance. The most salient finding of this body of research is that financial rewards can undermine creativity in tasks for which individuals have an intrinsic motivation.[220] This 'overjustification hypothesis' as it is known applies even when the extrinsic incentive is small, so long as there is an underlying intrinsic motivation.[221] Human beings cannot simply be instructed to be creative, and rewards can diminish creativity.[222] Diminished creativity will occur even if the payment for the activity is made in advance.[223] Studies of commissioned versus noncommissioned works of art have found that artists are more creative when their works are noncommissioned than when they are paid in advance.[224] There are specific situations where rewards can be used to enhance intrinsic motivation, but empirical evidence cautions against making categorical statements on the importance of rewards, which includes IP rights.[225] There is some recognition in economics of the limitations of outside motivators. Stiglitz argues that economic analyses need to recognize that in many cases intrinsic rewards are more powerful than extrinsic ones.[226] Over-emphasizing the pecuniary dimension of artistic and creative work devalues other aspects of creativity, ultimately undermining the purpose of such incentives.[227]

It must be noted that there is no consensus on the influence of rewards on motivation with not only hundreds of competing studies but contradictory conclusions drawn from meta-analyses.[228] Studies from the education sector have tended to focus on primary and secondary school children, but the negative influence of rewards has also been observed

to a lesser degree in college students.[229] Intrinsic motivations are not reducible to a single metric like pecuniary incentives and may also clash with each other. As a result the balancing of incentives, both intrinsic and extrinsic, is not a simple optimization problem.[230] The key point here is that an exclusive focus on pecuniary gain to stimulate creativity ignores not only the findings of a large body of scholarly research, but the concept that human beings have intrinsic motivations.

The economic approach to human behaviour is useful for examining economic activities, but is limited by the fact that for many activities it is difficult to isolate the economic dimension from the social, political and cultural ones. This is particularly true in the case of the production of intellectual goods. *Homo economicus* is an overly simple model, and one that is particularly ill-suited for modeling the behaviour of artists and inventors. Despite its limitations, it has become increasingly common for both economists and courts to reduce complex human activity into an incentivization discourse. This discourse not only has negative economic consequences, but more importantly ignores human nature. The following section examines humans' natural inclination to engage in creative and inventive behaviour, before concluding by reframing the incentives problem as one of creating incentives for distribution not production.

III. Intellectual Activity and Homo Sapiens

This section concludes the examination of incentives by focusing first on the human species' natural propensity to engage in creative and inventive behaviour and then by concluding with a reframing of the incentives problem as a question of incentives for distribution not production.

A. Humans as Naturally Inventive and Creative

The dominant utilitarian justification for IP places central emphasis on the use of incentives. Before endorsing the idea that pecuniary incentives are the best way to encourage the production of intellectual goods, it is necessary to ask whether incentives, let alone financial ones, are required at all. Numerous scholars contend that the motivation to engage in artistic and inventive activity exists without IP.[231] IP clearly

creates a set of incentives to create; however, one must question if incentivizing intellectual goods production is a problem in need of a solution.[232] Although the incentives argument is frequently used to justify their role of intellectual property in spurring creative and inventive behaviour, there is little scrutiny given to the idea that incentives are required to produce such behaviour. Several areas of intellectual endeavour have flourished without IP protection including fashion, language, jokes, magic tricks, mathematics, and culinary techniques.[233] Landes and Posner note:

> Given the emphases of the existing scholarly and popular literature concerned with intellectual property, it may come as a surprise to many readers that the economic arguments that we make for intellectual property protection are not based primarily on a belief that without legal protection the incentives to create such property would be inadequate. That belief cannot be defended confidently on the basis of current knowledge.[234]

Because the necessity of incentives question is unresolved, it is important to question why such an emphasis on incentives. Posner argues that incentivization discourse is ideologically conservative, stating:

> It is the implicit modern *liberal* conception of the average person – good, but inept, and for both reasons not very responsive to incentives, though perhaps rather plastic. The implicit conservative of the average person, in contrast, is that he is competent but bad; hence conservatives emphasize incentives and constraints.[235]

The body of literature on intrinsic motivation and the flourishing of non-IP protected categories of inventive and creative behaviour suggest that to some degree Posner's conservative view of the average person is flawed. Even if one accepts the premise that incentives for intellectual activity are required, it does not necessarily follow that the best incentives are exclusionary rights. The idea that individuals should be financially compensated for being creative is euro-centric and not a common view across mankind.[236] For many activities pecuniary incentives are inversely related to other intrinsic motivation.[237] In her examination of why writers write, Margaret Atwood notes, "writers too must eat,"[238] but she also finds that the desire for money is only a minor incentive with incentives such as revenge and attracting the attention of the opposite sex being more common.[239] Given the salience of other motives, policymakers must question

how alternative incentive structures can be mobilized to encourage the production and distribution of intellectual goods.[240] Intellectual goods policy must not lose sight of the fact that humans are naturally creative.[241]

An important stumbling block in intellectual goods policy is that human creativity is poorly understood by policymakers and legal scholars.[242] Creativity cannot be produced simply by trying, and many individuals who have had previous success in creative fields find that the harder they try to be creative the less likely they are to succeed.[243] While necessity may be the mother of invention, serendipity is the accidental father.

Economic approaches to copyright tend to view creativity as something that can be incentivized (and the IP system a whole as something that can be optimized for efficiency).[244] Optimization is a particularly problematic concept. Human creativity is highly variable and not well suited to quantitative reductionism.[245] The range of global cultures implies there is no single, optimal incentive.[246] While it is possible to optimize in cases where there is a single common metric (time, money, etc.), creative and inventive activity draws on a range of motivations including money, the desire for recognition and reputation, and intrinsic motives that do not suit this calculus.

Returning to the tension between incentive and access provides a useful starting point for reevaluating the role of incentives. Policies on intellectual goods including IP need to confront a central question - are the policy objectives to simply stimulate the production of intellectual creations or do they aim for the broader goal of encouraging the distribution and access to such creations?[247] Simply relying on IP because it is *an* incentive for artistic and inventive behaviour is insufficient; the policy goal should be to have the best incentives system to incent the most desirable activity.[248] Because humans are naturally inventive and creative, policy should focus then on maximizing the benefit of this inherent trait. The economic framing of the incentive problem is insufficient and distortionary. The proper frame for the role of incentives in intellectual goods policy must be encouraging broad distribution without impairing the complex range of incentives that exist to create. The concluding section of this chapter focuses on this problem.

B. Incentives to Create versus Incentives to Share

The explicit goal of IP as evinced in the U.S. Constitution and a long line of Anglo-American case law is progress.[249] If the sole purpose of IP was to create incentives, then IP rights should be perpetual and without limitation. The focus on incentives to create is misplaced, and more attention must be placed on the way policy can be used to create incentives to disseminate and minimize secrecy.[250] Intellectual goods policy must be mindful that the incentivization of new artistic works is not a policy problem; the low wages and poor bargaining position of artists *vis a vis* publishers reflects the fact that there is an excess supply of artistic works.[251] Focusing on incentives for distribution suggests that moral rights should be given a more prominent role. Artists have long struggled to find avenues for expression, and publishers have taken on the important and risk bearing role of facilitating such distribution. However, the increased focus on pecuniary incentives in the form of IP is upsetting important and delicate balance between incentives and access. The current focus on pecuniary incentives gives publishers of creative works too much of an incentive to control their work as they attempt to extract the maximum possible revenue the market will bear, and firms are incented to amass patents and leverage them for their strategic value. Such an approach ultimately undermines the goal of progress by limiting access, and does not reflect the actual incentives that motivate many artists and creators.

The strongest argument for the existing intellectual property system is that it does create incentives to disclose inventive findings or share creative works instead of keeping such activity secret.[252] The danger of perpetual secrecy of information is much worse than the danger posed by IP rights.[253] With respect to invention there are strong incentives for corporations to keep knowledge secret.[254] In this regard trade secrets are worse than copyrights and patents as there is no disclosure of information;[255] however, patent applications have also faced increasing criticism for failing to clearly disclose meaningful information on the subject matter being claimed.[256]

A holistic examination of the issue of incentives for intellectual goods production and distribution elucidates the fact that the economic incentive is far from the only factor. No

one can deny that authors and inventors require subsistence, but the conclusion that stronger pecuniary incentives in the form of exclusionary rights are the only or best way to encourage intellectual activity is fallacious. The primary problem is not incentives to create, but developing policy to ensure that the fruits of creation can be widely enjoyed. IP can have a role to play, but it is not the only mechanism to encourage the production and distribution of intellectual goods. Alternative systems must be given a more prominent role. The economic framing of the incentives problem suits the interest of rights holding organizations that maximize returns from human creativity and inventiveness, and reflects the increasing valorization of the self-interested single minded pursuit of profit. However, the expansionary IP regime with its seemingly ever-expanding pecuniary incentives has dynamic consequences. The diminution of access, escalating litigation and wasteful rent seeking are threatening and in some cases even impeding innovation.

Given the problems generated by an overreliance on pecuniary incentives, substantive alternatives to IP must use a broader range of incentives structures to encourage the production and distribution of intellectual goods. As demonstrated by the case of academic scholarship, reputational incentives are not only powerful, but they can be harnessed to incent activity that can produce an array of socially useful innovatory outcomes. Pecuniary incentives premised on rhetoric of the romantic author/inventor do encourage innovative activity; however, they are only one of a swath of incentives that achieve this goal. Pecuniary incentives are themselves distortionary and condition innovation in areas where authors and inventors can expect the greatest profits. However, innovation is not simply an economic phenomenon, and if governments are going to provide stimuli for innovation they should ensure that any resulting innovation can address political, social and moral problems as well as economic ones. As such policymakers must provide a broad range of incentive structures to ensure a flourishing innovation ecosystem.

However, simply providing a wide spectrum of incentives is insufficient. Innovation policy must also be theoretically informed and based on evidence. The next chapter explores the subject of innovation by examining its theoretical and economic dimensions,

and the empirical literature on IP and innovation and then concludes by discussing how alternatives to IP can spur innovation while still ensuring access.

Notes to Chapter Four:

[1] Trosow, "The Illusive Search for Justificatory Theories," 239.
[2] William Fischer, "Theories of Intellectual Property," in *New Essays in the Legal and Political Theory of Property*, Stephen R. Munzer (ed.), (Cambridge: Cambridge University Press, 2001), 171.
[3] Immanuel Kant, "Die Unrechtmässigkeit des Büchenachdrucks," in *Copyrights and Patents for Inventions*, vol. 2, R. A. Macfie (ed.), (Edinburgh: T. and T. Clark, 1883), 581-586.
[4] Kant, "Die Unrechtmässigkeit des Büchenachdrucks," 586; and, Palmer, "Are Patents and Copyrights Morally Justified?" 840-41.
[5] G. W. F. Hegel, *The Philosophy of Right*, S.W. Doyle (trans.), (Amherst, NY: Prometheus Books, 1996), § 33 and 40.
[6] Hegel, *The Philosophy of Right*, § 69.
[7] Palmer, "Are Patents and Copyrights Morally Justified?" 843.
[8] Palmer, "Are Patents and Copyrights Morally Justified?" 844.
[9] Robert M. Hurt and Robert M. Schuchman, "The Economic Rationale of Copyright," *American Economic Review*, 56(1/2), (1966), 423; Fischer, "Theories of Intellectual Property," 171.
[10] Palmer, "Are Patents and Copyrights Morally Justified?" 841.
[11] *Copyright, Designs and Patents Act of 1988* [United Kingdom], c. 48, s. 77-89; and *Copyright Act*, s. 14.1.
[12] On artists who create works of visual art are provided moral rights in U.S. copyright law (17 U.S.C. §106A).
[13] *Berne Convention Implementation Act of 1988*, Pub. L. No. 100-568, 102 Stat. 2853, s. 3(b).
[14] TRIPS, art. 9(1); NAFTA, Annex 1701.3 (2).
[15] James Boyle, *Shamans, Software and Spleens: Law and the Construction of the Information Society*, (Cambridge, MA: Harvard University Press, 1996), ix-x, and 54-58.
[16] Proponents of the Lockean approach include Lysander Spooner, Ayn Rand, Israel Kirzner, Wendy Gordon and Adam Moore (Palmer, "Are Patents and Copyrights Morally Justified?" 821-826; Adam D. Moore, *Intellectual Property and Information Control: Philosophic Foundations and Contemporary Issues*, (New Brunswick, NJ: Transaction, 2001), 6; and, Gordon, "Render Copyright unto Caesar," 78).
[17] John Locke, *Two Treaties of Government: The Second Treaties of Government*, rev. ed., (New York: New American Library, 1963), §27.
[18] Locke, *Two Treaties of Government*, §37.
[19] Locke, *Two Treaties of Government*, §31 and 33.
[20] Seana Valentine Shiffrin, "Lockean Arguments for Private Intellectual Property," in *New Essays in the Legal and Political Theory of Property*, Stephen R. Munzer (ed.), (Cambridge: Cambridge University Press, 2001), 140; Hettinger, "Justifying Intellectual Property," 45.
[21] Shiffrin, "Lockean Arguments for Private Intellectual Property," 139.
[22] Lemley, "Property, Intellectual Property, and Free Riding," 1066.
[23] John Locke, as quoted by Peter King, *The Life and Letters of John Locke with Extracts from his Journals and Common Place Books*, new ed., (London: Bell and Daldy, 1858), 208-09.
[24] Hettinger, "Justifying Intellectual Property," 37.
[25] Hettinger, "Justifying Intellectual Property," 39-40.
[26] Palmer, "Are Patents and Copyrights Morally Justified?" 830-31; Steven Horowitz, "Designing the Public Domain," *Harvard Law Review*, 112, (2009), 1492.
[27] James Madison in The Federalist Papers No. 43 notes that patents and copyrights are rights under common law, and Mossoff argues that given the historical context in which Madison wrote this should be interpreted as a Lockean conception of IP (James Madison, "Number 43: Powers Delegated to the General Government III," in T*he Federalist*, Benjamin Fletcher Wright (ed.), (Cambridge, MA: Harvard University Press, 1961), 309; and, Adam Mossoff, "Who Cares What Thomas Jefferson Thought about Patents? Reevaluating the Patent 'Privilege' in a Historical Context," *Cornell Law Review*, 92, (2007), 980-81).

[28] Hettinger, "Justifying Intellectual Property," 47; Sami J. Valkonen and Lawrence J. White, "An Economic Model for the Incentive/Access Paradigm of Copyright Propertization: An Argument in Support of the *Orphan Works Act*," *Hastings Communication and Entertainment Law Journal*, 29, (2007), 336.
[29] United States Constitution, art. 1 sec 8, cl. 8.
[30] *Graham v. John Deere Co.*, 383 U.S. 1 (1966); *Kendall v. Winsor*, 62 U.S. 322 (1858); *Fox Film Corp. v. Doyal*, 286 U.S. 207 (1935); *Feist Publications, Inc., v. Rural Telephone Service Co.*, 499 U.S. 340 (1991); *Sony Corp. of America v. Universal City Studios, Inc.*, 464 U.S. 417 (1984).
[31] Jeremy Bentham, *The Works of Jeremy Bentham*, vol. 2, John Bowring (ed.), (Edinburgh: Simpkin, Marshall and Co., 1843), 533.
[32] Jeremy Bentham, *The Works of Jeremy Bentham*, vol. 3, John Bowring (ed.), (Edinburgh: Simpkin, Marshall and Co., 1843), 71.
[33] Fischer, "Theories of Intellectual Property," 169, 177, and 192.
[34] Lemley, "Property, Intellectual Property and Free Riding," 1031; and, Carlaw et al., "Beyond the Hype," 641.
[35] Boyle, *Shamans, Software and Spleens*, 41.
[36] James Boyle, "Cruel, Mean, or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property," *Vanderbilt Law Review*, 53, (2000), 2014, 2036-37.
[37] The Coase Theorem, one of the earliest and most important aspects of law and economics scholarship places specific emphasis on the importance of strong property rights and continues to influence law and economics scholarship generally (R. H. Coase, "The Problem of Social Cost," *Journal of Law and Economics*, 3, (1960), 44).
[38] Posner, *Economic Analysis of Law*, 3-33.
[39] Posner, *Economic Analysis of Law*, 13.
[40] Trosow, "The Illusive Search for Justificatory Theories," 228.
[41] Posner, *Economic Analysis of Law*, 38.
[42] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 20-21.
[43] Boyle, *Shamans, Software and Spleens*, 51.
[44] *Millar v. Taylor* (1769), 4 Burr. 2303, 98 E.R. 201, as quoted in, *Théberge v. Galerie d'Art du Petit Champlain inc*., [2002] 2 S.C.R. 336, 2002 SCC 34, at para. 30
[45] *Sayre v. Moore* (1785), 1 East 361, 102 Eng. Rep. 139 n. 16-18 (K.B. 1785), as quoted in Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 485, n.2.
[46] *Harper & Row v. Nation Enterprises*, 471 U.S. 539 (1985), at 545-46.
[47] *Théberge v. Galerie d'Art du Petit Champlain inc*., [2002] 2 S.C.R. 336, 2002 SCC 34, at para. 30
[48] Fischer, "Theories of Intellectual Property," 194; Julie E. Cohen, "Creativity and Culture in Copyright Theory," *U.C. Davis Law Review*, 40, (2007), 1157.
[49] Gervais, "TRIPS and Development," 22.
[50] Sanford J. Grossman and Joseph E. Stiglitz, "On the Impossibility of Informationally Efficient Markets," *American Economic Review*, 70(3), (1980), 405; and, Boyle, "Cruel, Mean, or Lavish?" 2013.
[51] Both Berne and TRIPS limit exceptions by requiring they pass a three part test (Berne Convention (1979), art. 9(2), and TRIPS, art. 13).
[52] *Patent Act*, s. 27(3); and, 35 U.S.C. §112.
[53] Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 571.
[54] Alex Kozinski and Christopher Newman, "What's So Fair about Fair Use?" *Journal of the Copyright Society of the U.S.A.*, 46(4), (1999), 524.
[55] Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 572-73.
[56] Kitch, "The Nature and Function of the Patent System," 268, n. 9; and, Boyle, *Shamans, Software and Spleens*, xiv, and 132
[57] Henry W. Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology*, (Boston, MA: Harvard Business School Press, 2003), 156.
[58] Chesbrough, *Open Innovation*, 163.
[59] Rebecca Tushnet, "Economies of Desire: Fair Use and Marketplace Assumptions," *William and Mary Law Review*, 51, (2009), 518.
[60] Ruth Towse, "Copyright and Creativity: An Application of Cultural Economics," *Review of Economic Research on Copyright Issues*, 3(2), (2006), 86-87.

[61] In the case of intellectual goods one can question whether extrinsic incentives are even necessary (see chap. 4. s. II.C and s. III.A).
[62] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 11, 17-19.
[63] Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 486.
[64] Roberto Mazzoleni and Richard R. Nelson, "The Benefits and Costs of Strong Patent Protection: A Contribution to the Current Debate," *Research Policy*, 27, (1998), 275.
[65] Kitch, "The Nature and Function of the Patent System," 267-68.
[66] Kitch, "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property," 1729, and 1735; and Edmund W. Kitch, "Patents: Monopolies or Property Rights," *Research in Law and Economics*, 8, (1986), 31.
[67] Ian Hargreaves, *Digital Opportunity: A Review of Intellectual Property and Growth*, (2011), 11: http://www.ipo.gov.uk/ipreview-finalreport.pdf
[68] Jessica Litman, *Digital Copyright*, (Amherst, NY: Prometheus Books, 2001), 173
[69] Arnold Plant, "The Economic Aspects of Copyright in Books," *Economica*, 1(2), (1934), 173.
[70] Ian Hargreaves, *Digital Opportunity: A Review of Intellectual Property and Growth*, (2011), 73, n. xx: http://www.ipo.gov.uk/ipreview-finalreport.pdf
[71] See chap. 5, s. III.A.
[72] Hurt and Schuchman, "The Economic Rationale of Copyright," 426.
[73] Ludwig von Mises Institute, "About the Mises Institute," (n.d.): http://mises.org/about.aspx
[74] Watch Tower Bible and Track Society of Pennsylvania, "Publications Available," (2011): http://www.watchtower.org/e/publications/index.htm
[75] Thomas Hobbes, *Leviathan*, C. B. Macpherson, (ed.), (London: Penguin Books, 1985), 225; and, Adam Smith, *The Theory of Moral Sentiments*, Ryan Patrick Hanley (ed.), (New York: Penguin Books, 2009), 250.
[76] Seana Valentine Shiffrin, "The Incentives Argument for Intellectual Property Protection," in *Intellectual Property and Theories of Justice*, Axel Gosseries, Alain Marciano and Alain Stowel (eds.), (Houndmills, UK: Palgrave Macmillan, 2008), 96; Arnold Plant, "The Economic Aspects of Copyright in Books," *Economica*, 1(2), (1934), 169.
[77] Some academics do receive royalties on the sale of books, though scholarly publication in serials is done overwhelmingly without the prospect of payment.
[78] Plant, "The Economic Aspects of Copyright in Books," 168; and, Hurt and Schuchman, "The Economic Rationale of Copyright," 426.
[79] Public Library of Science, "About PLoS Biology," (n.d.): http://www.plosbiology.org/static/information.action
[80] ISI Web of Science, "Journal Citation Reports: Biology," Thompson Reuters, (2010): http://wokinfo.com/products_tools/analytical/jcr/ [Subscription required].
[81] Joseph Stiglitz, "Economic Foundations of Intellectual Property Rights," *Duke Law Journal*, 57, (2008), 1697-98.
[82] Hurt and Schuchman, "The Economic Rationale of Copyright," 425-26.
[83] Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1359.
[84] Wesley M. Cohen, Richard R. Nelson and John P. Walsh, "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not)," *NBER Working Paper*, 7552, (2000), 24.
[85] Dietmar Harhoff, Joachim Henkel and Eric von Hippel, "Profiting from Voluntary Information Spillovers: How Users Benefit by Freely Revealing their Innovations," *Research Policy*, 32, (2003), 1756.
[86] Ghosh, "The Fable of the Commons," 878; Brian Kahin, "Cyberinfrastructure and Innovation Policy," *First Monday*, 12(6), (2007): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1906/1788
[87] Hargreaves, *Digital Opportunity*, 12.
[88] Brian Kahin, "Patents and Diversity in Innovation," *Michigan Telecommunications Technology Law Review*, 13, (2007), 390; Shigeki Kamiyama, Jerry Sheehan and Catalina Martinez, "Valuation and the Exploitation of Intellectual Property," *OECD Science, Technology and Industry Working Papers*, 2006/5, (2006), 7, 20-21; Stuart J. H. Graham, Robert P. Merges, Pam Samuelson, and Ted Sichelman, "High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey," *Berkeley*

Technology Law Journal, 24, (2009), 1287; and Bronwyn H. Hall, "Exploring the Patent Explosion," in *Essays in Honor of Edwin Mansfield: The Economics of R&D, Innovation, and Technological Change*, Albert N. Link and F. M. Scherer (eds.), (New York: Springer, 2005), 195.

[89] Kamiyama et al., "Valuation and the Exploitation of Intellectual Property," 8.

[90] Chesbrough, *Open Innovation*, 159.

[91] Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1358.

[92] Adam B. Jaffe and Josh Lerner, "Innovation and Its Discontents," *Innovation Policy and the Economy*, 6, (2006), 36.

[93] Jaffe and Lerner, *Innovation and Its Discontents*," 176.

[94] Kent Walker, "Patents and Innovation," *The Official Google Blog*, (4 Apr. 2011): http://googleblog.blogspot.com/2011/04/patents-and-innovation.html

[95] In addition to defensive patent aggregation, offensive patent aggregation also occurs where firms actively acquire IP rights and then use the threat of litigation (and injunction) to extract lucrative licensing revenues.

[96] James Bessen and Robert M. Hunt, "An Empirical Look at Software Patents," *Federal Reserve Bank of Philadelphia Working Paper*, 03-17/R, (2004), 7.

[97] Research in Motion (RIM), "Research in Motion and NTP Sign Definitive Settlement Agreement to End Litigation,"
(3 Mar. 2006): http://press.rim.com/release.jsp?id=981 ; and, Carl Shapiro, "Injunctions, Hold-Up, and Patent Royalties," *American Law and Economics Review*, 12(2), (2010), 281.

[98] RIM, *Annual Report [Financial Year] 2010*, (2010), 18: http://www.rim.com/investors/documents/pdf/annual/2010rim_ar.pdf

[99] Jaffe and Lerner, *Innovation and Its Discontents*," 56-57.

[100] Willful infringement occurs when a party knowingly infringes on another's patent. In these cases damages may be three times the amount they would have been if such infringement was committed unknowingly (35 U.S.C. §284).

[101] Kahin, "Cyberinfrastructure and Innovation Policy."; and, Elliot Maxwell, "Open Standards, Open Source and Open Innovation: Harnessing the Benefits of Openness," *Innovations*, 1(3), (2006), 130.

[102] Jaffe, "The U.S. Patent System in Transition," 549.

[103] Bessen and Hunt, "An Empirical Look at Software Patents," 7.

[104] WIPO – Standing Committee on the Law of Patents, *Report on the International Patent System*, 75.

[105] Kahin, "Patents and Diversity in Innovation," 390; and, Heller, *The Gridlock Economy*, 59.

[106] Zittrain, "Normative Principles for Evaluating Free and Proprietary Software," 267; Katherine J. Strandburg, "Evolving Innovation Paradigms and the Global Intellectual Property Regime," *Connecticut Law Review*, 41(3), (2009), 903.

[107] Bessen and Meurer, *Patent* Failure," 3, and 17.

[108] John R. Allison, Mark A. Lemley, and Joshua Walker, "Extreme Value or Trolls on Top? The Characteristics of the Most Litigated Patents," *University of Pennsylvania Law Review*, 158(1), (2009), 32.

[109] James Bessen, Jennifer Ford and Michael J. Meurer, "The Private and Social Costs of Patent Trolls," *Boston University School of Law Working Paper*, No. 11-45, (2011), 3: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272

[110] William S. Strong, "Notes from the Carrot Patch: Copyright Incentives and Disincentives for Intellectual Innovation," *Book Research Quarterly*, 2(2), (1986), 35.

[111] Recording Industry Association of America (RIAA), "Why We Do What We Do," (2011): http://www.riaa.com/physicalpiracy.php?content_selector=piracy-online-why-we-do-what-we-do

[112] *A&M Records, Inc., v. Napster, Inc*., 239 F. 3d 1004 (2001).

[113] *Metro-Goldwyn-Mayer Studios, Inc., v. Grokster, Ltd*., 545 U.S. 913 (2005).

[114] Grokster closed as a result of the U.S. Supreme Court's ruling (Grokster, "Grokster," (n.d.): http://grokster.com/), while Napster has rebuilt itself as a legal music download service (Napster, "About Napster," (2008): http://www.napster.ca/about_napster.html).

[115] Kenneth J. Arrow, Ian Ayres, Gary Becker, William M. Landes, Steven Levitt, Douglas Lichtman, Kevin Murphy, Randal Picker, Andrew Rosenfield, and Steven Shavell, Brief of *Amici Curiae* in Support of the Petitioners. *Metro-Goldwyn-Mayer Studios, Inc., v. Grokster, Ltd*., 380 F. 3d 1154 (9th Cir., 2004).

[116] David Kravets, "File Sharing Lawsuits at a Crossroads, After 5 Years of RIAA Litigation," *Wired*, (4 Sept. 2008): http://www.wired.com/threatlevel/2008/09/proving-file-sh/
[117] WIPO – Standing Committee on the Law of Patents, *Report on the International Patent System*, 9.
[118] Heller, *The Gridlock Economy*, 103.
[119] Susan Decker, "Kodak Falls as ITC Leaves Apple, RIM Claims Unresolved," *Bloomberg*, (1 Jul. 2011): http://www.bloomberg.com/news/2011-06-30/kodak-itc-case-against-apple-rim-pushed-back-until-aug-30.html
[120] The investigations are named Section 337 investigations because of the relevant section of U.S. law (19 U.S.C. §1337)
[121] United States International Trade Commission (USITC), "Number of Section 337 Investigations Instituted by Calendar Year," (n.d.): http://www.usitc.gov/intellectual_property/documents/cy_337_institutions.pdf
[122] USITC, "Investigations under Section 337 of the *Tariff Act of 1930*: Current Statistics," (2011): http://www.usitc.gov/press_room/337_stats.htm
[123] Drahos, *A Philosophy of Intellectual Property*, 119; William J. Baumol, *The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism*, (Princeton, NJ: Princeton University Press, 2002), 24; McAleer and Oxley, "Intellectual Property and Economic Incentives," 485; Hall, "Business and Financial Method Patents, Innovation, and Policy," 13.
[124] Anne O. Krueger, "The Political Economy of the Rent-Seeking Society," *American Economic Review*, 64(3), (1974), 302.
[125] Lemley, "Property, Intellectual Property, and Free Riding," 1063.
[126] Jessica Litman, *Digital Copyright*, (Amherst, NY: Prometheus Books, 2001), 23.
[127] Boyle, "Cruel, Mean, or Lavish?" 2019; Lemley, "Property, Intellectual Property, and Free Riding," 1065.
[128] Akerlof et al., Brief *Amici Curiae* in Support of the Petitioners, 6, 8, and 11.
[129] Akerlof et al., Brief *Amici Curiae* in Support of the Petitioners, 12-13. Though a range of prominent economists participated in the *amicie curaie* brief, not all economists agreed with their analysis. Liebowitz and Margolis do agree that there is little economic value in the retroactive copyright extension; however, they argue that the extension does incentivize future creation (Stan J. Liebowitz and Stephen Margolis, "Seventeen Famous Economists Weight in on Copyright: The Role of Theory, Empirics, and Network Effects," *Harvard Journal of Law and Technology*, 18(2), (2005): 438-447).
[130] *Eldred, et al. v. Aschroft, Attorney General*, 537 U.S. 186 (2001).
[131] Center for Responsive Politics, "Intellectual Property Owners Association," (2011): http://www.opensecrets.org/lobby/clientsum.php?id=D000026633&year=2010
[132] Center for Responsive Politics, "Coalition for Patent Fairness," (2011): http://www.opensecrets.org/lobby/clientsum.php?id=D000049405&year=2010
[133] Center for Responsive Politics, "Pharmaceutical Rsrch & Mfrs of American," (2011): http://www.opensecrets.org/lobby/clientsum.php?id=D000000504&year=2010
[134] The seven industry organizations are: the Association of American Publishers, the Business Software Alliance, the Entertainment Software Association, the Independent Film and Television Alliance, the Motion Picture Association of America, the National Music Publishers' Association and the Recording Industry Association of America.
[135] Center for Responsible Government, "Lobbying Database," (2011): http://www.opensecrets.org/lobby/index.php
[136] Because of the automatic nature of copyright and the lack of a registration system, one cannot claim that the majority of IP is not held by individuals.
[137] David Vaver, "Some Agnostic Observations on Intellectual Property," *Intellectual Property Journal*, 6, (1991), 130; Mark A Lemley, "Romantic Authorship and the Rhetoric of Property," *Texas Law Review*, 75, (1997), 883.
[138] Niva Elkin-Koren, "The Privatization of Information Policy," *Ethics and Information Technology*, 2, (2000), 202; Jessica Litman, *Digital Copyright*, (Amherst, NY: Prometheus Books, 2001), 104; Diane Leenheer Zimmerman, "Authorship without Ownership: Reconsidering Incentives in a Digital Age," *DePaul Law Review*, 52, (2002), 1134.
[139] Ruth Towse, "Copyright and Artists: A View from Cultural Economics," *Journal of Economic Surveys*, 20(4), (2006), 568.

[140] Towse, "Copyright and Artists," 571.
[141] *Copyright Act*, s. 13(3); and, 17 U.S.C. §201(b).
[142] Vaver, "Some Agnostic Observations on Intellectual Property," 127.
[143] Mark A Lemley, "Romantic Authorship and the Rhetoric of Property," *Texas Law Review*, 75, (1997), 883-84.
[144] Intellectual Property Owners Association, *Top 300 Organizations Granted U.S. Patents in 2010*, (2011), 2: http://www.ipo.org/AM/Template.cfm?Section=Top_300_Patent_Owners&template=/CM/ContentDisplay.cfm&ContentID=29856
[145] Wesley M. Cohen and John P. Walsh, "Access – Or Not – In Academic Biomedical Research," in *Working within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Society*, Rochelle C. Dreyfuss, Harry First and Diane L. Zimmerman, (eds.), (Oxford: Oxford University Press, 2010), 3.
[146] Association of University Technology Managers, *AUTM U.S. Licensing Activity Survey Highlights: FY2009*, (2010), 4: http://www.autm.net/AM/Template.cfm?Section=Documents&Template=/CM/ContentDisplay.cfm&ContentID=5880
[147] TRIPS, art. 12.
[148] Thomas Macaulay, Speech to the House of Commons on Copyright (5 Feb. 1841), in *The Works of Lord Macaulay (Complete)*, vol 8, Lady Trevelyan (ed.), (London: Longmans, Green and Co., 1875), 200.
[149] Gordon, "Render Copyright unto Caesar," 86; and, Olufunmilayo B. Arewa, "Copyright on Catfish Row: Musical Borrowing, *Porgy and Bess*, and Unfair Use," *Rutgers Law Journal*, 37(2), (2006), 283.
[150] Mark A. Lemley, "Ex Ante versus Ex Post Justifications for Intellectual Property," *University of Chicago Law Review*, 71, (2004), 138.
[151] Paul K. Saint-Amour, *The Copywrights: Intellectual Property and the Literary Imagination*, (Ithica, NY: Cornell University Press, 2003), 211.
[152] Saint-Amour, *The Copywrights*, 219.
[153] Arewa, "Copyright on Catfish Row," 326-27.
[154] Macaulay, "Speech to the House of Commons on Copyright," 203; and, Fritz Machlup, *Knowledge and Knowledge Production*, (Princeton, NJ: Princeton University Press, 1980), 223.
[155] Diane Leenheer Zimmerman, "Cultural Preservation: Fear of Drowning in a Licensing Swamp," in *Working within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Society*, Rochelle C. Dreyfuss, Harry First and Diane L. Zimmerman, (eds.), (Oxford: Oxford University Press, 2010), 33, and 40.
[156] Technically one could argue that free-riding is not disincentivized but eliminated; however, individuals can still free-ride by infringing IP rights.
[157] Eric von Hippel and Georg von Krogh, "Open Source Software and the 'Private-Collective' Innovation Model: Issues for Organization Science," *Organization Science*, 14(2), (2003), 218.
[158] Lucasfilm, "Lucasfilm Ltd. Wins Major Copyright Infringement Lawsuit Against *Star Wars* Stormtrooper Pirate," (2006): http://www.lucasfilm.com/press/news/news20061011.html
[159] Debora Halbert, "Mass Culture and the Culture of the Masses: A Manifesto for User-Generated Rights," *Vanderbilt Journal of Entertainment and Technology Law*, 11, (2009), 947 n. 122.
[160] See chap 4, s I.C.ii.
[161] Niva Elkin-Koren, "What Contracts Cannot Do: The Limits of Private Ordering in Facilitating a Creative Commons," *Fordham Law Review*, 74, (2005), 380.
[162] Thomas Malthus, *An Essay on the Principle of Population*, (Oxford: Oxford University Press, 2008), 139-40.
[163] Adam Smith, *An Inquiry into the Nature and Cause of the Wealth of Nations*, (New York: Bantam Classics, 2003), 46.
[164] William D. Grampp, "Adam Smith and Economic Man," *Journal of Political Economy*, 56(4), (1948), 317; R. H. Coase, "Adam Smith's View of Man," *Journal of Law and Economics*, 19, (1976), 529.
[165] John Stuart Mill, *Essays on Some Unsettled Questions in Political Economy*, (London: University of London, 1948), 137-38; John Stuart Mill, *A System of Logic, Ratiocinative and Inductive*, 8th ed., (New York: Harper and Bros, 1882), 1092-93; John Stuart Mill, "On the Definition of Political Economy; and on

the Method of Investigation Property to It," in *Essays on Some Unsettled Questions in Political Economy*, (London: John W. Parker, 1844), 137-38.

[166] John Kells Ingram was the first to use the term "economic man" in his critique of Mill's approach (John Kells Ingram, *A History of Political Economy*, 2nd ed., (London, Adam and Charles Black, 1914), 155; and, Joseph Persky, "Retrospectives: The Ethology of Homo Economicus," *Journal of Economic Perspectives*, 9(2), (1995), 222).

[167] Mill, *A System of Logic*, 1056; Mill, "On the Definition of Political Economy," 146.

[168] Thomas Edward Cliffe Leslie, *Essays in Political Economy*, 2nd ed., (New York: Augustus M Kelly, 1969), 162.

[169] Walter Bagehot, *Economic Studies*, Richard Holt Hutton (ed.), (London: Longmans, Greens and Co., 1911), 6-7.

[170] John Neville Keynes, *The Scope and Method of Political Economy*, 4th ed., (London: Macmillan and Co., 1930), 14-15.

[171] Joseph Schumpeter, *History of Economic Analysis*, Elizabeth Boody Schumpeter (ed.), (New York: Oxford University Press, 1954) 42 and 887 n. 2.

[172] Hermann Heinrich Gossen, *The Laws of Human Relations and the Rules of Human Action Derived Therefrom*, Rudolph C. Blitz (trans.), (Cambridge, MA: MIT Press, 1983), 3 and 6.

[173] W. Stanley Jevons, *The Theory of Political Economy*, 5th ed., (New York: Augustus M. Kelly, 1965), 23.

[174] Leon Walras, *Elements of Pure Economics or The Theory of Social Wealth*, William Jaffe (trans.), (Homewood, IL: Richard D. Irwin, 1954), 37, and 204-207.

[175] Carl Menger, *Principles of Economics*, (Auburn, AB: Ludwig von Mises Institute, 2007), 94 and 131.

[176] Frank H. Knight, *On the History and Method of Economics*, (Chicago: University of Chicago Press, 1956), 127; Milton Friedman and L. J. Savage, "The Expected Utility Hypothesis and the Measurability of Utility," *The Journal of Political Economy*, 60(6), (1952), 473; and, Milton Friedman and L. J. Savage, "The Utility Analysis of Choices Involving Risk," *The Journal of Political Economy*, 56(4), (1948), 287-88.

[177] Knight, *On the History and Method of Economics*, 25-26.

[178] Kenneth J. Arrow and Gerard Debreu, "Existence of an Equilibrium for a Competitive Economy," *Econometrica*, 22(8), (1954): 265 and 270.

[179] Gary S. Becker, *The Economic Approach to Human Behavior*, (Chicago: University of Chicago Press, 1990), 14.

[180] Becker, *The Economic Approach to Human Behavior*, 154, 161, and 282.

[181] Milton Friedman, *Essays in Positive Economics*, (Chicago: University of Chicago Press, 1953), 14-15.

[182] Kenneth J. Arrow, "Rationality of Self and Others in an Economic System," *The Journal of Business*, 59(4) part 2, (1986), S390.

[183] Liebowitz and Watt, "How to Best Ensure Remuneration for Creators in the Market for Music," 539, n. 12.

[184] F. W. Taussig, *Inventors and Money Makers*, (New York: Macmillon, 1915), 11 and 50.

[185] Taussig, *Inventors and Money Makers*, 54.

[186] Plant, "The Economic Aspects of Copyright in Books," 167-195.

[187] Schumpeter, *The Theory of Economic Development*, 93-94.

[188] Strong, "Notes from the Carrot Patch," 33.

[189] Wendy J. Gordon and Robert G. Bone, "Copyright," in *Encyclopedia of Law Economics*, vol. 1, Boudewijn Bouckaert and Gerrit De Geest (eds.), (Cheltenham, UK: Edward Elgar, 2000), 195.

[190] Besen and Raskind, "An Introduction to the Law and Economics of Intellectual Property," 5 [emphasis added].

[191] "Patently Absurd?" *The Economist*, (23 Jun. 2001): http://www.economist.com/node/662374

[192] See chap. 5, s.III.A.

[193] Paul A. David, "Can 'Open Science' be Protected from the Evolving Regime of IPR Protections," *Journal of Institutional and Theoretical Economics*, 160(1), (2004), 21.

[194] Lemley, "Property, Intellectual Property, and Free Riding," 1037-38; for the seminal article in law and economics literature on the importance of strong property rights that also contains a central theorem in law and economics (the Coase Theorem) see Coase, "The Problem of Social Cost," 1-44.

[195] Lemley, "Romantic Authorship and the Rhetoric of Property," 893.

[196] Peter S. Menell, "Intellectual Property: General Theories," in *Encyclopedia of Law Economics*, vol. 1, Boudewijn Bouckaert and Gerrit De Geest (eds.), (Cheltenham, UK: Edward Elgar, 2000), 133.
[197] University of Chicago Law School, "Frank H. Easterbrook: Curriculum Vitae," (2011): http://www.law.uchicago.edu/node/514/cv ; and, University of Chicago Law School, "Richard A Posner: Curriculum Vitae," (2011): http://www.law.uchicago.edu/node/79/cv
[198] United States Courts – 9th Circuit, "Chief Judge Alex Kozinski," (2011): http://www.ce9.uscourts.gov/chief_judge_bio.html ; and, see chap. 4, s. I.B.
[199] Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 487.
[200] *Eldred v. Ashcroft*, at 16.
[201] Lemley, "Property, Intellectual Property, and Free Riding," 1039.
[202] Trosow, "The Illusive Search for Justificatory Theories," 238
[203] Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 492.
[204] John Kay, "The Economics of Intellectual Property Rights," *International Review of Law and Economics*, 13, (1993), 348.
[205] Arnold Plant, "The Economic Theory Concerning Patents for Inventions," *Economica*, 1(2), (1934), 38.
[206] Boyle, *Shamans, Software and Spleens*, 13.
[207] Adrian Hollis, "Incentive Mechanisms for Innovation," *IAPR Technical Paper Series*, TP-07005, (2007), 3: http://iapr.ca/files/iapr/iapr-tp-07005_0.pdf
[208] Plant, "The Economic Theory Concerning Patents for Inventions," 40.
[209] Zittrain, "Normative Principles for Evaluating Free and Proprietary Software," 283
[210] Ghosh, "The Fable of the Commons," 873
[211] Fisher III, *Promises to Keep*, 207.
[212] Chetty et. al. "How Does Your Kindergarten Classroom Affect Your Earnings?"
[213] For 2009 in the United States the mean annual kindergarten teachers salary was $50,380. (United States – Department of Labor – Bureau of Labor Statistics, "May 2009 National Occupational Employment Wage Estimates," (2010): http://www.bls.gov/oes/current/oes_nat.htm#25-0000).
[214] Lemley, "Property, Intellectual Property, and Free Riding," 1046.
[215] Lunney, "Reexamining Copyright's Incentives-Access Paradigm," 576.
[216] Fischer, "Theories of Intellectual Property," 182.
[217] Arthur Cecil Pigou, *The Economics of Welfare*, (New Brunswick, NJ: Transaction Publishers, 2009), 191-92, n. 1.
[218] Lemley, "Property, Intellectual Property, and Free Riding," 1064.
[219] Lemley, "Property, Intellectual Property, and Free Riding," 1057.
[220] Teresa M. Amabile, *Creativity in Context: Update to The Social Psychology of Creativity*, (Boulder, CO: Westview, 1996), 154, 169; Beth A. Hennessey and Teresa M. Amabile, "Reward, Intrinsic Motivation, and Creativity," *American Psychologist*, 53(6), (1998), 674; Edward L. Deci, Richard Koestner and Richard M. Ryan, "Extrinsic Rewards and Intrinsic Motivation in Education: Reconsidered Once Again," *Review of Educational Research*, 71, (2001), 1.
[221] Mark R. Lepper, David Greene, and Richard E. Nisbett, "Undermining Children's Intrinsic Interest with Extrinsic Reward: A Test of the 'Overjustification' Hypothesis," *Journal of Personality and Social Psychology*, 28(1), (1973), 130.
[222] Hennessey and Amabile, "Reward, Intrinsic Motivation, and Creativity," 674.
[223] Amabile, *Creativity in* Context, 171.
[224] Amabile, *Creativity in* Context, 175.
[225] Hennessey and Amabile, "Reward, Intrinsic Motivation, and Creativity," 675.
[226] Joseph E. Stiglitz, "Information and the Change in the Paradigm of Economics," *American Economist*, 48(1), (2004), 26.
[227] Gordon, "Render Copyright unto Caesar," 88.
[228] For two of the major contradictory meta-analyses see Deci et al., "Extrinsic Rewards and Intrinsic Motivation in Education," 1-29, and Judy Cameron and W. David Pierce, "Reinforcement, Reward, and Intrinsic Motivation: A Meta-Analysis," *Review of Educational Research*, 64(3), (1994), 363-423.
[229] Deci et al., "Extrinsic Rewards and Intrinsic Motivation in Education," 9-10.
[230] Horowitz, "Designing the Public Domain," 1502.

[231] McAleer and Oxley, "Intellectual Property and Economic Incentives," 485; Niva Elkin-Koren, "Tailoring Copyright to Social Production," *Theoretical Inquiries in Law*, 12, (2011): 320; Schumpeter, *The Theory of Economic Development*, 91.
[232] Scotchmer, *Innovation and Incentives*, 39.
[233] Carrier, *Innovation for the 21st Century*, 50.
[234] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 9-10.
[235] Posner, "Rational Choice, Behavioral Economics, and the Law," 1559, n. 15.
[236] Thurow, "Needed," 100.
[237] Benkler, "Coase's Penguin," 378.
[238] Margaret Atwood, *Negotiating with the Dead: A Writer on Writing*, (Cambridge: Cambridge University Press, 2002), 64.
[239] Atwood, *Negotiating with the Dead*, xx-xxii.
[240] Hettinger, "Justifying Intellectual Property," 48.
[241] Benkler, "Coase's Penguin," 424.
[242] Cohen, "Creativity and Culture in Copyright Theory," 1151.
[243] Amabile, *Creativity in Context*, 153.
[244] Cohen, "Creativity and Culture in Copyright Theory," 1152.
[245] Benkler, "Coase's Penguin," 404.
[246] Graeme B. Dinwoodie, "The International Intellectual Property Law System: New Actors, New Institutions, New Sources," *Marquette Intellectual Property Law Review*, 10(2), (2006), 206; and, Bessen and Meurer, *Patent Failure*, 12.
[247] Boyle, "Cruel, Mean, or Lavish?" 2015.
[248] David D. Friedman, *Law's Order: What Economics Has to Do with Law and Why It Matters*, (Princeton, NJ: Princeton University Press, 2000), 135.
[249] On the importance of progress in judicial decisions see chap. 4, s .I.A.iv, and for a discussion of the role of progress see chap. 6, s. I.C.
[250] Ghosh, "How to Build a Commons," 217-18.
[251] Towse, "Copyright and Artists," 579.
[252] Hall, "Business and Financial Method Patents, Innovation, and Policy," 18.
[253] Thurow, "Needed," 98.
[254] See chap. 5 s. III.a for empirical evidence that suggests firms in many cases prefer trade secrecy protection over patents.
[255] Hettinger, "Justifying Intellectual Property," 52.
[256] Besser and Muerer , *Patent Failure*, 56-62.

Chapter Five – Innovation

Writing on the subject of innovation is not a new phenomenon. Francis Bacon wrote an essay on the topic 500 years ago arguing that time was the greatest innovator.[1] The early political economists wrote on the subject of invention with its role being discussed within the first dozen pages of both *The Wealth of Nations* and *The Communist Manifesto*.[2] In the 21st century the term has become increasingly ubiquitous appearing in everything from television advertisements to corporate mission, vision and values statements, and government policy objectives.

Although the concept of innovation is not complex, the term suffers from definitional imprecision. One recent study involved interviews with over 50 business leaders, and found that no two individuals approached the concept in the same way.[3] Commonly a reductionist view of innovation is adopted that defines it as simply a new product or new process. Innovation should be treated as a far richer and nuanced concept. To be innovative a product or processes must not simply be new, but an improvement over what exists. Innovation should not just be limited to products and processes but should also include new forms of organization. The most significant innovations of Henry Ford were not the cars themselves, but the Taylorist assembly line production techniques, the $5 a day wage and eight hour work day and the in general the idea of mass production and corresponding mass consumption.[4] Attention must also be paid to the difference between the act of invention and the truly innovative step of seeing an invention through to something that diffused throughout society. Edison did not invent the incandescent light bulb, but he is the innovator who was able to push forward the development of commercial systems of incandescent lighting.[5] More importantly, innovation must not be construed only in narrow economic terms. While innovation is all too often conflated with technical advances, innovations in social relations, norms and values are more important. Although the Industrial Revolution brought many new inventions, the most important innovations were social and in particular the rise of individualism and rationalism.[6] The sub-thesis for this chapter posits that innovation is not simply the production of new goods and services. Innovation is a far broader concept and must

reflect that innovations should not simply be new but an improvement on what exists. Innovation also includes organizational structures; it is a complex process that deals with not only the production of new ideas but the diffusion of the ideas, and most importantly also includes changes to values and social norms.

Rather than adopt a specific definition of innovation, this chapter proceeds by recognizing the richness and complexity of the term, but also highlighting how it is increasingly employed in a narrow and uncritical economic sense. The empirical evidence provided in this chapter demonstrates that IP is at best a moderate incentive for innovation. Empirical research also suggests that in some cases IP fetters innovation, and encourages socially wasteful litigation. Such litigation is especially problematic because it functions as a tax on innovative activity by diverting resources away from productive innovation and towards legal battles. This chapter also provides the cases of open access scholarly publishing and open source software that demonstrate that socially valuable innovation occurs in the absence of exclusionary rights. These findings clearly evince that the maximalist approach to IP found in the expansionary regime is not the best approach to ensuring high levels of innovation. Crucially it should be noted that the reliance on IP to engender innovation is particularly problematic because it uses powerful exclusionary rights that limit access to intellectual works. The reliance on IP results in not only dampened prospects for innovation, but creates a situation where the fruits of innovation are only available to those who have the financial means to purchase or license the resulting intellectual goods and services. Given that innovation is an important policy objective (politically, socially and economically), policymakers must provide support for substantive alternatives to IP to ensure a vibrant innovation framework. Reliance on IP, which results in commodification and limits on access should not be the sole or first approach; rather, it should only be employed as a last resort where other mechanisms have failed.

This chapter begins with an examination of the theoretical models of innovation created by Schumpeter and Arrow. The second section then examines the economics of innovation looking in particular at some of the problems innovation poses for economic analysis and economic insights on the potential limitations of innovation. The third

section provides a detailed discussion of the connection between intellectual goods and innovation examining the empirical evidence on IP, the connection between artistic and creative work and innovation, potential dangers of too many IP rights and concluding with a discussion of how alternatives to IP can facilitate innovation. In the next chapter this discussion then leads into a review of the ideological aspects of innovation before concluding with an analysis of the connection between IP, innovation and theories of the information society.

I. Theoretical Approaches to Innovation

Theoretical models of innovation provide a critical starting point for the analysis of the subject. In this regard the discourse is dominated by the debate between two models, those of Joseph Schumpeter and Kenneth Arrow. Schumpeter wrote on the subject of innovation repeatedly and his work actually contains two contrasting models of innovation based on how market structure influences innovation. Arrow also addresses the relationship between market structure and innovation, yet he argues that the best approach is government financing of innovation. The important aspect of the Schumpeter-Arrow debate is not the influence of market structure, which has dominated subsequent analyses, but the array of insightful points by both authors on the subject of innovation that have been lost by a rigid focus on market structure. This section begins with a detailed examination of Schumpeter's writing on innovation examining both his earlier and later writings on the subject as they present a markedly different model of innovation. It examines Arrow's work before concluding with a discussion of the empirical literature that has arisen out of the Schumpeter-Arrow debate.

A. Schumpeter and Creative Destruction

Joseph Schumpeter is commonly viewed as the scholar who first gave the concept of innovation a central role in economic analysis, and his work continues to have a strong influence on innovation scholars.[7] Though he wrote on the subject repeatedly his work is inconsistent; however, throughout his writings there are numerous insightful claims on the role of innovation in capitalism and the motives of the entrepreneur. Schumpeter first approached the subject of innovation in his 1911[8] work *The Theory of Economic*

Development.[9] Schumpeter argues that innovation is the primary driver of economic growth noting that the classical economists overemphasized the role of savings.[10] Schumpeter's focus on examining how economic development established new equilibrium points in the economy builds on the work of Walras who first proposed the idea of general economic equilibrium.[11] Schumpeter takes a broad view of innovation noting that it came in five different forms: new products, new methods of production for existing products, new sources of supply of raw materials or other inputs, the opening of new markets, or new organizations of industry.[12] Innovations are not driven by consumer demands, but arise from producers seeking entrepreneurial profit.[13] Furthermore, innovative firms are not established players in an industry, but new entrants seeking to displace older firms.[14] The availability of credit is central for financing innovation as it allowed for means of production currently in use to be innovatively repurposed.[15]

In *The Theory of Economic Development*, Schumpeter also carefully considers the motivation of innovators. He specifically suggests that innovation is the function of entrepreneurs who are conceptually distinct from capitalists (owners of the means of production).[16] While capitalists are driven by profit, entrepreneurs are motivated by three factors: a desire for wealth, a desire for success and social standing and intrinsic motives such as, "exercising one's energy and ingenuity."[17] In assessing these various motives he specifically notes that pecuniary gain is only a necessary condition in the first of the three motives, and argues that other, non-pecuniary motives for innovation have been ignored.[18] This observation remains true today. He also states that innovators, those who execute new combinations of productive forces, are not necessarily inventors and that invention and innovation should not be conflated.[19] Schumpeter posits that innovative behaviour is not rational in the traditional economic sense, and rejects using the model of economic man to explain the action of innovators.[20] He writes, "the choice of new methods is not simply an element in the concept of rational economic action, nor a matter of course, but a distinct process that stands in need of special explanation,"[21] and adds that innovation, "presupposes aptitudes different *in kind* and not only in degree from those of mere rational economic behavior."[22] The theory of economic growth described by Schumpeter, clearly celebrates the role of innovation; however, it also carefully constructs a view of innovators distinct from *homo economicus* and the traditional

capitalist.

Although Schumpeter placed specific emphasis on the importance of innovation to growth in *The Theory of Economic Development*, in his later writing he significantly revised his conception of innovation. In *Business Cycles* (originally published in 1939), Schumpeter expands his definition of innovation as simply, "'doing things differently' in the realm of economic life,"[23] and reduces the motives for innovation to the search for profit.[24] The innovative dynamism of capitalism is still driven by producers seeking to create new products and find cost saving ways of producing existing materials.[25] In 1942's *Capitalism, Socialism and Democracy* he further alters his theory of innovation as the locus of innovation is no longer new entrants in competitive markets,[26] but established firms in monopoly positions.[27] He introduces the idea of "creative destruction" arguing that it was an essential feature of capitalism and *the* driver of innovation.[28] Schumpeter stresses that the primary benefits of innovation are in improving the quality of existing items;[29] however, he also noted that innovation is not solely positive and almost always creates unemployment.[30] Finally he also warned that capitalism's creation of new wants makes satiation a fleeting goal.[31]

Schumpeter also addresses the role played by patents. He argues that patents along with trade secrecy and long term contracts act as mechanisms that inhibit the destabilizing aspects of creative destruction and are used to secure entrepreneurial profits.[32] Though patents limit the effect of creative destruction, he explicitly posits that they are economically beneficial and do not grant monopoly power.[33] Schumpeter was also cognizant of some of the strategic behaviour engendered by IP rights, noting that in oligopolistic markets firms would buy up patents and not use them simply to encumber competitors.[34] Another observation from over 50 years ago that is perhaps more true than when it was first written.

Schumpeter again returns to the subjects of motives and the entrepreneur. He is critical of the fact that incentives are pecuniary in nature, often larger than they need be to incent the activity and highly skewed in distribution to a "minority of winners."[35] Schumpeter worries that under capitalism innovation would be reduced to routine and

entrepreneurship would be automated.[36] For Schumpeter such an evolution is dangerous to the future success of capitalism as once entrepreneurial motives become limited, the propelling force of the economy becomes undermined.[37]

There are several consistent themes throughout Schumpeter's writing on innovation, and a few marked inconsistencies. Throughout his work, Schumpeter depicts the role of the entrepreneur as central, and clearly emphasizes that the entrepreneur is not the profit-driven *homo economicus*. He also forcefully argues that technological change is not some exogenous feature of the capitalist system, but a central endogenous one. He does, however, considerably alter his opinion on what type of market structure best engenders innovation. The early Schumpeter posited that competitive markets were the source of innovation, while in later years he argues that monopolists are the primary innovators. Schumpeter's contribution to the understanding of the role of innovation is threefold. First, he is the first scholar to place technological change at the centre of economic growth. Second, though he does not have a detailed account of how innovation actually occurs, he does provide a careful and nuanced description of the innovator particularly in his earlier writing. Third, though his opinion does change, he links innovation with market structure. Most importantly though, Schumpeter's approach to innovation highlights that it is individuals (entrepreneurs), organizational forms (market structures) and a range of incentives not just IP rights (or their alternatives) that are the propelling force of innovation.

B. Arrow and the Rate and Direction of Inventive Activity

In 1962 Kenneth Arrow provided an alternative to Schumpeter's creative destruction view of innovation. Arrow's analysis begins by highlighting a central aspect of attempting to engage in innovative behavior – the undertaking of research and invention is inherently risky because it is uncertain that the allocation of time and money to inventive behavior will succeed.[38] Contra Schumpeter, Arrow posits that for both product and process innovations firms in a competitive market have a greater incentive to invent than monopolists.[39] Arrow goes further though by arguing that regardless of the type of innovation or market structure, social welfare is not maximized because the

realized social benefits of innovation always exceed firms' incentive to innovate.[40] Thus, Arrow concludes, "for the optimal allocation to invention it would be necessary for the government or some other agency not governed by profit-and-loss criteria to finance research and invention."[41] He highlights two potential problems with a government funded innovation; the difficulty in calculating the amount of resources to allocate to innovative activity,[42] and how to ensure that funds would be used efficiently, though he does argue that these problems cannot be overcome.[43] Arrow's approach unequivocally suggests that a market centric approach to innovation that relies on patents is sub-optimal as it will underallocate resources to innovation.

Arrow's essay includes several profound economic insights on the production and distribution of information. A central problem in valuing information is that the purchaser of information cannot know its value until he or she possesses it.[44] He also stresses the role of other non-pecuniary incentives in spurring research giving the example of university researchers.[45] Patents are viewed as a sub-optimal appropriation mechanism as they do not provide full appropriability and therefore their incentive effect is reduced.[46] Most importantly Arrow makes several critical comments on the distribution of information. He notes that if the transmission of information could be made costless, "then optimal allocation would obviously call for unlimited distribution of the information without cost."[47] He warns that there exist numerous difficulties in creating a market for information as the "optimal allocation [of information] calls for free distribution."[48] Finally if there are limitations on the distribution of information (such as intellectual property mechanisms) then not only will innovative activity become less efficient, but the amount of innovation will also suffer.[49]

Arrow's model of innovation is important on two levels. On one hand Arrow's analysis stands counter to older Schumpeter with the latter seeing monopolists having a superior incentive to innovation, while the former considers competitive markets are more conducive to innovation. On a broader level, Arrow provides numerous arguments against the artificial creation of information markets through government intervention. The realization of networked computing technologies which allow the transmission of information at a cost approaching zero strengthens his arguments that the optimal

solution is not a market based approach that relies on patents, but the incentivization of innovative behavior through other channels.

C. Schumpeter, Arrow and the Empirical Literature on Innovation

The Schumpeter-Arrow debate has had a powerful influence on innovation scholarship; however, both models have also been subject to a substantial degree of criticism. Even amongst Schumpeterians there are disagreements as to how to interpret his writings in *Capitalism, Socialism and Democracy* with the primary disagreement centering on whether Schumpeter meant large firms are more innovative or monopolists are more innovative.[50] He has been critiqued for not actually having a theory of innovation (instead focusing on innovation as part of a theory of economic development),[51] and for failing to account for the ability of monopoly power to be self-perpetuating.[52] Conversely Arrow's approach has been critiqued for overestimating the ability for monopolists to shield themselves from competition.[53] Both authors model innovation in the aggregate failing to account for industry level factors that strongly influence the relationship between firm size and innovativeness.[54]

Schumpeter's theory that large firms would be the sources of innovation has not been borne out by a number of empirical studies that demonstrate smaller firms tend to be more innovative.[55] Gilbert's meta-analysis of 18 studies on R&D investment, industry structure and firm size concludes that Schumpeter's theory, that large monopolists or oligopolists are more likely to engage in innovative activity, is correct in the case of small process innovations but not in other cases.[56] Arrow's belief that competitive markets are superior to monopolistic ones is also not supported by the empirical evidence that provides no evidence of a single optimal market structure for producing innovation.[57] One of the confounding factors in the Schumpeter-Arrow debate is that studies often fail to fully account for the differences between product and process innovations, drastic and non-drastic innovations, and technological opportunities and appropriability conditions within and between various industries.[58] The most robust empirical finding to emerge from the study of firm size, market structure and innovativeness is the rather unsurprising conclusion that R&D spending rises monotonically with firm size; however,

innovativeness increases at a less than proportional rate to firm size.[59]

Ultimately the empirical evidence provides no clear winner in the Schumpeter-Arrow debate. However, in one regard the debate itself is in many ways irrelevant. A concentrated focus on the relationship between market structure and innovation is not the only or even the most important argument raised by the two authors. Arrow's primary thesis was that given the particular characteristics of information, it is best treated as a public good and supplied by the government. Schumpeter's analysis of innovation raises several illuminating points including the importance of non-pecuniary motives for entrepreneurs. Finally it must be noted that neither of the two scholars place central emphasis on IP rights with Schumpeter seeing them as an overall positive force, while Arrow argues that the most economically efficient approach to information is free distribution. Rather than relying on the simplistic argument that greater levels of pecuniary incentives will encourage greater levels of innovation, policy should be theoretically informed by work of Arrow and Schumpeter that demonstrates the importance of market structure. In particular, Arrow's insight that free distribution will maximize innovative activity should be considered before further expanding IP protection. Though analyses of IP place central emphasis on the relationship between individual incentives and innovation, it is telling that the two primary economic theories of innovation recast the debate in terms of market structures and innovation treating intellectual property rights as a largely peripheral issue.

II. The Economics of Innovation

While innovation is a concept that has implications for a range of disciplines it has attracted the highest degree of attention in the field of economics. Economic thought posits that innovation is the primary source of economic growth; however, there is no unified theory of innovation within the discipline. Furthermore, innovation is a particularly difficult concept for economists because it is difficult to measure. Though economic analyses often venerate innovation, the discipline also recognizes that the rate and direction of innovation can be problematic. This section reviews the economics of innovation by examining the arguments laid out above.

A. The Economic Importance of Innovation

Interest over the causes of economic growth can be traced to the 17th century; however, an explicit focus on the role of technological change and innovation has only concerned economists for slightly more than the last half century.[60] Though Schumpeter was the first author to give innovation a paramount function in economics, his work did not have a large degree of influence on mainstream neoclassical economists mostly due to the fact that he wrote in prose and not mathematics.[61] Rather than Schumpeter, it is Robert Solow who is credited with giving primary importance to the role of technological change in economic growth. In a 1957 article Solow argued that 87.5 percent of the growth in productivity in the U.S. from 1909-1949 was attributed to technological change.[62] Since Solow's Nobel Prize winning work, innovation has continued to take on a role of increasing importance both within economics directly and more broadly in social theory.[63]

The primary connection between innovation and economic growth hinges on the relationship between innovation and productivity. Innovations, specifically process innovations, facilitate gains in productivity by allowing the production of more units of output for a constant level of inputs. Increases in productivity free up capital and labour for new economic uses, which drive economic growth. It is important to note that the economic valorization of innovation is not premised on the idea that innovation will result in increased living standards, but instead on increased wealth. However, the theory of trickle down benefits of wealth creation first developed by Smith[64] provides a theoretical link between innovation and the economic improvement of the masses. The economic significance of innovation is not without its own complications. The first section below examines the theoretical and methodological problems innovation presents for economic analyses, and the second section reviews how innovation can be economically harmful.

B. Difficulties in the Economic Analysis of Innovation

i. Theoretical Problems Posed by Innovation

Within the profession there is considerable disagreement over how to treat the phenomenon of technological change. The neoclassical approach, including Solow's work, treats innovation as an exogenous factor (like manna from the heavens),[65] while heterodox analyses (including Schumpeter's) treat innovation as endogenous and further deviate from the neoclassical model by allowing increasing returns and the assumption of monopolistic rather than competitive markets.[66] These theoretical differences prevent the discipline from developing a singular unified theory of innovation. Solow even acknowledges that logic of the production of information and knowledge may be orthogonal to the economic logic of input and outputs.[67] From a welfare perspective, IP mechanisms are a second best solution as the optimal system of knowledge production is free distribution.[68] The neoclassical approach does not have any detailed theory of entrepreneurship, and unlike Schumpeter, treats the entrepreneurs as simply another factor in production.[69] Economic policy emphasizes R&D investment and innovation in high technology sectors; however, this policy is disjunctive from the reality that most of the world's population does not have the means to make use of such technologies.[70] Despite the importance of innovation in economic growth, economic theory remains unable to unequivocally answer the central question of whether intellectual property rights increase innovation or social welfare.[71] Even WIPO acknowledges that it is difficult to determine the exact nature of the role IP plays in economic growth.[72] One of the factors confounding economic analyses of innovation is the fact that innovation is very difficult to measure.

ii. The Innovation Measurement Problem

Unlike GDP, employment, purchasing power parity, consumer confidence and a range of other economic indicators innovation is difficult to quantify.[73] Though interest in innovation measurement has increased significantly, it is still in its infancy[74] with the most advanced measurement techniques being developed by the OECD.[75] Inputs to innovation such as R&D spending or employment of engineers, researchers and scientists

are common but imprecise because they fail to focus on outputs.[76] Because of the connection between productivity and innovation some economists recommend using productivity indicators as proxies for innovation.[77] Two common measures are labour productivity growth and total factor productivity growth; however, these are not direct indicators of innovation. Patents are often seen as another proxy for innovation because they facilitate quantitative analysis,[78] but are limited because they only indicate innovative activity that results in patentable outcomes. In 2010 the European Commissioner for Research and Innovation released a report that included five indicators of innovation only one of which dealt specifically with IP (patent applications weighted by GDP).[79] Trademarks, not copyrights, are also used as a measure of innovative activity, but the OECD acknowledges that one of the primary reasons for looking at trademarks is because the information is publicly available.[80] IP forms only a small set of the possible indicators, and the OECD's recent policy document on innovation measurement contains 46 classes of indicators only 10 of which involve IP.[81] One example of the problem of determining the appropriate metrics for measuring innovation was the so called Productivity Paradox (also known as the Solow Paradox) that received a considerable degree of attention in the late 1980s and early 1990s. The paradox seemed to suggest that investments in IT failed to produce gains in productivity; however, a major problem in many of the studies was the difficulty in measuring productivity.[82] Crucially though there are a wide range of economic proxies for innovation, the most important problem is the lack of mechanisms for examining the social impacts of innovation.[83]

While economists keenly appreciate that innovation is central to economic growth, they lack a clear understanding of the exact nature of the connection. This understanding is further impaired by the fact that innovation is not necessarily economically beneficial. The next section examines how the rate and direction of innovation can be economically injurious.

C. The Rate and Direction of Innovation

i. The Rate of Innovation

Although more innovation is generally viewed positively, too rapid a rate of innovation creates several economic problems. As implied by the name, creative destruction does have destructive elements which can outweigh any resulting benefits. Net reductions in social wealth result if the cost of developing a new innovation and value of the existing assets made obsolete exceed the value of the new innovation.[84] Excessive innovation can cause equipment to be obsolete too rapidly, and Plant, writing in 1933, posited that this contributed to the Great Depression.[85] Rapid rates of change lead to uncertainty and unpredictability that undermines the ability of governments and corporations to plan effectively.[86] Achieving short term economic growth through innovation can produce dynamic effects that undermine consumer confidence and ultimately diminish the long term equilibrium point of the economy.[87] For example if the rate of new product development becomes too quick in an area, consumers may significantly delay purchases. Quick changes in labour quality requirements can unsettle labour markets causing workers to become unemployed and employers lacking qualified personnel.[88]

Excessive spending on innovation is also wasteful. There exists a level of spending on innovation where social welfare suffers as resources devoted to artistic and inventive activity could be better spent elsewhere.[89] Socially wasteful patent races occur because from the perspective of individual firms the potential windfall from winning the race justifies the expenditures, but in the aggregate, R&D outlays by the race's losers outweigh the private and social gains from any resulting innovation.[90] Problematically, because of the inherent risk in innovative activity it is only possible to determine if investments in innovation are wealth creating *ex post* not *ex ante*. If the costs of developing and introducing an innovation are greater than the expected increase in social welfare, then the innovation should be discouraged.[91] Leapfrogging innovations can prove highly disruptive as previous markets are destroyed and goods and services rendered obsolete.[92] In turn rates of innovation encourage the strategic use of intellectual property to limit potential paths of innovation as in the case of patents on the electric

car.[93] Such strategic uses of IP clearly hamper innovation. Though it is easy to venerate the benefits of rapid innovation, it is important to be mindful of the destructive elements brought by Schumpeter's perennial gale.

ii. The Direction of Innovation

In addition to the danger posed by too high a rate of innovation, spending on innovation can also be misdirected. Attempting innovation is an inherently risky endeavour as it is not clear what innovations will ultimately be successful. A notable example of misdirected spending on innovation is supersonic civilian air transportation, which resulted in billions of dollars being invested in development to only limited success. Though England and France successfully developed the Concorde plane it was abandoned in 2003, while both the Soviet 'Concordski' and U.S. Supersonic Transport (SST) projects to create a similar plane failed.[94] Though the billions invested did contribute to advances in aerospace technology, from an *ex post* perspective (and only from an *ex post* perspective) they could have been used more effectively elsewhere. Furthermore, the uncertain nature of innovation paths and market development do not ensure that superior technologies succeed in the long run.[95] Due to self-reinforcing mechanism and positive feedbacks inferior technologies can come to dominate superior ones. The more efficient rotary internal combustion engine has failed to displace the inferior reciprocating engine despite a significant investment in the technology by General Motors in the 1970s.[96] In a similar vein, JVC's open licensing of the VHS standard was critical to its success in the consumer market over Sony's Betamax, which offered superior picture quality (though VHS did offer greater tape length).[97] Although innovation tends to result in superior outputs, the uncertainty and complexity of market forces fail to ensure that the market supplies the best of what is available.

Market-directed innovation also fails to ensure that resulting innovation is the most socially beneficial. While there have been a substantial number of new technologies produced in the past several decades, since the 1970s there has been little progress on creating new areas of stable, well paid employment.[98] In the case of pharmaceuticals research has been directed away from illnesses facing the world's poor and towards

lifestyle drugs.[99] IP distorts innovation paths as existing rights holders expend money on attempting to strengthen their monopolies while competitors are forced to invent around.[100] Firms have a tendency to over-invest in R&D for product lines where there is stiff competition and systematically under-invest for products and processes where competition is weak, which ultimately leaves some fruitful technological paths underdeveloped.[101] It is important to note that the problem of misdirected innovation is not unique to the IP system as there is no way of determining if the best innovation path is chosen *ex ante*.[102] However, the IP system's intimate connection with the market ensures that the direction of innovation is shaped by the pursuit of profit and self-interest and not the common good.

Innovation plays a central role in economic growth and as such is often extolled as a key economic policy. While celebrated, the discipline has no consistent theory on innovation. It has ignored some of the crucial insights from early theorists, lacks the appropriate metrics for measuring innovation and can only rely on *ex post* analysis to judge the usefulness and value of innovation. At a minimum these considerable shortcomings should cause concern when innovation is used to justify exclusionary rights. When compounded with the limitations of IP to generate innovation, examined in the following section, the economic justification for IP is seriously imperiled.

III. Intellectual Goods and Innovation

Given the problematic nature of innovation for economics it is unsurprising that the connection between intellectual goods and innovation is poorly understood. This section examines the connection between intellectual goods and innovation and reveals that the assumed link between IP and innovation is greatly overstated. An expanding body of empirical evidence, mostly concentrated on patents, provides at best weak support for IP. The role of copyright and artistic endeavours in facilitating (or impeding) innovation is often underemphasized. The dangers of too much IP have only recently begun to attract significant attention. Finally, the increasing importance of alternatives to intellectual property demonstrates that IP is not the only, or even the best way to encourage the production and distribution of intellectual goods.

A. Empirical Evidence on Intellectual Property and Innovation

This section examines the empirical literature on IP, which is mostly concentrated on patents, in the following areas: the lack of causation between IP and innovation, the dampening of innovation through the strategic use of IP, the patent application backlog problem, the rising costs of litigation, the tenuous connection between IP and R&D, and the limitations of empirical evidence in supporting claims about innovation.

i. Lack of Correlation/Causation between IP and Innovation

The central purpose of intellectual property is to foster innovation under the dominant utilitarian framework;[103] however, an examination of the empirical literature presents an unconvincing case for IP as innovation stimulus. One of the most salient points from empirical research on the patent system is that the easy availability of patents increases patenting activity, although this does not necessarily imply an increase in innovation.[104] Most inventions are not patented evincing that IP protection is clearly not central to innovation.[105] A study of European firms covering a wide range of economic sectors revealed that only one third of product innovations and one fifth of process innovations are ever patented.[106] Several industries that have only recently been afforded intellectual property protection (such as finance and software) have histories of innovation well before being afforded intellectual property protection,[107] and entire civilizations such as China have a history of innovation without IP.[108] Literary and dramatic works have been produced throughout history without the expectation of monopoly profits.[109] Even in high technology sectors such as software and semiconductors IP protection does not appear necessary to spur innovation. Although there has been a rapid uptake in software patents in the 1994 to 1997 period, it was manufacturing firms not software companies which obtained three quarters of such patents.[110] The success of open source software demonstrates that copyright is not required to produce innovation in the field,[111] and the industry was clearly innovative before business method patents allowed the patenting of software functions.[112] The constant rate of innovation in the semiconductor industry has behaved as predicted by Moore's Law since the mid-1960s,[113] even though semiconductor topologies only received *sui generis* IP protection in the 1980s. The surge

of patenting activity in the semiconductor industry is not the result of improved innovativeness, but a shift towards an increasingly strategic use of patents as bargaining chips and as means for smaller design firms to enter the industry.[114] The necessity for *sui generis* protection for plant varieties is also suspect. Despite the relatively recent protection provided by UPOV, innovation in plant breeding has a long historical record and has played a critical role in both economics and agriculture since the Neolithic Revolution.[115]

Historical studies also fail to demonstrate a strong or convincing link between IP and innovation. For nearly half of the 19th century (1827 to 1873) the anti-patent movement in Europe had considerable support including German chancellor Otto von Bismarck.[116] Inventions displayed at 19th century World's Fairs reveal that patents influence the direction of innovative activity, but patent protection is not a prerequisite for inventiveness.[117] Lerner's examination of 177 significant shifts in patent policy across six nations over a 150 year period concluded that strengthening patent protection resulted in reduced rather than increased patent applications.[118] The strengthening of Japan's patent system in 1988 was found not to have created an additional innovative effect.[119] For a wide range of intellectual endeavours there is strong historical evidence that IP is not required to produce innovation.

A long line of surveys have demonstrated that IP mechanisms are not the preferred mechanism for appropriating the returns from innovation, which undermines the argument that exclusionary rights are a necessary incentive. Empirical analyses on the most effective appropriation mechanisms are remarkably robust continually showing that outside of the pharmaceutical and chemical industries lead-time (first mover advantage), product complexity and secrecy are the preferred stimuli for innovation.[120] There are some differences between countries. Japanese firms tend to view the incentive to innovate provided by patents comparable to other incentives (such as lead time and the benefits of complementary manufacturing and complementary sales), while American firms show a much stronger presence for trade secrecy and lead time.[121] Overall though, the finding that non-IP appropriation mechanisms are preferred has been found in a range of countries including the United States,[122] Canada,[123] the United Kingdom,[124] Spain,[125]

Germany,[126] and Japan.[127] For firms, the ease of inventing around[128] is the main reason they choose not to patent.[129] Even corporations that rely on IP often find it lacking as an appropriation mechanism. A 1997 Statistics Canada study found only 22% of firms using copyrights and 34% of firms using patents found the respective IP rights "very" or "extremely effective."[130] While the pharmaceutical sector is typically found to be the industry that benefits the most from patent protection, cross country comparisons reveal that beyond a certain threshold IP protection diminishes the innovativeness of drug companies.[131] Though there is a considerable body of empirical literature on patents it is important to be mindful that these studies tend to examine large, well established firms not new entrants who may rely on patents to gain entry into a market;[132] however, recent data from the United Kingdom demonstrates that small and medium size enterprises (SMEs) also prefer non-IP appropriation mechanisms (though for U.S. SMEs preference for patents is on par with lead-time, secrecy, complexity of design and confidentiality agreements).[133] These findings are supported by a survey of early stage biotechnology and information technology companies in the U.S., which found patents provided only a slight to moderate incentive for innovative activity.[134] The effectiveness of various appropriability mechanisms is further complicated by spillovers, which tend to serve as a disincentive to innovate, but may also be a positive incentive when products are complementary.[135] The increasing number of empirical studies on appropriability and IP demonstrate that non-IP incentives play a much more significant role in inducing innovation than IP.

The body of literature on empirical studies of non-patent IP devices is considerably smaller. The EU's first review of the *sui generis* protection for databases created in Directive 96/9/EC concluded that the mechanism, "has had no proven impact on the production of databases."[136] Several studies have examined the change in the volume of copyright registrations to see how statutory changes and legal decisions influence the volume of registered works with a particular focus on the U.S., where important incentives existed for registering copyrights until 1991.[137] However, copyright registrations are only a limited indicator of innovative activity as the Berne Convention precludes mandatory registration mechanisms.[138] Landes and Posner's examination of five statutory changes to copyright law in the U.S. revealed that only two changes, the

1976 *Copyright Act* and the 1988 *Berne Convention Implementation Act*, had a significant impact on the number of copyright registrations with the former actually producing a decrease in registrations.[139] An analysis of the CTEA determined that it did not provide any incentives for the creation of new movies in the U.S.[140] However, a larger study of movie production in 26 OECD countries covering 1991-2002, a time when 19 of the 26 countries extended copyright terms, found that term extensions were associated with a statistically significant increase in movie production.[141] A study of changes to U.S. and Canadian copyright laws found that copyright registrations were significantly affected by the cost of registration, but found no compelling evidence that statutory changes had such an effect.[142] The authors conclude by positing that a low cost registration is the best mechanism to encourage creative innovation.[143] The most significant empirical examination of copyright is the 2009 study by Ku, Sun and Fan which examined the influence of 56 significant changes in copyright law (both statutory and case law) on copyright registrations.[144] They conclude that the primary driver behind the increased number of copyright registrations was population growth and suggest that the evidence does not support the argument that stronger copyright law incents greater creativity.[145] Ku et al. find that laws that weakened copyright protection were more likely to result in a greater number of works than those that increased protection.[146] While some legal changes did have a significant impact on registrations for certain types of works, the results of change did not evince a uniform or predictable pattern and no single change had a statistically significant impact on all types of works.[147] Expanding subject matter was found to have a greater likelihood of decreasing registrations rather than increasing them, while weakening copyright was found to have the opposite effect.[148] In their analysis of their results Ku et al. concluded that the uncertainty of success in creative markets undermines the incentive argument and argue that *homo economicus* is a poorly suited model for predicting creative behaviour.[149]

Historical evidence, survey data and econometric analysis all demonstrate that though IP has some role in innovation, it is clearly not the sole and primary drive of innovative activity. The empirical evidence also reveals that IP is often sought for strategic purposes with results that undermine the goal of innovation.

ii. Dampened Innovation through Strategic Use of IP

As noted in chapter four exclusionary IP rights create a powerful set of strategic incentives, which negatively affect innovative activity. Strengthening patent protection results in increased strategic use of patents.[150] Strategic use of patenting is common in the U.S., though even more pronounced in Japan.[151] A key strategic use of IP is limiting or facilitating entry into an industry. While some have argued that patents function as effective barriers to entry in industries producing complex products as entrants are likely to fear litigation from established players with large patent portfolios,[152] this claim does not have definitive empirical support.[153] Yet there are some prominent historical examples of patents being used to limit entry into an industry. AT&T used its patent portfolio to dominate the telephone market and General Electric and Westinghouse did the same for light bulbs.[154] For industries producing complex products, large patent portfolios help to secure a firm's position as part of an oligopoly.[155] Defensive patenting is used increasingly in the genomics industry as a means of securing freedom to operate.[156] However, there is evidence that expensive genomic databases, which can have access fees in excess of $100 million, do create a barrier for small firms to use specific research tools.[157] The IP system provides powerful strategic incentives, and empirical analyses suggest that these strategic uses do occur with innovation limiting results.

iii. Patent Backlog Problem

As the volume of patent applications increases the patent system is showing increasing signs of strain. There are concerns that too many low quality patents are being issued. Though a variety of seemingly absurd patents (such as a method for exercising a cat,[158] a method for swinging on a swing,[159] and a method of cutting hair with scissors in both hands[160]) are often highlighted in critical literature on the U.S. patent system, the simple presence of frivolous patents is neither new nor problematic.[161] However, a 2003 survey of members of the Intellectual Property Owners Association revealed that a majority of respondents favoured raising the bar for patentability.[162] As part of an effort to improve patent quality the USPTO has partnered with the New York Law School to create the

Peer to Patent program that allows citizens to review applications and submit information that will assist examiners in determining the state of prior art.[163] Japan, South Korea, the U.K., and Australia have all followed the USPTO lead and established their own Peer to Patent projects; however, Canada has yet to follow suit.[164]

The surging volume of patent applications is also resulting in major delays in approvals. In some cases the EPO may take up to 10 years to process a patent application,[165] and the typical patent application in the U.S. takes nearly three years to process.[166] With more patents being granted in China and Korea there is increasing linguistic diversity in patent applications making effective searches for prior art more difficult.[167] The backlog problem is most acute in the United States. As of January 2011, the USPTO was faced with a backlog of over 715,000 patent applications, and although this is down from a high in January 2009 of over 764,000 applications it still represents a backlog of over 100 patents per patent examiner.[168] The USPTO has been forced to respond to the backlog by introducing Project Exchange. Project Exchange allows applicants with multiple applications to withdraw those they no longer feel necessary in exchange for more rapid examination of their other applications.[169] The EPO and the Japanese Patent Office (JPO) also face large backlogs – 490,000 and 870,000 patent applications respectively.[170] A 2010 study commissioned by the U.K. Intellectual Property Office determined that backlogs at the USPTO, EPO and JPO result in over £6 billion in foregone innovation investment.[171] Alison Brimelow, President of the EPO, has suggested that the global backlog of patent applications does not result from increased R&D activity and threatens innovation.[172] She goes on to argue that the current patent environment creates a great deal of uncertainty that can be exploited for economic gain, but does not fulfill the primary policy of patents to encourage innovation and invention.[173]

iv. The Rising Cost of IP Related Litigation

Increases in patenting activity have also resulted in increased patent infringement cases (though the rate of law suits to patents has remained steady).[174] In the U.S. patent ligation volumes have tripled since 1980,[175] though it should be noted that only 1.5% of patents are litigated and only 0.1% of patents granted ever go to trial.[176] One factor

exacerbating the tendency towards increased litigation is the lucrative rewards available in patent infringement cases. Polaroid's successful suit against Kodak for patent infringement in the 1980s resulted in a $909 million payday.[177] The finding of infringement was despite the fact that Kodak had retained an independent expert who reviewed Kodak's work to ensure it was not infringing.[178] The time and monies involved in litigation represent a social cost with several sources suggesting the average patent litigation lasts two years and costs $3 million (USD) with even greater costs if there is an appeal.[179] Estimates from the U.K. show that this is not a uniquely American problem, with the estimated legal cost to challenge a patent in a simple case totaling £750,000 (and an equally large amount to defend the validity of a patent).[180] A legal battle between pharmaceutical companies Baxter and CellPro resulted in attorney's fees of $8 million,[181] and computer memory maker Infineon spent $8 million defending itself from a frivolous lawsuit by rival Rambus.[182] Bristol-Myeres Squibb spent $26 million defending itself from a patent infringement case which fortunately it was able to recover from claimant Rhone-Poulenc.[183] In 2001 the cost of legal fees in patent litigation cases exceeded $7 billion in the U.S. alone.[184] Because of the 38 patent regimes within Europe, it has been estimated that duplicate litigation costs result in between €120 and €240 million of additional costs.[185] Bessen and Meurer's comparison of litigation costs and returns from patents suggests that outside of the chemical and pharmaceutical sectors, patents, and litigation costs in particular, provide a net disincentive for innovative activity.[186] The disincentive effect is most acute for large, publicly traded firms who from 1996 to 1999 spent four times the amount in ligation costs than were generated by patent profits.[187] Increasing legal fees are reflective of the escalating dollar amounts involved in infringement cases. The problem of increasing legal costs driven by skyrocketing infringement damages shows no signs of abating. In 2009 Abbott Laboratories was ordered to pay Johnson & Johnson $1.67 billion for patent infringement only to have the verdict overturned in 2011 by CAFC that ruled Johnson & Johnson's patent invalid.[188] While some companies do benefit form jackpot infringement findings, a majority of companies find patent infringement cases too slow, uncertain and too costly compared to the benefits.[189]

The increasing legal costs, along with application costs have resulted in a curious

empirical finding – with the exception of patents in the medical instruments sector, patenting a typical invention is a net revenue loser.[190] Most patents fail to generate value for the patent holder, and a study by the JPO concluded that 60% of Japanese patents were not being used at all.[191] The high cost of potential patent litigation disincentivizes patenting for small firms.[192] Even simple legal counsel on applying for a patent can be costly with estimates putting the average lawyers' costs in the U.S. and U.K. at $13,000[193] and £13,800 respectively.[194] Although expensive, lawyers' opinions on validity are highly uncertain.[195] Litigation is also symptomatic of low quality patents. Half of the patents litigated are found to be invalid.[196] In the U.S., business method patents are seven times more likely to be ligated than other patents.[197] In addition to the direct costs of legal fees, litigation has been found to reduce the stock market value of alleged infringers by 2 percent, which can result in a loss of market value that greatly exceeds legal fees.[198] Litigation from non-practicing entities has also caused substantial transfers of wealth – primarily to lawyers – with one estimate suggesting that in the past 20 years patent troll litigation has caused an aggregate wealth loss of over half a trillion dollars in the United States alone.[199] While ballooning legal fees are a blessing for the patent bar, the costs involved represent monies diverted from innovative activity.

v. The Tenuous Connection between IP and R&D

R&D is central to innovation. Investment in research and development not only leads to innovation, but firms that engage in R&D are more likely to benefit from spillovers when other firms make technological advances.[200] However, the nature of the connection between IP and R&D is less evident. There is a clear correlation between patents and R&D; however, the direction of causality is not clear.[201] A study of Canadian manufacturing firms found that of all variables studied (such as firm size, nationality, technological strategy), R&D expenditure had the most significant impact on innovative activity.[202] However, it also noted that patenting firms are no more likely to be innovative companies that use other appropriation mechanisms.[203] The authors concluded, "the causal relationship is much stronger going from innovation to the decision to use patents than from the use of patents to innovation."[204] A Japanese study on the effects of increased patent scope revealed that for the majority of companies

expanding patent protection to new fields did not increase research investment.[205] Increased R&D spending is also correlated with a higher likelihood of being litigated against, which may serves as a disincentive to undertaking R&D.[206] While studies have found that patents do induce R&D spending, there is no clear evidence that the availability of patents increases social welfare.[207] The cost of managing IP portfolios and litigating claims of infringement does consume funds that could be spent on research and also delays research.[208] In industries where there is significant strategic patenting firms have tended to decrease R&D spending.[209] Thus while R&D is central to driving innovation, IP mechanisms are not, and in some cases may undermine the goal of innovation.

vi. The Limitations of Empirical Evidence

While extremely useful for evaluating many aspects of the patent system, empirical evidence is ultimately of little use for determining the degree to which patents spur innovation or the effects of innovation if the patent system was abolished.[210] Although the amount of empirical evidence on the connection between IP and innovation has been increased, there is still not enough evidence to make any unequivocal statements as to whether IP encourages innovation,[211] or to conclude which alternatives would best incentivize the production of intellectual goods.[212] Even WIPO acknowledges that, "inconclusive empirical evidence on patent strength and innovation relationship makes it difficult to draw any conclusion about the effectiveness of patent system to encourage R&D investments."[213]

Ultimately the ambiguity of the empirical evidence on IP and innovation does not allow the conclusion that IP always or even predominately undermines innovation. However, it also does not justify the conclusion that IP is the best system for encouraging innovation. Although there is increasing empirical evidence, it is remarkable that Penrose's 60 year old conclusion holds up today:

> The deliberate adoption of this [patent] economic policy can be justified on economic grounds only if the gains that accrue to society from it exceed the costs incurred because of it. It is indeed awkward that the costs cannot be measured nor the gains counted. As a

> result the optimum limits of the patent system, whether with respect to time, space, patentability or restrictions on the use of the grant, must always remain a subject of controversy. There is no doubt, however, that the costs have been underestimated.[214]

Machlup's assessment on the U.S. patent system in 1958 reached a similar conclusion, and his argument that no economist can declare with certainty whether patents (or IP in general) confers a net benefit or net loss to society still holds true.[215] Even after 60 years the exact nature of the relationship between IP and innovation is not fully appreciable. Further complicating analyses is the problem that the empirical literature is overwhelmingly concentrated on the subject of patents due to the fact that they are much more easily quantified than copyrights. The next section examines the important role of artistic and creative work in spurring innovation.

B. Artistic and Creative Work and Innovation

The literature on innovation tends to ignore the importance of copyright, its alternatives and artistic creativity to innovation. Because the Berne Convention precludes mandatory copyright registration mechanisms,[216] there are no readily available statistics on the volume of creative works. Though data on registered copyrights is available,[217] not all copyrights are registered. Crucial empirical data is not readily available because it is privately held.[218] While it is simple to examine the increasing volume of patents, patent applications, industrial designs and other IP indicators, copyright's lack of a mandatory registration system precludes one from calculating the number of newly produced works. The importance of artistic and creative labour has not gone completely unappreciated. The Supreme Court of Canada has recognized that artistic works are important to innovation and in the *CCH* decision it specifically emphasized, "society's interest in maintaining a robust public domain that could help foster future creative innovation."[219] The *CCH* decision has resonated beyond Canada's borders with both the India Supreme Court and Australian High Court citing the case as a dominant precedent.[220] Despite the statement by the Canadian high court, all too often the relationship between artistic and creative work is underappreciated by policymakers, courts and scholars who view innovation as solely an outcome of inventive behaviour.

Although there are the complications in measuring the volume of copyrights, artistic and creative endeavour has a clear impact on innovation in several areas. The software industry relies on copyright protection (and in some jurisdictions patent law as well), and dual use technologies – technologies that can be used for multiple purposes including copyright infringement, such as the VCR, photocopier and peer-to-peer (P2P) file sharing technologies – can be regulated through copyright.[221] Existing firms have tended to view innovative, dual use technologies as dangerous and focused on stifling such technologies with little regard to the future benefits the technology might provide. Though the movie studios fought vehemently against Sony, the manufacturer of the Betamax in the 1980s, 20 years later 80% of the studios' revenues came from sales of videocassettes and DVDs.[222] One of the major barriers to a more nuanced understanding of the connection between creativity and innovation is the problem of information asymmetry. Established rights holders can easily calculate the actual or potential costs of a new dual use technology; however, the benefits for creativity may not be immediately clear or may be spread across such a large and diverse group of actors making it difficult to develop effective counter arguments against rights holding oligopolies.[223] Copyright's reach into the area of new technology has a clear ability to limit innovation, particularly when such innovation threatens the interests of established firms.

Finally it is important to note that the relationship between artistic and creative work and copyright is not unidirectional. New innovations open up new avenues for creative expression.[224] Though user-generated content (UGC) is not a new phenomenon – individuals have always engaged in artistic and creative behaviour – the low cost distribution brought about by the internet and other ICTs has given rise to a remarkable phenomenon and important set of tools for user to express themselves.[225] From creating video mash-ups to collaboratively authoring wikis, the ascendency of UGC demonstrates the dynamic relationship between creativity and innovation. Furthermore, the flourishing of UGC does not come simply by destroying the markets for existing copyrighted works. UGC offers not only new avenues for creative expression, but also expands markets and generates new business models.[226] It serves the dual purpose of economic growth *and* expanded creative expression; however, expansive protection for existing rights holders may stifle UGC production thereby limiting creativity and innovation.[227]

Analyses of innovation that only examine patents or inventions are incomplete. While inventive behaviour is clearly critical to innovation, artistic and creative work are also important. They too facilitate innovation, and more importantly it is the human element of what we do with technological innovations that makes them important. While discourse on innovation is dominated by a focus on patents shaped largely because of their easy measurability, the crucial role of copyright and its alternatives should not be underappreciated.

In much the same way that examinations of IP overemphasize the patent-innovation link to the detriment of the role played by creative work, analyses of innovation must also be cognizant of the problem of how too many IP rights impede innovation. The following section examines how too much IP undermines innovation focusing on the danger of patent thickets and the potential for anticommons tragedies.

C. Anticommons and Patent Thickets

While proponents of IP rights argue that such rights are necessary to facilitate innovation, a recent and increasing body of scholarship has suggested that beyond a certain point too many exclusionary rights dampen innovation. This section examines the two primary approaches in this regard, Michael Heller's tragedy of the anticommons thesis and Carl Shapiro's work on patent thickets and holdup problems. The section concludes with an examination of the empirical evidence and posits that while existing empirical evidence to support these frameworks is limited, it is still important to be cognizant that there exists a potential for too many IP rights to be harmful to innovation.

i. Tragedy of the Anticommons

The tragedy of the commons thesis developed by Hardin is often viewed as a useful critique of the problems that befall common pool resources;[228] however, with respect to the management of resources through property rights (or the lack of such rights) it depicts only half of the problem. Based on an analysis of commercial property in post-Soviet Russia, Michael Heller has identified that a similar problem occurs at the opposite end of the spectrum – a tragedy of the anticommons where too many exclusionary property

rights lead to the inefficient underuse of resources.[229] Heller's anticommons thesis has direct relevance to the situation caused by excessive and fragmented IP rights.[230] He and Eisenberg quickly applied his anticommons thesis to the subject of biomedical research tools suggesting that patents and reach-through licensing agreements had the potential to create an anticommons,[231] and Heller later identified anticommons in the cases of rap music,[232] pharmaceuticals,[233] documentary filmmaking,[234] agricultural research,[235] and mobile phone technology.[236] Heller's thesis has resonated with critics of the expansionary IP regime who argue that both patents and copyrights are leading to the emergence of anticommons particularly in areas where research is cumulative, easy, or a large number of inputs are needed to produce a new intellectual good.[237] Buchanan and Yoon's economic modeling of the anticommons thesis revealed that the tragedies of the commons and anticommons produced symmetric effects, i.e. that the problems of underuse from too many excluders were equal to the problems of overuse by too many users.[238] Eisenberg, however, has revised the anticommons thesis in light of empirical evidence from the biotechnology sector. She posits that the burden of detecting infringement and the costs of suing for infringement limit the emergence of anticommons, but in situations where there is 'practical excludability' over research materials and data that are not necessarily protected by IP the risk of anticommons may be greater.[239]

Anticommons situations are particularly problematic because unlike tragedies of the commons which are easily detectable, underuse is much more difficult to detect. For example, in the case of pharmaceuticals it is difficult for there to be outrage over drugs that did not come to market because they were abandoned by their researchers.[240] Interestingly it is the same shortsighted, rational self-interested behaviour that leads to both commons and anticommons tragedies.[241] However, the classical and neoclassical economic logic that argues the solution to the tragedy of the commons is privatization exacerbates anticommons problems because it fails to recognize that too many exclusionary rights give rise to anticommons.[242] There are solutions to anticommons problems. Anticommons can be overcome through a variety of means from patent pools and blanket licensing agreements to defensive publication or engaging in intellectual work overseas where such rights may not be protected.[243] While solutions do exist the

ability for IP rights holders to strategically leverage their rights often incentivizes the creation of anticommons.

There is emerging empirical evidence to support Heller's anticommons thesis in the area of electronics. An examination over the spate of legal battles between electronics manufacturers demonstrates that anticommons do emerge to the detriment of the public. In February of 2011 LG won a preliminary injunction against Sony that allowed European customs officials to seize imports of the Japanese firm's PlayStation 3 videogame console,[244] and Apple has recently received a temporary injunction (that did not even last a full week[245]) against Samsung which prevents the latter from selling its Galaxy tablet computers in the EU.[246] Apple and Samsung are currently fighting a series of 30 legal cases in 10 different countries.[247] At issue are a range of patents including design patents covering the iPad shape, Apple patents on touch screen gesture technology and 3G wireless technology patents.[248] Samsung even announced that it would seek legal action to ban Apple's latest iPhone before it was even officially announced.[249] The USITC's ballooning case load reflects the increasing hostility, with Apple, Samsung, HTC and Nokia among others involved in a spate of investigations. Apple alone is involved in 15 pending Section 337 investigations,[250] and the table below provides a snapshot of USITC cases involving prominent smartphone and electronic manufacturers.

Table 1: Pending USITC Section 337 Investigations Involving Prominent Smart Phone and Electronics Manufacturers

Investigation Number	Complainant	Respondent(s)	Number of Patents at Issue
337-TA-701	Nokia	Apple	7
337-TA-703	Kodak	RIM, Apple	1
337-TA-704	Apple	Nokia	4
337-TA-710	Apple	HTC, Nokia	5
337-TA-717	Apple	Kodak	1
337-TA-721	HTC	Apple	5
337-TA-745	Motorola	Apple	6
337-TA-750	Apple	Motorola	3
337-TA-771	Nokia	Apple	7
337-TA-794	Samsung	Apple	5
337-TA-796	Apple	Samsung	4
337-TA-797	Apple	HTC	5
337-TA-808	HTC	Apple	8

Source: USITC (n.d.)[251]

The rancorous battle between smartphone makers, and Samsung and Apple in particular, not only generates an anticommons – Samsung products have been temporarily banned in Germany, the Netherlands and Australia to the detriment of consumers[252] – it has also attracted the attention of the European Commission that is investigating both firms for violating antitrust laws.[253] The legal battles between Samsung and Apple have descended into absurdity. The Apple design patent covering the shape of the iPad has led to Samsung citing *2001: A Space Odyssey* as prior art.[254] While European consumers suffer from injunctions that deprive them of goods, American taxpayers are faced with financing the cost of additional courtroom space at the ITC so it can handle its burgeoning Section 337 case load.[255] Heller's anticommons thesis provides a useful counterbalance to the orthodox economic logic that IP rights encourage efficient use and innovation

ii. Patent Thicket

A second, related approach to examining the problem of too many exclusionary rights is

advanced by Carl Shapiro who argues that the complex web of exclusionary rights has created a patent thicket. He defines a patent thicket as, "an overlapping set of patent rights requiring that those seeking to commercialize new technology obtain licenses from multiple patentees."[256] Though similar to Heller's anticommons thesis, Shapiro's patent thicket is not completely analogous. For Heller a single patent cannot on its own create an anticommons,[257] but Shapiro places specific emphasis on the holdup problem whereby a single patent holder can strategically impede another's research.[258] In industries that produce complex products where innovation is cumulative, patent thickets dampen innovation.[259] Although firms may be able to license IP rights, transaction costs decrease the effectiveness of licensing and act as a tax on innovation.[260] Early in their history the automobile and aviation were both subject to patent thicket problems.[261] Shapiro argues that business solutions such as cross licensing and patent pools are effective means for cutting through the thicket and may be welfare enhancing, but in turn these solutions raise antitrust concerns.[262] Shapiro's patent thicket approach not only highlights the dangers of too many property rights and the potential for holdup, but also the important, though often forgotten, role played by antitrust law in both advancing and inhibiting innovation. Influenced by the work of Shapiro and a growing recognition of the role antitrust law plays in innovation the U.S. Federal Trade Commission has committed to ensure its antitrust investigations are cognizant of innovation concerns.[263]

iii. Empirical Findings and Role of Anticommons and Patent Thickets Arguments

While anticommons and patent thicket arguments highlight the dangers of an expansionary IP regime, there are many practical considerations that impede the realization of anticommons situations. Several empirical studies have found limited incidents of anticommons emerging.[264] Walsh, Arora and Cohen's empirical study of the biomedical sector revealed that although the preconditions for an anticommons exist, there are no major breakdowns in the industry's ability to continue research.[265] Laboratory researchers frequently unknowingly infringe upon patents or believe that any infringement is covered by an exception for research.[266] Interviews with lawyers, scientists and managers in the biomedical field reveal that although initial searches may suggest that a particular project may involve many overlapping IP rights, the number of

patents that actually have to be licensed is low if not zero.[267] In some cases research may be done offshore as a method to avoid IP restrictions.[268] Cross licensing of patents is a strategy often employed to quickly clear patent thickets; however, cross licensing can also be used to limit competition and the incentive to innovate.[269] Patent owners tend to tolerate a degree of infringement based on the belief that such infringement may result in research that can add value to the patent and will generate goodwill with other researchers.[270] A study comparing licensing conditions in Japan, Germany, the U.K. and the U.S. revealed that while some difficulties do exist and overly complex negotiations cause some research paths to be abandoned, overall there is little evidence of anticommons problems.[271] These findings mirror those of an Australian study that found inconclusive evidence that an anticommons exists and its authors could not even determine if the preconditions for an anticommons existed in the Australian biotechnology sector.[272] One OECD study noted that while the potential for anticommons exists, such breakdowns are rare and not a threat to innovation.[273] In the case of copyright user created remixes and mash-ups of music and video continue to proliferate because the high costs of enforcement prevents rights holders for having complete control over their IP.[274]

While several studies have found weak support for Heller and Shapiro's arguments, there is empirical, experimental and anecdotal evidence to support their claims. A survey for the American Association for the Advancement of Science found 40 percent of survey researchers reported difficulties in obtaining rights to use patented technologies. Complex licensing negotiations were found to result in the abandonment of research projects, and anticommons problems were found to affect a range of disciplines as well as both academic and industry scientists.[275] A survey of agricultural biology researchers in the south-west United States revealed that these academics felt that the protection of research tools through IP negatively impacts their ability to conduct research.[276] A behavioral experiment that tested the anticommons thesis concluded that welfare losses from anticommons situations may be worse than situations where the tragedy of the commons existed and also found that cross licensing and patent pools (solutions to patent thickets proposed by Shapiro) were welfare enhancing.[277] A second experimental test of the anticommons thesis revealed that in anticommons situations sellers base their prices not

on the value of the underlying good but on the expected surplus of the purchaser and found that sellers' prices were inversely related to the value of their contribution.[278] In the case of copyright fair use/dealing provisions do help mitigate the problem, but anticommons and holdup still occur. Chuck D of the rap group Public Enemy has stated that the style of music on its early hit album *It Takes a Nation of Millions to Hold Us Back*, which incorporated thousands of samples, cannot be reproduced because of the fact that it would be too costly to license all the sampled music. This change has forced Public Enemy and other rappers to alter their sound and style.[279] There also numerous instances where copyright holders have used their rights to block the distribution of UGC and works of fan fiction as documented by the website Chilling Effects (http://www.chillingeffects.org/index.cgi).[280]

Although the empirical evidence on anticommons and patent thickets suggests that such concerns should not be overblown, it is critical that policymakers be mindful of how too many IP rights can impede innovation and creativity particularly in an expansionary era. Furthermore, it also demonstrates the danger in basing intellectual goods policy on neoliberal economic logic that celebrates rational self-interested behaviour and private property rights as the sole mechanism for driving innovation. The danger posed by the anticommons and patent thicket requires policymakers to consider how alternatives to IP can be used to facilitate innovation and raise social welfare.

D. Openness, Access, the Commons and Innovation

The limited effectiveness of IP rights as incentives for innovation and the problem of too many rights necessitate an examination of alternative mechanisms for facilitating the production and distribution of intellectual goods. Advocates for alternatives to IP rights frequently connect their arguments to ideas of openness, access and a shared knowledge commons that should not be circumscribed by exclusionary rights. The relative success of a number of 'open' alternatives to IP demonstrates the effectiveness of these substitutes. Finally, proponents of alternatives to IP have also examined the unique economic characteristics of information that underscore why intellectual goods should be treated as a special case. While these approaches are not without their limitations, the

invocation of the commons, open alternatives and economic arguments demonstrate the multiplicity of mechanisms through which innovation can be achieved and how IP rights can limit innovation.

i. The Intellectual/Knowledge Commons

The idea of an intellectual or knowledge commons has been adopted by a number of prominent scholars critical of the expansionary trend including James Boyle, Yochai Benkler, Peter Drahos, and Lawrence Lessig, among others. The commons concept is rooted in historical examples of natural and environmental commons such as fish stocks and grazing land.[281] Although proponents of IP frequently invoke Hardin's thesis on the tragedy of the commons, intellectual goods are non-rival in consumption and non-excludable, and when intellectual goods are rendered in a digital format they can be reproduced with virtually no marginal cost.[282] The commons should not be interpreted as a system for resource allocation that is ideologically opposed to the market (like communism), but a framework that can complement market structures.[283] For example, not only is the internet a commons, which itself is underpinned by a second commons (a commons of code),[284] it is also the most important platform for commerce. Lessig argues that the commons approach does not necessarily mean that things are free suggesting instead that the primary principle behind commons is that access is not limited by an exclusionary right.[285] The commons approach adopts a view of a positive community where resources are held in common and access is permitted, unlike the Lockean approach that merely conceives of the commons as something without value to be appropriated from.[286] The commons model also draws on Marx's concept of alienability and specifically questions what the limits of private property should be challenging the dominant neoliberal discourse.[287] The knowledge commons concept is not only an intellectually fruitful idea for encouraging debate, it crucially emphasizes the social dimension of property relations and the relationship between individuals and the community.

The commons approach has had significant practical applications. The Creative Commons licensing system that underpins many of the open alternatives is, as suggested

by the name, premised on the idea of a digital commons.[288] The Creative Commons licensing schemes can be used to protect a range of intellectual works and provides creators with the ability to determine how they want their intellectual creations to be used.[289] Commons oriented approaches have also been adopted by industry. The Patent Commons Project, a commons of software patents, includes patents from several large, high-tech companies such as IBM, HP, Nokia, Sun Microsystems, Microsoft and Oracle among others.[290] Using a scheme of different types of commitments, patent holders agree to not assert their IP rights in various circumstances allowing these firms to overcome some of the problems of expansionary IP rights.[291]

The idea of an intellectual commons provides a useful framing mechanism for ways of thinking about intellectual goods. However, a framing mechanism is insufficient on its own. The next section examines how the commons frame has been used to create alternatives to IP which not only facilitate innovation, but also allow access to the knowledge commons.

ii. 'Open' Alternatives

There exist a range of alternatives to IP many of which have achieved a moderate degree of success in facilitating innovation and enabling the production and distribution of intellectual goods. Several alternatives to IP indicate their status by use of the term 'open' (open source software, open access scholarly publishing, open educational resources, open data), although there is not uniformity with regard to how the term open is applied,[292] and in some cases an 'open *x*' title can have considerably different meanings for different users.[293] Open innovation is a particularly problematic 'open.' Though Henry Chesbrough, author of *Open Innovation: The New Imperative for Creating and Profiting from Technology*, is considered the leading proponent of open innovation,[294] he gives IP rights a central role in his conception of open innovation.[295] While several open alternatives exist, this section will briefly explore the successes and limitations of two of the most prominent alternatives – open source software and open access scholarly publishing - as they provide a great deal of insight on how these alternatives can facilitate innovation and their limitations.

Free and Open Source Software (FOSS) is arguably the most well-known and successful of the open alternatives, even drawing praise from WIPO as a successful alternative to copyright.[296] Labeling FOSS an alternative to proprietary software is an anachronism as FOSS predates proprietary software; thus from a historical perspective closed source software should be considered an alternative FOSS.[297] The primary distinguishing factor between FOSS and proprietary software is not cost,[298] but access to the source code.[299] While traditional proprietary software is copyrighted, FOSS uses a variety of different licenses, such as the GNU General Public License (GNU GPL) to maintain access and limit the ability of others to appropriate the code – a technique that is often referred to as 'copyleft.'[300] The fundamental difference between free software and open source is the normative outlook. Proponents of open source adopt a utilitarian approach to code believing that access to source code is necessary for better code, while free software developers see access to source code as an ethical obligation.[301] An important factor in the success of open source software has been the utilization of a diverse range of incentives and reputational motivations in particular.[302] Schweik and Semenov identify 28 discrete motives for participation fitting within three broad categories (technological, socio-political, and economic).[303] The harnessing of alternative motives evinces that pecuniary incentives are not the only means for encouraging innovation.

Although even WIPO acknowledges the success of open source as an alternative to IP, it is not without its shortcomings. While FOSS is often discussed as a model that is strengthened because of large numbers of people working on a project, several researchers have suggested that FOSS projects tend to be produced by relatively few individuals.[304] Project governance is critical to ensure success, but must avoid restricting freedom and becoming too hierarchical.[305] There is a significant degree of elitism within FOSS projects, which may discourage those with lower levels of status/reputation within the FOSS community from participating.[306] Despite the increasing prominence of open source software and high profile software such as Linux and Mozilla Firefox,[307] it is only in the HTTP web server market where an open source platform, the Apache web server, has a majority market share.[308] While FOSS has its limitations, it is an exemplary alternative because it demonstrates that highly innovative intellectual goods such as computer operating systems and web servers can flourish without IP protection.

Open Access Scholarly Publishing (OA) shares several similarities to FOSS. Both have roots in academic culture of the free exchange and circulation of information and both are facilitated by new technologies. OA addresses a number of issues in scholarly publishing including exorbitant subscription fees paid by libraries, greater control for authors over their works (as opposed to signing over their copyrights to publishers) and it makes scholarly work available to a broader audience by removing many of the barriers of copyright and cost.[309] Though the articles are costless to the end-user, there is still a cost to produce, host and peer-review the articles, and a wide variety of OA publishing models have emerged.[310] Even the definition of 'Open Access' is contested between various proponents of OA.[311]

While OA efforts receive considerable support from scholars, other users and libraries, institutional policies and mandates particularly those from government funding agencies are also a major factor contributing to the growth of OA. The most significant of these is the U.S. National Institutes of Health's (NIH) Public Access Policy which was first adopted in 2005.[312] In 2008 the NIH policy was strengthened from recommending deposit in the NIH's repository (PubMed Central) to mandating deposit, resulting in a surge of articles being added.[313] Though only in operation for a decade, the repository already has over 2 million articles with half of those articles being added in the past three years.[314] Increasingly various national funding agencies and universities are adopting OA mandates and policies,[315] and both the OECD and UNESCO have come out in support of OA with latter specifically noting that open access benefits scientific discovery, innovation and socio-economic development.[316]

Although OA is gaining traction with both bottom-up and top-down support, there are still several complicating factors. Several studies have revealed that OA articles have a larger impact factor and/or receive more citations;[317] however, much reluctance to OA still exists in the minds of academics who view traditional journals as having a superior reputation and being better for career advancement.[318] Though academics generally support OA when they are aware of it, awareness is low (but growing).[319] While the Directory of Open Access Journals has over 7000 different OA titles listed,[320] it represents only a small minority (roughly 15 percent) of the current number of titles

published.[321] OA discourse is overly focused on scientific, technical and medical journals, and more consideration and application of OA principles to the core mechanism for scholarly communication in the humanities, monographs, is needed.[322] Authority and legitimacy issues need careful consideration in the context of digitization, and major OA scholars typically do not pay enough attention to these.[323] Most critically, both OA and FOSS can be viewed as advancing the neoliberal, knowledge economy ideology. By having individuals circulate and create amounts of freely accessible information and emphasizing efficiency and innovation, the amount of training that needs to be done by private corporations and governments is reduced. In turn these knowledge workers can be more effectively pressed into the service of capital.[324] While this final shortcoming of FOSS and OA requires careful consideration,[325] the relative success of these alternatives in a landscape dominated by IP rights demonstrates that alternatives to IP are not only viable, but also useful means for facilitating both innovation and access while drawing on a range of incentives beyond simply pecuniary ones.

iii. Positive Feedback Effects, and Transaction Costs

Although the commons framework and open alternatives provide important, practical examples of how innovative intellectual goods can be produced without IP, there are also strong economic arguments for treating intellectual goods differently than scarce tangible property. Critics of IP in this vein point to the presence of positive feedback effects for many intellectual goods, while also highlighting that commons approaches may more effectively reduce transactions costs than property rights. Positive feedbacks effects are manifested in several ways from geographic clustering (such as that which occurs in the high tech sector in Silicon Valley and Waterloo (Canada)), to technological standards that contribute to lock-in.[326] With respect to intellectual goods and innovation, two related positive feedbacks are particularly important: increasing returns to scale in production and economies of scale in consumption (also known as network effects). Proponents of the network effects approach to information suggest that the more individuals that have access to it the greater it benefits each individual.[327] Two simple examples of network effects are the telephone network and the internet – where the greater the number of users the more valuable the network is to each user. Almost all kinds of information also

possess a network effect characteristic,[328] and not only does increased access to knowledge enhance its value, but it also raises the likelihood that such knowledge can be used to generate more innovation. Unlike traditional common resources that are subject to rivalry in consumption and overuse, the network effects properties of information suggest that it is best treated as a common good.[329] Because IP mechanisms artificially limit access to information they decrease the value of innovation while dampening the prospects for innovation.

In the same way that information is subject to network effects, knowledge based products and services are also subject to increasing returns to scale with regards to production.[330] Increasing returns to scale occur when a change in the factors of production increases output in a proportion greater than the change in the production factors.[331] In situations where one of the input factors for production is non-rival, such as information taken from the commons, increasing returns result.[332] For sectors where increasing returns and network effects are present, IP rights create a barrier to entry ultimately limiting innovation.[333] The availability of IP rights in such situations facilitates the development of non-competitive oligopolistic and monopolistic market structures.[334] The presence of increasing returns presents an even more fundamental problem than barrier to entry. Neoclassical economic theory is premised on diminishing returns to scale in production,[335] and as such its application to intellectual goods, which are commonly subject to increasing returns, appears to violate a fundamental assumption. Thus the neoclassical economic logic that extolls the benefits of exclusionary property rights is fundamentally at odds with the economic character of intellectual goods.

A second line of economic arguments against IP are centered on the idea that such rights necessarily impose costs, particularly transaction costs, which are a barrier to innovation. There are no efficiency based economic arguments for limiting access to intellectual goods.[336] IP rights create an inefficient transaction cost. While the hierarchical firm was the dominant organizational structure in the 20th century due to its ability to reduce transaction costs, peer production methods based on collaboration and drawing on the intellectual commons allow for projects of a greater scale.[337] Furthermore, peer based production methods eliminate socially wasteful duplication of effort that occurs within

competitive markets.[338] Given the presence of positive feedbacks and the high transaction costs IP can impose, a strong economic case for not treating information like scarce property can be made.

iv. Limitations of the Commons and Open Approaches

Although the commons framework and open approaches have provided both theoretical and practical alternatives to the expansionary IP regime, there are limitations. Analogizing the expansionary IP regime to the enclosure movement in England is problematic because the historical case resulted in increased productivity and growth.[339] Though a useful approach for many IP problems, a commons framework would not be a suitable mechanism to ensure the protection of traditional knowledge as it would fail to provide indigenous populations sufficient control.[340] Although an alternative to copyright, commons oriented peer production models are not well suited to produce some kinds of intellectual goods such as novels, which involve high coordination costs,[341] or open editorial blogs that degrade into a series of hate-filled rants.[342]

Critics suggest that there is little coherency in the analytical frameworks used by proponents of the commons, and argue that the appeal of the "information commons" is rhetorical.[343] Commons rhetoric does reify the concept of the commons as the crumbs leftover by the IP regime.[344] However, it serves as an important rhetorical counterweight to author-centric approaches that attempt to minimize the value of the public domain.[345] It also allows for the exploration of alternatives outside of an IP discourse dominated by the concepts of incentives, innovation and just rewards.[346] The commons frame reminds us that private property is not the only or necessarily the best mechanism for allocating goods and services.

The open alternatives to IP are not without their own shortcomings. Open alternatives are usually reliant on the copyright system, and the licensing schemes used to distribute such intellectual goods may still contain restrictions on usage.[347] For example restrictions in open source licenses can range from the relatively benign requirement that credit be given to the originator of the code to terms that prevent the mixing of code produced under differing licenses.[348] Creating an open vs. IP dichotomy is problematic

as openness should be conceived of as a continuum reflecting that there are varying degrees and types of openness.[349] Though the Creative Commons licensing scheme is central to a series of alternatives to IP, it fails to articulate a comprehensive view of access. Furthermore, to a degree it reinforces the rhetoric of private property[350] and the necessity and usefulness of the underlying copyright system.[351] Although reliant on the IP system, open alternatives demonstrate that not only do alternatives to IP exist, but that alternatives premised on access can exist and flourish.

Finally it is important to remember that commons and open alternative approaches are not simply resource management techniques, but rather social relations. Failure to appreciate the fact that property relations whether common or private are social relations will lead to ineffective analysis and policy recommendations.[352] Approaches that stress the collective benefits of information sharing should not underappreciate the importance of individual effort to the production of intellectual goods.[353]

Despite the limitations in the commons approach and open alternatives they, along with the economic arguments against exclusionary rights, serve as a powerful counterbalance to the neoclassical economic logic that extols the benefits of IP. Furthermore, the success of commons based open alternatives such as open source software and open access scholarly publishing demonstrate that IP is not a necessary mechanism for encouraging and facilitating innovation.

IV. Innovation and Ideology

Innovation is an important social and economic goal; however, as this chapter has demonstrated IP is not the sole means of encouraging innovation and in many cases may ultimately hamper innovative activity. More importantly, this chapter has also revealed the seriousness of the dynamic problems produced by IP, specifically the socially wasteful litigation that is produced by exclusionary rights. While this chapter has focused on the relationship between intellectual goods and innovation, it is now crucial to scrutinize the concept of innovation itself.

The theoretical and empirical literature examined within this chapter raises several

serious concerns about the usefulness of IP as a means of encouraging innovation, and it has demonstrated the potential dangers of excessive exclusionary rights and the success of two alternatives to IP. However, the theoretical and empirical examinations of IP are incomplete without an examination of the ideological aspects of innovation. These ideological dimensions, which include governmental policies on innovation, innovation discourse, and the linkages between innovation and theories of the information society, must be assessed as part of a holistic examination of intellectual goods. Furthermore, scrutiny of the ideological characteristics of innovation is particularly important because different types of innovation discourse are used in advancing various ideologies and normative viewpoints. It is insufficient for policymakers to support alternatives to IP that are substantively different only in terms of incentives and the type of innovation they produce. Only alternatives with a substantively different ideological character to IP can mitigate the problems of commodification, the diminution of access and the valourizing of individual self-interest.

The following chapter examines the ideological dimensions of innovation by assessing U.S. and Canadian national policies on innovation, the rhetoric of innovation and its connection with the idea of progress before finally turning to the role innovation plays in discourse on the information society.

Notes to Chapter Five:

[1] Francis Bacon, "Of Innovations," in *Bacon's Essays*, Sydney ed., Sydney Humphries (ed.), (London: Adam and Charles Black, 1912), 132-134.
[2] Smith, *An Inquiry into the Nature and Cause of the Wealth of Nations*, 16-19; and, Karl Marx and Friedrich Engels, *The Communist Manifesto*, (London: Penguin, 1985), 83.
[3] Jane Stevenson and Bilal Kaafarani, *Breaking Away: How Great Leaders Create Innovation that Drives Sustainable Growth – And Why Others Fail*, (New York: McGraw Hill, 2011), 9.
[4] Harvey, *The Condition of Postmodernity*, 125.
[5] Andrew B. Hargadon and Yellowlees Douglas, "When Innovation Meets Institutions: Edison and the Design of the Electric Light," *Administrative Science Quarterly*, 46(3), (2001), 482.
[6] Max Weber, *The Protestant Ethic and the Spirit of Capitalism*, Talcott Parsons (trans.), (Mineola, NY: Dover, 2003), 76.
[7] Robert Ostergard, "Economic Growth and Intellectual Property Rights Protection: A Reassessment of the Conventional Wisdom," in *Intellectual Property, Trade and Development: Strategies to Optimize Development in a TRIPS-Plus Era*, Daniel Gervais (ed.), (Oxford: Oxford University Press, 2007), 116; Carlaw et. al., "Beyond the Hype," 640.
[8] Though *The Theory of Economic Development* was written in 1911 it was not until 1934 that the work was translated into English. The 1934 English translation is incorporates a number of changes to the original work based on criticisms Schumpeter received of the original German publication.

[9] Schumpeter, *The Theory of Economic Development*.
[10] Schumpeter, *The Theory of Economic Development*, 68.
[11] Schumpeter, *The Theory of Economic Development*, 64.
[12] Schumpeter, *The Theory of Economic Development*, 66.
[13] Schumpeter, *The Theory of Economic Development*, 65.
[14] Schumpeter, *The Theory of Economic Development*, 66.
[15] Schumpeter, *The Theory of Economic Development*, 71.
[16] Schumpeter, *The Theory of Economic Development*, 77.
[17] Schumpeter, *The Theory of Economic Development*, 82, and 93.
[18] Schumpeter, *The Theory of Economic Development*, 94.
[19] Schumpeter, *The Theory of Economic Development*, 89.
[20] Schumpeter, *The Theory of Economic Development*, 90, and 92.
[21] Schumpeter, *The Theory of Economic Development*, 80 n. 2.
[22] Schumpeter, *The Theory of Economic Development*, 81 n. 2. Emphasis in the original.
[23] Joseph A. Schumpeter, *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, (New York: McGraw Hill, 1964), 59.
[24] Schumpeter, *Business Cycles*, 106.
[25] Schumpeter, *Capitalism, Socialism and Democracy*, 32.
[26] Schumpeter adopted this view in The Theory of Economic Development and it was maintained in Business Cycles before being changed three years later (Schumpeter, *The Theory of Economic Development*, 66; and, Schumpeter, *Business Cycles*, 69-70).
[27] Schumpeter, *Capitalism, Socialism and Democracy*, 82.
[28] Schumpeter, *Capitalism, Socialism and Democracy*, 83.
[29] Schumpeter, *Capitalism, Socialism and Democracy*, 66.
[30] Schumpeter, *Business Cycles*, 82.
[31] Schumpeter, *Capitalism, Socialism and Democracy*, 131.
[32] Schumpeter, *Capitalism, Socialism and Democracy*, 88; and, Schumpeter, *Business Cycles*, 81.
[33] Schumpeter, *Capitalism, Socialism and Democracy*, 88, n. 3 and 102.
[34] Schumpeter, *Capitalism, Socialism and Democracy*, 80.
[35] Schumpeter, *Capitalism, Socialism and Democracy*, 73.
[36] Schumpeter, *Capitalism, Socialism and Democracy*, 132 and 134; Schumpeter, *Business Cycles*, 82-83.
[37] Schumpeter, *Capitalism, Socialism and Democracy*, 156.
[38] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 616.
[39] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 619.
[40] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 622.
[41] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 623.
[42] Arrow suggests that the amount of resources should be allocated to innovation until the expected increase in marginal social benefit from innovation equals the marginal social benefit in other uses, but notes that such a calculation is difficult and tenuous because of the uncertain nature of research (Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 623)
[43] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 623-624.
[44] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 615.
[45] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 623.
[46] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 617.
[47] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 614-615.
[48] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 616.
[49] Arrow, "Economic Welfare and the Allocation of Resources for Innovation," 618.
[50] Wesley M. Cohen, "Fifty Years of Empirical Studies of Innovative Activity and Performance," in *Handbook of The Economics of Innovation*, vol. 1., Kenneth J. Arrow and Michael D. Intriligator (eds.), (Amsterdam: Elsevier, 2010), 157.
[51] Rick Szostak, *Technological Innovation and the Great Depression*, (Boulder, CO: Westview Press, 1995), 123.
[52] Stiglitz, "Economic Foundations of Intellectual Property Rights," 1705.
[53] Gilbert, "Looking for Mr. Schumpeter," 169.
[54] Cohen, "Fifty Years of Empirical Studies of Innovative Activity and Performance," 147.

[55] Philip J. Weiser, "The Internet, Innovation, and Intellectual Property Policy," *Columbia Law Review*, 103, (2003), 580.
[56] Gilbert, "Looking for Mr. Schumpeter," 205.
[57] Gilbert, "Looking for Mr. Schumpeter," 206.
[58] Michael A. Carrier, "Two Puzzles Resolved: Of the Schumpeter-Arrow Stalemate and Pharmaceutical Innovation Markets," *Iowa Law Review*, 93, (2008), 404-05.
[59] Cohen, "Fifty Years of Empirical Studies of Innovative Activity and Performance," 134, 137, and 153.
[60] F. M. Scherer, *New Perspectives on Economic Growth and Technological Innovation*, (Washington, DC: Brookings Institute, 1999), 7.
[61] Scherer, *New Perspectives on Economic Growth and Technological Innovation*, 28
[62] Robert M. Solow, "Technological Change and the Aggregate Production Function," *The Review of Economics and Statistics*, 39(3), (1957), 316.
[63] For a discussion of the connection between innovation and theories of the information society see chap. 6, s. II.
[64] Smith, *The Theory of Moral Sentiments*, 215.
[65] WIPO, *Intellectual Property: A Power Tool for Economic Growth*, (n.d.), 26: http://www.wipo.int/about-wipo/en/dgo/wipo_pub_888/index_wipo_pub_888.html
[66] Robert M. Solow, "Perspectives on Growth Theory," *The Journal of Economic Perspectives*, 8(1), (1994), 48-49; and Paul M. Romer, "Endogenous Technological Change," *Journal of Political Economy*, 98(5 pt. 2), (1990), S72.
[67] Solow, "Perspectives on Growth Theory," 52.
[68] William D. Nordhaus, *Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change*, (Cambridge, MA: MIT Press, 1969), 86; Stiglitz, "Economic Foundations of Intellectual Property Rights," 1700.
[69] G. M. Peter Swann, *The Economics of Innovation: An Introduction*, (Cheltenham, UK: Edward Elgar, 2009), 131.
[70] Gerry Sweeney, "Introduction: Innovation and Innovation Policy: The Need for Re-examination," in *Innovation, Economic Progress and the Quality of Life*, Gerry Sweeney (ed.), (Cheltenham, UK: Edward Elgar, 2001), 3.
[71] George L. Priest, "What Economists Can Tell Lawyers about Intellectual Property: Comment on Cheung," *Research in Law and Economics*, 8, (1986), 21, 22, and 24; Hall, "Business and Financial Method Patents, Innovation, and Policy," 8.
[72] WIPO, *Intellectual Property: A Power Tool for Economic Growth*, 37.
[73] Carrier, *Innovation for the 21st Century*, 2.
[74] United States – Department of Commerce – Advisory Committee on Measuring Innovation in the 21st Century Economy, *Innovation Measurement: Tracking the State of Innovation in the American Economy*, (2008), 2: http://www.innovationmetrics.gov/Innovation%20Measurement%2001-08.pdf
[75] Organisaton for Economic Cooperation and Development (OECD), *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd ed., (Paris: OECD, 2005); and, OECD, *Measuring Innovation: A New Perspective*, (Paris, OECD, 2010).
[76] Advisory Committee on Measuring Innovation in the 21st Century Economy, *Innovation Measurement*, xi and 2.
[77] Advisory Committee on Measuring Innovation in the 21st Century Economy, *Innovation Measurement*, 7.
[78] In economics a common analogy employed is that economists measure what they can find 'under the lamp post.' This argument is based on the analogy of an individual who loses his/her keys at night on a dark street. The individual is likely to look under the lamp post, not because their keys are necessarily there, but because there is light. Patents are often regarded as being something 'under the lamp post.'
[79] European Commission – European Commissioner for Research and Innovation, *Elements for Setting-up of Headline Indicators for Innovation in Support of the Europe 2020 Strategy*, (2010), 5: http://ec.europa.eu/commission_2010-2014/geoghegan-quinn/hlp/documents/20101006-hlp-report_en.pdf
[80] OECD, *Measuring Innovation*, 24.
[81] OECD, *Measuring Innovation*, 121-23.
[82] Erik Brynjolfsson, "The Productivity Paradox of Information Technology," *Communications of the ACM*, 36(12), (1993), 74.

[83] OECD, *Measuring Innovation*, 12, and 15.
[84] . Baumol, *The Free-Market Innovation* Machine, 23.
[85] Plant, "The Economic Theory Concerning Patents for Inventions," 51. Plant's speculation is supported to a degree by the analysis of Rick Szostak. Stostak concludes that the Great Depression was exacerbated by the high rate of process innovation and the comparably low rate of product innovation which caused labour markets to not clear and unemployment to surge (Szostak, *Technological Innovation and the Great Depression*, 101-02).
[86] Richard Bronk, *Progress and the Invisible Hand: The Philosophy and Economics of Human Advance*, (London: Warner Books, 1999), xv-xvi.
[87] Bronk, *Progress and the Invisible Hand*, 90.
[88] David Harvey, *The Enigma of Capital*, (Oxford: Oxford University Press, 2010), 93.
[89] Jaffe, "The U.S. Patent System in Transition," 555; and, Landes and Posner, *The Economic Structure of Intellectual Property Law*, 396.
[90] Scotchmer, *Innovation and Incentives*, 269; and, Landes and Posner, *The Economic Structure of Intellectual Property Law*, 396.
[91] Brynjolfsson and Zhang, "Innovation Incentives for Information Goods," 99.
[92] Harvey, *The Enigma of Capital*, 91.
[93] Harvey, *The Enigma of Capital*, 91.
[94] Scotchmer, *Innovation and Incentives*, 55.
[95] W. Brian Arthur, *Increasing Returns and Path Dependence in the Economy*, (Ann Arbor, MI: University of Michigan Press, 1994), 27.
[96] Scotchmer, *Innovation and Incentives*, 57.
[97] Swann, *The Economics of Innovation*, 100.
[98] Sweeney, "Introduction," 5.
[99] Stiglitz, "Economic Foundations of Intellectual Property Rights," 1713, and 1718.
[100] Stiglitz, "Economic Foundations of Intellectual Property Rights," 1712.
[101] Swann, *The Economics of Innovation*, 1264.
[102] Szostak, *Technological Innovation and the Great Depression*, 118.
[103] See chap. 4, s. I.A.
[104] Sharpiro, "Navigating the Patent Thicket," 121.
[105] Bessen and Meurer, *Patent Failure*, 89.
[106] These figures represent unweighted averages; when weighted by sales the figures are only slightly (~5%) higher (Anthony Arundel and Isabelle Kabla, "What Percentage of Innovations are Patented? Empirical Estimates for European Firms," *Research Policy*, 27, (1998), 132).
[107] Hunt, "You Can Patent That?" 11; and, Harry First, "Controlling the Intellectual Property Grab: Protect Innovation, Not Innovators," *Rutgers Law Journal*, 38, (2007), 380.
[108] Drahos, *A Philosophy of Intellectual Property*, 15.
[109] Hurt and Schuchman, "The Economic Rationale of Copyright," 425; Hall, "Business and Financial Method Patents, Innovation, and Policy," 13.
[110] Robert Hunt and James Bessen, "The Software Patent Experiment," *Federal Reserve Bank of Philadelphia Business Review*, Q3 2004, (2004), 26, and 29.
[111] Zittrain, "Normative Principles for Evaluating Free and Proprietary Software," 276.
[112] Bessen and Hunt, "An Empirical Look at Software Patents," 6.
[113] Intel, "Moore's Law and Intel Innovation."
[114] Bronwyn H. Hall and Rosemarie Ham Ziedonis, "The Patent Paradox Revisited: An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995," *RAND Journal of Economics*, 32(1), (2001), 125.
[115] Plant, "The Economic Theory Concerning Patents for Inventions," 45.
[116] Machlup and Pensrose, "The Patent Controversy in the 19th Century," 3-6.
[117] Petra Moser, "How Do Patent Laws Influence Innovation? Evidence from Nineteenth-Century World's Fairs," *American Economic Review*, 95(4), (2005), 1233.
[118] Josh Lerner, "Patent Protection and Innovation over 150 Years," *NBER Working Paper*, 8977, (2002), 27: http://www.nber.org/papers/w8977

[119] Lee G Branstetter and Mariko Sakakibara, "Do Stronger Patents Induce More Innovation? Evidence from the 1988 Japanese Patent Law Reforms," *Carnegie Mellon University Department of Social and Decision Science*, Paper 45, (2001), 21: http://repository.cmu.edu/sds/45

[120] Hall, "Business and Financial Method Patents, Innovation, and Policy," 8 and 12; Cohen et al., "Protecting Their Intellectual Assets," 2; John Baldwin, Petr Hanel and David Sabourin, "Determinants of Innovative Activity in Canadian Manufacturing Firms: The Role of Intellectual Property Rights," *Statistics Canada Analytical Studies Branch Research Paper*, 122, (2000), 17: http://www.statcan.gc.ca/pub/11f0019m/11f0019m2000122-eng.pdf ; David Schwartzman, *Innovation in the Pharmaceutical Industry*, (Baltimore, MD: Johns Hopkins University Press, 1976), 323-24; C.T. Taylor and Z. A. Silberston, *The Economic Impact of the Patent System*, (Cambridge: Cambridge University Press, 1973), 346; John Baldwin, *Innovation and Intellectual Property*, Statistics Canada Cat. No. 88-515XPE, (Ottawa, ON: Statistics Canada, 1997), 18 and 21; Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1354; Hargreaves, *Digital Opportunity*, 17: http://www.ipo.gov.uk/ipreview-finalreport.pdf ; Edwin Mansfield, Mark Schwartz and Samuel Wagner, "Imitation Costs and Patents: An Empirical Study," *The Economic Journal*, 91(364), (1981), 915; Edwin Mansfield, "Patents and Innovation: An Empirical Study," *Management Science*, 32(2), (1986), 175; Richard C. Levin, Alvin K. Klevorick, Richard R. Nelson, Sidney G. Winter, Richard Gilbert, and Zvi Griliches, "Appropriating the Returns from Industrial Research and Development," *Brookings Papers on Economic Activity*, 1987(3), (1987), 794; Anthony Arundel, "The Relative Effectiveness of Patents and Secrecy for Appropriation," *Research Policy*, 30, (2001), 615; Nijab Harabi, "Appropriability of Technical Innovation: An Empirical Analysis," *Research Policy*, 24, (1995), 983; Nuria Gonzalez-Alvarez and Mariano Nieto-Antolin, "Appropriability of Innovation Results: An Empirical Study in Spanish Manufacturing Firms," *Technovation*, 27, (2007), 289; Knut Blind, Jakob Edler, Rainer Frietsch and Ulrich Schmoch, "Motives to Patent: Empirical Evidence from Germany," *Research Policy*, 35, (2006), 661; and, Alan Hughes and Andrea Mina, "The Impact of the Patent System on SMEs," *Centre for Business Research, University of Cambridge Working Paper*, 411, (2010), 17-18: http://www.cbr.cam.ac.uk/pdf/WP411.pdf

[121] Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1354.

[122] Cohen et al., "Protecting Their Intellectual Assets," 2; Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1354; Levin et al., "Appropriating the Returns from Industrial Research and Development," 785.

[123] Baldwin, *Innovation and Intellectual Property*, 18.

[124] Taylor and Silberston, *The Economic Impact of the Patent System*, 346; Hargreaves , *Digital Opportunity*, 17; Hughes and Mina, "The Impact of the Patent System on SMEs," 17.

[125] Gonzalez-Alvarez and Nieto-Antolin, "Appropriability of Innovation Results," 286.

[126] Harabi, "Appropriability of Technical Innovation," 983; Blind et al., "Motives to Patent," 660.

[127] Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1354.

[128] 'Inventing around' is the practice of developing an innovation with the same of similar functional elements as a patented invention without infringing upon the claims of the patent invention.

[129] Cohen et al., "Protecting Their Intellectual Assets," 14.

[130] Baldwin, *Innovation and Intellectual Property*, 22.

[131] Yi Qian, "Do National Patent Laws Stimulate Domestic Innovation in a Global Patenting Environment? A Cross-Country Analysis of Pharmaceutical Patent Protection, 1978-2002," *Review of Economics and Statistics*, 89(3), (2007), 450.

[132] Mazzoleni and Nelson, "The Benefits and Costs of Strong Patent Protection," 276.

[133] Hughes and Mina, "The Impact of the Patent System on SMEs," 23.

[134] Graham et al., "High Technology Entrepreneurs and the Patent System," 1283.

[135] Cohen, "Fifty Years of Empirical Studies of Innovative Activity and Performance," 186.

[136] Commission of the European Communities, "First Evaluation of Directive 96/9/EC on the Legal Protection of Databases," *DG Internal Market and Services Working Paper*, (2005), 24: http://ec.europa.eu/dgs/internal_market/evaluation/evaluationdatabasesdirective.pdf

[137] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 234; Raymond Shih Ray Ku, Jiayang Sun and Yiying Fan, "Does Copyright Law Promote Creativity? An Empirical Analysis of Copyright's Bounty," *Vanderbilt Law Review*, 62 (2009), 1689-91.
[138] Berne Convention, art. 5(2).
[139] Landes and Posner, *The Economic Structure of Intellectual Property Law*, 247.
[140] Kai-Lung Hui and I. P. L. Png, "On the Supply of Creative Work: Evidence from the Movies," *American Economic Review*, 92(2), (2002), 219.
[141] I. P. L. Png and Qiu-hon Wang, *Copyright Duration and the Supply of Creative Work*, (2006), 15: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=932161
[142] Matthew J. Baker and Brendan M. Cunningham, "Law and Innovation in Copyright Industries," *Review of Economic Research on Copyright Issues*, 6(1), (2009), 76, and 81.
[143] Baker and Cunningham, "Law and Innovation in Copyright Industries," 81.
[144] Ku et al., "Does Copyright Law Promote Creativity?" 1689-91, and 1742-44.
[145] Ku et al., "Does Copyright Law Promote Creativity?" 1672.
[146] Ku et al., "Does Copyright Law Promote Creativity?" 1673.
[147] Ku et al., "Does Copyright Law Promote Creativity?" 1694. 1700, and 1708.
[148] Ku et al., "Does Copyright Law Promote Creativity?" 1706-07.
[149] Ku et al., "Does Copyright Law Promote Creativity?" 1718-19.
[150] Hall, "Business and Financial Method Patents, Innovation, and Policy," 10-11; Cohen et al., "Protecting Their Intellectual Assets," 4.
[151] Cohen et al., "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the United States," 1358.
[152] Hall, "Business and Financial Method Patents, Innovation, and Policy," 15.
[153] Cohen, "Patents and Appropriation," 65.
[154] Mazzoleni and Nelson, "The Benefits and Costs of Strong Patent Protection," 275.
[155] Cohen et al., "Protecting Their Intellectual Assets," 26, 29.
[156] John P. Walsh, Ashish Arora, and Wesley M. Cohen, "Effects of Research Tool Patents and Licensing on Biomedical Innovation," in *Patents in the Knowledge Economy*, Wesley M. Cohen and Stephen A. Merill (eds.), (Washington: National Academies Press, 2003), 295-96.
[157] Walsh et al., "Effects of Research Tool Patents and Licensing on Biomedical Innovation," 300-02.
[158] Kevin T. Amiss and Martin H. Abbot, Method of Exercising a Cat, US Patent 5,443,036, filed Nov. 3, 1993, and issued Aug. 22, 1995.
[159] Steven Olson, Method of Swinging on a Swing, US Patent 6,368,227, filed Nov. 17, 2000, and issued Apr. 9, 2002.
[160] Wen-Ya Yeh, Both Hand Hair Cutting Method, US Patent 6,257,248, filed Dec. 10, 1999, and issued Jul. 10, 2001.
[161] Bessen and Meurer, *Patent Failure*, 3.
[162] Iain M. Cockburn and Rebecca Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*, (2003), B.3: http://www.ipo.org/AM/Template.cfm?Section=Past_Meetings_and_Events&Template=/CM/ContentDisplay.cfm&ContentID=8564
[163] Peer to Patent, "About the Project," (n.d.): http://peertopatent.tumblr.com/abouttheproject
[164] United Kingdom – Intellectual Property Office, "Peer to Patent UK," (2011): http://www.ipo.gov.uk/peertopatent.htm ; and, Institute of Intellectual Property, "Peer to Patent in Japan," (2009): http://www.iip.or.jp/e/e_p2pj/
[165] Hargreaves, *Digital Opportunity*, 55.
[166] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*, (2011), 2: http://www.whitehouse.gov/sites/default/files/uploads/InnovationStrategy.pdf
[167] WIPO – Standing Committee on the Law of Patents, *Report on the International Patent System*, 27-28.
[168] USPTO, "Patents Dashboard," 2011: http://www.uspto.gov/dashboards/patents/main.dashxml and USPTO "Patent UPR Application Backlog," 2011: http://www.uspto.gov/dashboards/patents/kpis/kpiBacklogDrilldown.kpixml
[169] USPTO, "USPTO Opens Application Exchange Program to All Applicants to Reduce Patent Backlog," (2010): http://www.uspto.gov/news/pr/2010/10_17.jsp

[170] EPO, "Keeping the Patent System Fit for Purpose," (2 Mar. 2010): http://www.epo.org/news-issues/news/2010/20100302a.html
[171] London Economics, *Patent Backlogs and Mutual Recognition*, (2010), 64: http://www.ipo.gov.uk/p-backlog-report.pdf
[172] Alison Brimelow, "'Not Seeing the Woods for the Trees': Is the Patent System Still Fit for Purpose?" Second Annual Francis Gurry Lecture, University of Melbourne, Melbourne Australia, (1 Mar. 2010), 6 and 8: http://documents.epo.org/projects/babylon/eponet.nsf/0/94DC50B78360225EC12576DB00301EC2/$File/francis_gurry_lecture_master_en.pdf
[173] Brimelow, "'Not Seeing the Woods for the Trees'," 21.
[174] Cohen, "Patents and Appropriation," 60.
[175] Bessen and Meurer, *Patent Failure*, 17.
[176] Katharine Rockett, "Property Rights and Invention," in *Handbook of The Economics of Innovation*, vol. 1. Kenneth J. Arrow and Michael D. Intriligator (eds.), (Amsterdam: Elsevier, 2010), 321.
[177] *Polaroid Corp. v. Eastman Kodak Co*., DC Mass, 16 USPQ2d 1481 (1990).
[178] Bessen and Meurer, *Patent Failure*, 50.
[179] Richard D. Margiano, "Cost and Duration of Patent Litigation," *Managing Intellectual Property*, 186, (2009), 49; Hunt, "You Can Patent That?" 12.
[180] Andrew Gowers, *Gowers Review of Intellectual Property*, (2005), 38: http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/d/pbr06_gowers_report_755.pdf:
[181] Walsh et al., "Effects of Research Tool Patents and Licensing on Biomedical Innovation," 315.
[182] Jaffe and Lerner, *Innovation and Its Discontents*, 72.
[183] James E. Bessen and Michael J. Muerer, "The Private Costs of Patent Litigation," *Boston University School of Law and Economics Working Paper*, 07-08, (2008), 16: http://ssrn.com/abstract=983736
[184] Lemley, "Property, Intellectual Property, and Free Riding," 1064.
[185] Hargreaves, *Digital Opportunity*, 23.
[186] Bessen and Meurer, *Patent Failure*, 14-16, and 142-43.
[187] Bessen and Meurer, *Patent Failure*, 143.
[188] Susan Decker, "Abbott Wins Reversal of J&J's $1.67 Billion Patent Victory," *Bloomberg*, (23 Feb. 2011): http://www.bloomberg.com/news/2011-02-23/j-j-s-1-67-billion-patent-ruling-against-abbott-reversed-by-appeals-court.html
[189] Cockburn and Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey*, K.2.
[190] Ashish Arora, Marco Ceccagnoli and Wesley M. Cohen, "R&D and the Patent Premium," *International Journal of Industrial Organization*, 26, (2008), 1170; Wesley M. Cohen, "Patents and Appropriation: Concerns and Evidence," *Journal of Technology Transfer*, 30(1/2), (2005), 67.
[191] Kamiyama et al., "Valuation and the Exploitation of Intellectual Property," 9.
[192] Cohen et al., "Protecting Their Intellectual Assets," 15, 27; WIPO – Standing Committee on the Law of Patents, *Report on the International Patent System* , 75.
[193] Kahin, "Cyberinfrastructure and Innovation Policy."
[194] Hargreaves, *Digital Opportunity*, 88.
[195] Bessen and Meurer, *Patent Failure*, 10.
[196] Heller, *The Gridlock Economy*, 53.
[197] Bessen and Meurer, *Patent Failure*, 22.
[198] Bessen and Muerer, "The Private Costs of Patent Litigation," 11.
[199] Bessen et al. "The Private and Social Costs of Patent Trolls," 4, and 21.
[200] Baldwin et al., "Determinants of Innovative Activity in Canadian Manufacturing Firms," 8.
[201] Bessen and Meurer, *Patent Failure*, 13.
[202] Baldwin et al., "Determinants of Innovative Activity in Canadian Manufacturing Firms," 14.
[203] Baldwin et al., "Determinants of Innovative Activity in Canadian Manufacturing Firms," 19.
[204] Baldwin et al., "Determinants of Innovative Activity in Canadian Manufacturing Firms," 27.
[205] Toru Takano, "Study on Patent and Economy," *Institute of Intellectual Property Bulletin 2002*, (2002), 130: http://www.iip.or.jp/e/e_summary/pdf/detail2001/e13_11.pdf
[206] Bessen and Meurer, *Patent Failure*, 124.

[207] Arora et al., "R&D and the Patent Premium," 1173.
[208] Walsh et al., "Effects of Research Tool Patents and Licensing on Biomedical Innovation," 314.
[209] Bessen and Hunt, "An Empirical Look at Software Patents," 38-39.
[210] Arora et al., "R&D and the Patent Premium," 1155.
[211] Fischer, "Theories of Intellectual Property," 181.
[212] Zimmerman, "Cultural Preservation," 29.
[213] WIPO – Standing Committee on the Law of Patents, *Report on the International Patent System*, 9.
[214] Edith Tilton Penrose, *The Economics of the International Patent System*, (Baltimore, MD: Johns Hopkins Press, 1951), 255.
[215] Fritz Machlup, *An Economic Review of the Patent System: A Study of the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary United States Senate*, (Washington, DC: Government Printing Office, 1958), 79.
[216] Berne Convention, art. 5(2).
[217] United States - Copyright Office, "Public Catalog," (n.d.): http://cocatalog.loc.gov/cgi-bin/Pwebrecon.cgi?DB=local&PAGE=First
[218] Hargreaves, *Digital Opportunity*, 18.
[219] *CCH Canadian Lt. v. Law Society of Upper Canada*, [2004] 1 S.C.R. 339, 2004 SCC 13, para 23.
[220] Elizabeth F. Judge and Daniel Gervais, "Of Silos and Constellations: Comparing Notions of Originality in Copyright Law," *Cardozo Arts and Entertainment Law Journal*, 27, (2009), 390.
[221] Carrier, *Innovation for the 21st Century*, 3.
[222] Carrier, *Innovation for the 21st Century*, 107-08.
[223] Carrier, *Innovation for the 21st Century*, 129.
[224] Carrier, *Innovation for the 21st Century*, 128.
[225] Samuel E. Trosow, Jacquelyn Burkell, Nick Dyer-Witheford, Pamela McKenzie, Michael B. McNally, Caroline Whippey, and Lola Wong, *Mobilizing User-Generated Content for Canada's Digital Advantage*, (2010), 3: http://ir.lib.uwo.ca/fimspub/21/ ; and Daniel Gervais, "The Tangled Web of UGC: Making Copyright Sense of User-Generated Content," *Vanderbilt Journal of Entertainment and Technology Law*, 11(4), (2009), 849.
[226] Trosow et al., *Mobilizing User-Generated Content for Canada's Digital Advantage*, 35-36.
[227] Trosow et al., *Mobilizing User-Generated Content for Canada's Digital Advantage*, 43.
[228] Garrett Hardin, "The Tragedy of the Commons," *Science*, 162(3589), (1968), 1244.
[229] Michael A. Heller, "The Tragedy of the Anticommons: Property in Transition for Marx to Markets," *Harvard Law Review*, 111(3), (1998), 624.
[230] Heller, "The Tragedy of the Anticommons," 626; Michael A. Heller and Rebecca S. Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research," *Science*, 280(5364), (1998), 698; Heller, *The Gridlock Economy*, 1-2, 4-6, 9-16, 49-78, and 103-106.
[231] Heller and Eisenberg, "Can Patents Deter Innovation," 699.
[232] Heller, *The Gridlock Economy*, 13-16.
[233] Heller, *The Gridlock Economy*, 1-2; 50-55.
[234] Heller, *The Gridlock Economy*, 9-13.
[235] Heller, *The Gridlock Economy*, 57-58.
[236] Heller, *The Gridlock Economy*, 103-106.
[237] Jaffe, "The U.S. Patent System in Transition," 551; Jerome Reichman and Rochelle Cooper Dreyfuss, "Harmonization without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty," in *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-plus Era*, Daniel J. Gervais (ed.), (Oxford: Oxford University Press, 2007), 459; and, Hargreaves, *Digital Opportunity*, 34; Lessig, *The Future of Ideas*, 214-215; James Boyle, *The Public Domain: Enclosing the Commons of the Mind*, (New Haven, CN: Yale University Press, 2008), 49; and, von Hippel, *Democratizing Innovation*, 113-115.
[238] Buchanan and Yoon, "Symmetric Tragedies," 1.
[239] Eisenberg, "Comment: Costs, Norms, and Inertia," 191.
[240] Heller, *The Gridlock Economy*, 2.
[241] Hardin, "The Tragedy of the Commons," 1244; Heller, *The Gridlock Economy*, 16-17 ; and, Heller, "The Tragedy of the Anticommons," 677
[242] Heller, *The Gridlock Economy*, 34-35.

[243] Heller, *The Gridlock Economy*, 66-72.
[244] Josh Halliday, "European Customs to Seize PlayStation Shipments in Legal Dispute," *The Guardian*, (28 Feb. 2011): http://www.guardian.co.uk/technology/2011/feb/28/playstation-3-lg-legal-dispute
[245] Reuters, "Samsung Galaxy Tablet Ban Lifted in Most of Europe," *The Globe and Mail*, (16 Aug. 2011): http://www.theglobeandmail.com/news/technology/tech-news/samsung-galaxy-tablet-ban-lifted-in-most-of-europe/article2131251/
[246] Hyunjoo Jin and Poornima Gupta, "Apple Blocks Samsung from Selling Galaxy Tablet in EU," *The Globe and Mail*, (10 Aug. 2011): http://www.theglobeandmail.com/news/technology/tech-news/apple-blocks-samsung-from-selling-galaxy-tablet-in-eu/article2124845/
[247] Reuters, "Samsung to Reveal New Android 'Ice Cream Sandwich' Smartphone Oct. 19," *The Globe and Mail*, (14 Oct. 2011): http://www.theglobeandmail.com/news/technology/tech-news/samsung-to-reveal-new-android-ice-cream-sandwich-smartphone-oct-19/article2201042/ ; and, Victoria Slind-Flor, "Samsung, USPTO, Kraft, Ambercrombie: Intellectual Property," *Businessweek* (18 Nov. 2011): http://www.businessweek.com/news/2011-11-18/samsung-uspto-kraft-abercrombie-intellectual-property.html
[248] "Samsung Redesigns Galaxy Tab after Apple's Sales Ban," *BBC News*, (17 Nov. 2011): http://www.bbc.co.uk/news/technology-15773944
[249] Reuters, "Samsung Considers Legal Action over Apple's New iPhone: Source," (20 Sept. 2011): http://www.reuters.com/article/2011/09/20/us-samsung-apple-idUSTRE78I6NL20110920
[250] USITC, "Pending 337 Investigations," (n.d.): http://info.usitc.gov/ouii/public/337inv.nsf/Pending?OpenView
[251] USITC, "Pending 337 Investigations."
[252] Amy Pyett and Narayanan Somasundaram, "Apple Wins Ban on Sale of Samsung Tablet in Australia," *The Globe and Mail*, (13 Oct. 2011): http://www.theglobeandmail.com/news/technology/tech-news/apple-wins-ban-on-sale-of-samsung-tablet-in-australia/article2199797/
[253] Foo Yun Chee, "EU Commission Probes Samsung, Apple over Patents," *Reuters*, (4 Nov. 2011): http://www.reuters.com/article/2011/11/04/us-apple-samsung-eu-idUSTRE7A32LD20111104
[254] "Samsung Cites Stanley Kubrick's '2001: A Space Odyssey' Movie as Prior Art Against iPad Design Patent," *FOSS Patents* (23 Aug. 2011): http://fosspatents.blogspot.com/2011/08/samsung-cites-stanley-kubricks-2001.html
[255] USITC, *Year in Review: Fiscal Year 2010*, (2010), 1: http://usitc.gov/publications/year_in_review/pub4212.pdf
[256] Sharpiro, "Navigating the Patent Thicket," 119.
[257] Heller, *The Gridlock Economy*, 76-77.
[258] Sharpiro, "Navigating the Patent Thicket," 126.
[259] Sharpiro, "Navigating the Patent Thicket," 120; and Hall "Business and Financial Method Patents, Innovation, and Policy," 8-9.
[260] Sharpiro, "Navigating the Patent Thicket," 124, 144.
[261] Stiglitz, "Economic Foundations of Intellectual Property Rights," 1711.
[262] Sharpiro, "Navigating the Patent Thicket," 129-30.
[263] United States – Federal Trade Commission (FTC), *To Promote Innovation: The Proper Balance of Competition and Patent Law Policy*, (2003), s. 6.III.B.: http://www.ftc.gov/os/2003/10/innovationrpt.pdf
[264] Cohen and Walsh, "Access – Or Not – In Academic Biomedical Research," 14; John P. Walsh, Charlene Cho and Wesley M. Cohen, "View from the Bench: Patents and Material Transfers," *Science*, 309(5743), (2005), 2003.
[265] Walsh et al., "Effects of Research Tool Patents and Licensing on Biomedical Innovation," 297-298.
[266] Cohen, "Patents and Appropriation," 64; Katherine J. Strandburg, "User Innovator Community Norms: At the Boundary between Academic and Industry Research," *Fordham Law Review*, 77, (2009), 2254.
[267] Walsh et al., "Effects of Research Tool Patents and Licensing on Biomedical Innovation," 294.
[268] Walsh et al., "Effects of Research Tool Patents and Licensing on Biomedical Innovation," 324.
[269] Jaffe and Lerner, *Innovation and Its Discontents*, 59 and 61.
[270] Cohen and Walsh, "Access – Or Not – In Academic Biomedical Research," 17; John P. Walsh, and Hsin-I Huang, *Research Tool Access in the Age of the IP Society: Results from a Survey of Japanese Scientists*, (2007), 10: http://sippi.aaas.org/Pubs/SIPPI_Japan_IP_Survey.pdf

[271] American Association for the Advancement of Science, *International Intellectual Property Experiences: A Four Country Report*, (2007), 11-13: http://sippi.aaas.org/Pubs/SIPPI_Four_Country_Report.pdf
[272] Dianne Nicol and Jane Nielsen, "Patents and Medical Biotechnology: An Empirical Analysis of Issues Facing the Australian Industry," *Centre for Law and Genetics Occasional Paper*, 6, (2003), 177-78, and 194-95: http://www.ipria.org/publications/reports/BiotechReportFinal.pdf
[273] OECD, *Genetic Inventions, Intellectual Property Rights and Licensing Practices: Evidence and Policies*, (2002), 50, and 60: http://www.oecd.org/dataoecd/42/21/2491084.pdf
[274] Robert Merges, "Locke Remixed ;-)," *U.C. Davis Law Review*, 40 (2007), 1262.
[275] Stephen Hansen, Amanda Brewster, Jana Asher and Michael Kisielewski, *The Effects of Patenting in the AAAS Scientific Community*, 2nd Ed. (2006), 21-23: http://sippi.aaas.org/survey/AAAS_IP_Survey_Report.pdf
[276] Zhen Lei, Rakhi Juneja and Brian D. Wright, "Patents versus Patenting: Implications of Intellectual Property Protection for Biological Research," *Nature Biotechnology*, 27(1), (2009), 39.
[277] Steven Stewart and David J. Bjornstad, "An Experimental Investigation of Predictions and Symmetries in the Tragedies of the Commons and Anticommons," *Joint Institute for Energy and the Environment Report*, 2002-07, (2002), 17-18: http://isse.utk.edu/pdf/jieepubs/2002_07Experiment.pdf
[278] Ben Depoorter and Sven Vanneste, "Putting Humpty Dumpty Back Together: Experimental Evidence of Anticommons Tragedies," *George Mason Law and Economics Research Paper*, 04-53, (2007), 28-29: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=592166
[279] Kembrew McLeod, "How Copyright Law Changed Hip Hop: An Interview with Public Enemy's Chuck D and Hank Shocklee," *Stay Free*, 20, (2002): http://www.stayfreemagazine.org/archives/20/public_enemy.html
[280] Halbert, "Mass Culture and the Culture of the Masses," 947 n. 123; and, Chilling Effects Clearinghouse, "Chilling Effects," (n.d.): http://www.chillingeffects.org/index.cgi
[281] Hess and Ostrom, "Introduction," 4.
[282] Lemley, "Ex Ante versus Ex Post Justifications for Intellectual Property," 143; Hess and Ostrom, "Introduction," 11.
[283] Boiller, "The Growth of the Commons Paradigm," 38; Benkler, "Coase's Penguin," 381.
[284] Lessig, *The Future of Ideas*, 49.
[285] Lessig, *The Future of Ideas*, 20; and, Lawrence Lessig, *Code*, ver. 2.0, (New York: Basic Books, 2006), 198.
[286] Drahos, *A Philosophy of Intellectual Property*, 44.
[287] Boiller, "The Growth of the Commons Paradigm," 33.
[288] Creative Commons, "About."
[289] Creative Commons, "About."
[290] Patent Commons Project, "Find Contributors," (n.d.): http://www.patentcommons.org/commons/contributorsearch.php
[291] Patent Commons Project, "Commitments," (n.d.): http://www.patentcommons.org/resources/about_commitments.php
[292] For example open source software is software produced where the source code is accessible; however, this does not necessarily mean that the software is costless. In the case of open access scholarly publishing works are made available for free, but some restrictions contained in copyright (particularly the ability to create derivative works) may be retained.
[293] For example in its digital economy consultation document the Government of Canada commits to supporting 'open access,' but its usage of the term implies open data (Canada, *Improving Canada's Digital Advantage: Strategies for Sustainable Prosperity*, (2010), 14: http://dsp-psd.pwgsc.gc.ca/collections/collection_2010/ic/Iu4-144-2010-eng.pdf)
[294] Linus Dahlander and David Gann, "How Open Is Innovation?" *Creating Wealth from Knowledge: Meeting the Innovation Challenge*, John Bessant, and Tim Venables (eds.,) (Cheltenham, UK: Edward Elgar, 2008), 62.
[295] Chesbrough, *Open Innovation*, 56-57, and 155-176; and, Dahlander and Gann, "How Open Is Innovation?" 63-64.
[296] WIPO - Standing Committee on the Law of Patents, *Report on the International Patent System*, 70.

[297] Stallman notes that in the 1970s free software dominated (and there was at this time no legal protection for software under copyright); however, by the 1980s the proprietary model became dominant (Richard Stallman, "The GNU Operating System and the Free Software Movement," in *Open Sources: Voices from the Open Source Revolution*, (1999): http://oreilly.com/catalog/opensources/book/stallman.html; and, Josh Lerner and Jean Tirole, "Some Simple Economics of Open Source," *The Journal of Industrial Economics*, 50(2), (Jun. 2002), 200.

[298] A Stallman often notes, "think of 'free speech,' not 'free beer'" in reference to the use of 'free' in Free Software (Richard Stallman, "Why Open Source Misses the Point of Free Software," *GNU Project*, (2010): http://www.gnu.org/philosophy/open-source-misses-the-point.html

[299] Access to the source code is particularly useful for understanding how a program runs. Computers run programs from object code, but object code is not the language humans program in or something that can be understood by humans. While object code can be decompiled back into source code, it may not always be intelligible. As Zittrain notes decompiling object code to source code is like trying to determine a recipe from a finished cooked product; one may know the amount of the ingredients, but not have the knowledge to put them together in the correct manner (Zittrain, "Normative Principles for Evaluating Free and Proprietary Software," 271).

[300] For a list of licenses see: GNU Operating System, "Licenses," (2011): http://www.gnu.org/licenses/licenses.html and Open Source Initiative, "Licenses by Name," (n.d.): http://opensource.org/licenses/alphabetical

[301] Zittrain, "Normative Principles for Evaluating Free and Proprietary Software," 275; Matthew K. McGowan, Paul Stephens, and Dexter Gruber, "An Exploration of the Ideologies of Software Intellectual Property: The Impact on Ethical Decision Making*," Journal of Business Ethics*, 73, (2007): 414; and, Stallman, "Why Open Source Misses the Point of Free Software."

[302] Marcus Maher, "Open Source Software: The Success of an Alternative Intellectual Property Incentive Paradigm," *Fordham Intellectual Property, Media and Entertainment Law Journal*, 10, (2000), 632; Lerner and Triole, "Some Simple Economics of Open Source," 213, and 218.

[303] Charles M. Schweik and Andrei Semenov, "The Institutional Design of Open Source Programming: Implications for Addressing Complex Public Policy and Management Problems," *First Monday*, 8(1), (Jan. 2006): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1019/2426

[304] Liebowitz and Watt, "How to Best Ensure Remuneration for Creators in the Market for Music," 528-529; and, Charles M. Schweik and Robert English, "Tragedy of the FOSS Commons? Investigating the Institutional Designs of Free/Libre and Open Source Software," *First Monday*, 12(2), (Feb. 2007): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1619/1534

[305] Schweik and English, "Tragedy of the FOSS Commons?"; and, Simon Phipps, "The Challenge of Open Source Software – Open up with Simon Phipps, Sun's Chief Open Source Office," *Sun Inner Circle Newsletter*, (Sept. 2006): http://www.sun.com/emrkt/innercircle/newsletter/0906feature.html

[306] Lerner and Tirole, "Some Simple Economics about Open Source," 206.

[307] A cautionary note is required when highlighting Mozilla's Firefox browser as an open source project. Though the browser is now open source it has proprietary origins as the Netscape browser (Josh Lerner and Jean Triole, "Some Simple Economics of Open Source," *The Journal of Industrial Economics*, 50(2), (2002), 226).

[308] Netcraft, "June 2011 Web Server Survey," (2011): http://news.netcraft.com/archives/2011/06/07/june-2011-web-server-survey.html

[309] Peter Suber, "Creating an Intellectual Commons through Open Access," in *Understanding Knowledge as a Commons: From Theory to Practice*, Charlotte Hess and Elinor Ostrom, (eds.), (Cambridge, MA: MIT Press, 2007), 171.

[310] Willinksy, *The Access Principle*, 212-213.

[311] Charles W. Bailey, Jr., "What is Open Access," in *Open Access: Key Strategic, Technical and Economic Aspects*, Neil Jacobs, (ed.), (Oxford: Chandos, 2006), 13-19.

[312] United States – National Institutes of Health (NIH), "Policy on Enhancing Access to Archived Publications Resulting from NIH-Funded Research," (2005): http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-022.html

[313] *Consolidated Appropriations Act of 2008*, s. 218, Pub. L. No. 101-161, 121 Stat. 1843.

[314] PubMed Central, "New in PMC – PMC Hits the Two Million Mark," (2010): http://www.ncbi.nlm.nih.gov/pmc/about/new_in_pmc.html#day12

[315] University of Nottingham, "Research Funders' Open Access Policies," (2009): http://www.sherpa.ac.uk/juliet/index.php ; Peter Suber, "Open Access in the USA," *Open Access: Key Strategic, Technical and Economic Aspects*, Neil Jacobs, (ed.), (Oxford: Chandos, 2006), 153-154; and, Peter Suber, "Open Access in 2009," *SPARC Open Access Newsletter*, 141, (2 Jan., 2010): http://www.earlham.edu/~peters/fos/newsletter/01-02-10.htm

[316] OECD, *OECD Principles and Guidelines for Access to Research Data from Public Funding*, (2007), 15: http://www.oecd.org/dataoecd/9/61/38500813.pdf ; and, United Nations Educational, Scientific and Cultural Organization (UNESCO), "Open Access to Information," (2011): http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-access-to-scientific-information/

[317] Stevan Harnad and Tim Brody, "Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals," *D-Lib Magazine*, 10(6), (2004): http://www.dlib.org/dlib/june04/harnad/06harnad.html ; Kristin Antelman, "Do Open-Access Articles Have a Greater Research Impact?" *College and Research Libraries*, 65(5), (2004), 379; and Michael Kurtz and Tim Brody, "The Impact Loss to Authors and Research," in *Open Access: Key Strategic, Technical and Economic Aspects*, Neil Jacobs, ed., (Oxford: Chandos, 2006), 46-48.

[318] Thomas Hess, Rolf T. Wigand, Florian Mann, and Benedikt von Walter, *Open Access and Science Publishing: Results of a Study of Researchers' Acceptance and Use of Open Access Publishing*, (Munich: Institute for Information Systems and New Media, 2007), 13: http://openaccess-study.com/Hess_Wigand_Mann_Walter_2007_Open_Access_Management_Report.pdf

[319] Suber, "Creating an Intellectual Commons through Open Access," 189.

[320] Directory of Open Access Journals, "Directory of Open Access Journals," (2011): http://www.doaj.org/

[321] Wilinksy notes a 2004 study that estimated there were just under 50,000 journals currently in print or available electronically (Wilinsky, *The Access Principle*, 14).

[322] Gary Hall, *Digitize This Book: The Politics of New Media, or Why We Need Open Access Now*, (Minneapolis: University of Minnesota Press, 2008), 11-12.

[323] Hall, *Digitize This Book*, 12, and 54.

[324] Hall, *Digitize This Book*, 187-193.

[325] See chap. 8 s. I.D.

[326] Arthur, *Increasing Returns and Path Dependence in the Economy*, 8, and 11.

[327] Michael Polanvyi, "Patent Reform," *The Review of Economic Studies*, 11(2), (1944): 65.

[328] Insider business information is an example of a type of information which decreases in value the more widely it is known and does not possess a network effect.

[329] Boiller, "The Growth of the Commons Paradigm," 38.

[330] Arthur, *Increasing Returns and Path Dependence in the Economy*, 3; Nordhaus, *Invention, Growth, and Welfare*, 70.

[331] For a numerical example of increasing returns to scale see Romer's "Endogenous Technological Change," S75-S76

[332] Romer, "Endogenous Technological Change," S75-S76; and, Murray Fulton, "The Economics of Intellectual Property Rights: Discussion," *American Journal of Agricultural Economics*, 79(5), (1997), 1592.

[333] Reichman and Dreyfuss, "Harmonization without Consensus," 458; and, Bronk, *Progress and the Invisible Hand*," 200.

[334] Fulton, "The Economics of Intellectual Property Rights," 1593; and, Bronk, *Progress and the Invisible Hand*, 201.

[335] Arrow and Debreu, "Existence of an Equilibrium for a Competitive Economy," 267 n. 2.

[336] Scotchmer, *Innovation and Incentives*, 35; Fritz Machlup, *The Economics of Information and Human Capital*, (Princeton, NJ: Princeton University Press, 1984), 160.

[337] Benkler, "Coase's Penguin," 327, and 376-77.

[338] Benkler, "Coase's Penguin," 422.

[339] Anthony McCann, "Enclosure Without and Within the 'Information Commons,'" *Information and Communications Technology Law*, 14(3), (2005), 222; and, James Boyle, "Fencing off Ideas: Enclosure and the Disappearance of the Public Domain," *Daedalus*, Spring (2002), 14.

[340] Michael Brown, *Who Owns Native Culture*, (Cambridge, MA: Harvard University Press, 2003), 5.

[341] Benkler, "Coase's Penguin," 379, and 422.

[342] Maxwell, "Open Standards, Open Source and Open Innovation," 157.
[343] McCann, "Enclosure Without and Within the 'Information Commons,'" 220.
[344] Horowitz, "Designing the Public Domain," 1491.
[345] Boyle, *Shamans, Software and Spleens*, xiv, and 132.
[346] May, A *Global Political Economy of Intellectual Property Rights*, 181.
[347] These restrictions may range from the relatively simple and inonerous requirement that the author be identified in the Creative Commons Attribution licenses to the GNU General Public License v. 3.0.
[348] R. Polk Wagner, "Information Wants to Be Free: Intellectual Property and the Mythology of Control," *Columbia Law Review*, 103, (2003), 1030.
[349] Maxwell, "Open Standards, Open Source and Open Innovation," 122.
[350] Elkin-Koren, "What Contracts Cannot Do," 377-78.
[351] Elkin-Koren, "What Contracts Cannot Do," 400.
[352] McCann, "Enclosure Without and Within the 'Information Commons,'" 226.
[353] Ghosh, "How to Build a Commons," 216.

Chapter Six – Ideology

Building on the analysis in the previous chapter, this chapter critically scrutinizes the ideological dimensions of innovation. Scrutiny of the ideological aspects of innovation is particularly important because innovation is not a neutral, value free concept. The promotion of innovation by nations, organizations and individuals, is also the promotion of embedded ideological principles and normative viewpoints. When proponents of IP extol innovation they advance an ideological position which posits the commodification of intellectual work is not only tolerable but what ought to be. When information society proponents celebrate the emergence of a new era of innovation and fail to appreciate the role of IP they advance a similar ideological position. However, there are other ideologies and normative stances that can underpin one's promotion of innovation. Innovation is an important social goal that should be advanced, but not for its economic attributes, though they are important. Instead innovation should be pursued as a means to promote progressive social change and address a range of political, social, moral and environmental problems. For alternatives to IP to truly be substantive they advance must innovation for more than solely instrumentalist economic purposes. Innovation policy requires not only theoretical and empirical insights on incentives and innovation, but also a keen appreciation of the ideological and normative dimensions of innovation.

The key argument of this chapter is that neoliberal political ideology and neoclassical economic thought have narrowly framed innovation as a means for generating wealth and gains in productivity. This orientation has undermined other important dimensions of innovation – namely, the role of innovation in facilitating political, moral, and social progress. Information society proponents also often promote a limited conception of innovation without considering the full effects of exclusionary rights (which are usually associated with and underpin innovative activity). The failure to fully examine the role of IP, while at the same time lauding innovation, facilitates an overly optimistic account of the information society. In turn this positive information age rhetoric is then easily employed by neoliberal thinkers, policymakers and corporations to justify a vision of a society that extols efficiency, wealth production and self-interest with a significantly

lessened concern for moral, social, political and environmental progress.

The first section of this chapter examines the connection between innovation and ideology by first reviewing the current innovation policies of the American and Canadian federal governments. It then proceeds to explore the rhetorical uses of innovation describing how the concept is used in an increasingly instrumentalist, economic sense. The final part of the first section examines the connection between innovation and progress, arguing that innovation should be used for more than simply economic means. Specifically it is argued that the goal of innovation should be social, political, moral and economic advancement. The second and final section of this chapter explores the connection between information society discourses, neoliberalism, and the concept of innovation. It begins by examining the writings of Daniel Bell, Manuel Castells and David Harvey on the concept of the information society. This analysis reveals that proponents of the information age (Bell and Castells) extol the importance of innovation; however, crucially missing from this discourse is an appreciation of the role of IP (and its alternatives) in incentivizing innovative activity. The writings of Bell and Castells contrast sharply with that of Harvey who contends that the so called information age does not represent a fundamental break from industrial capitalism. Furthermore, Harvey, unlike the others, more fully appreciates the role of IP as a mechanism for not only encouraging innovation, but also as a means of capital accumulation. The chapter concludes by examining the connection between information society discourse and neoliberalism, noting that often the two are intimately linked through their shared veneration of naked self-interest and an instrumentalist focus on innovation.

I. Innovation and Ideology

Innovation is a rich concept and an important social goal with many facets. However, it is also a concept that can be exploited for a variety of ideological purposes and through the advancement of various political agendas. The first part of this section examines how national governments encourage innovative activity looking first at the range of policy levers that can be used to stimulate innovation. The U.S. and Canadian federal policies on innovation are scrutinized with special attention paid to the role each government affords

IP and its alternatives in incenting innovative activity. The second part of this section investigates innovation discourse, noting that the inherent positive connotation of innovation is often used to obscure its function within capitalism as a mechanism for wealth production. This section concludes by focusing on the Enlightenment idea of progress, and argues that the increasingly economic and instrumentalist conceptions of innovation are detached from the historical idea of progress that celebrated not only economic improvement but also political, social and moral advancement.

A. National Policies on Innovation

The importance of innovation is not lost on policymakers and almost every country has some sort of national innovation program.[1] However, creating the conditions for a flourishing national innovation ecosystem is a complex problem as there are numerous policy mechanisms national governments can use to stimulate innovation besides IP. However, each approach has its own strengths and weaknesses. Governments can conduct research through their own laboratories or fund university researchers, but such research tends to focus on basic and theoretical research, and is not often aimed at diffusing innovations through society. Primary and secondary education curricula and teacher quality can influence the potential of young people to innovate in the future; however, any resulting innovatory benefits are not immediately realized and the education system must be attuned to the present needs of students and society at large.[2] Governments can also encourage research in the business sector through direct funding of R&D or indirect funding of R&D through tax breaks. Yet general tax breaks for corporate R&D cannot be targeted to address social problems.[3] In certain sectors such as telecommunications and software, government regulation and standards can both propel and retard innovation.[4] At a more general level innovation policies too often focus on increasing the supply of innovation inputs (e.g. increasing R&D expenditures, training of more scientists and engineers), while demand-side innovation policies (such as government procurement contracts and standard setting) are less accentuated in national innovation policies.[5] Furthermore, while incenting R&D is a key piece of innovation policy, it is not the only piece, and policymakers must also strive to ensure a highly skilled workforce and knowledge flows between the public and private sector.[6] Finally, a

problems is not unique to the Obama administration. George W. Bush's innovation strategy specifically emphasized harnessing innovation to improve health care and advance hydrogen fuel cell technology.[15] While U.S. policymakers should be credited for underscoring the importance of innovation to address social and economic problems, at the time of writing Congress has demonstrated little initiative in following through on President Obama's strategy.[16]

In a February 2011 follow up to the *Strategy for American Innovation*, the White House further elaborates on and reaffirms its innovation priorities outlined in 2009.[17] The document adopts a broader definition of innovation, and specifically stresses that the social gains from innovation outweigh private gains.[18] In this regard it emphasizes that prizes should play an important incentive role and highlights the establishment of *challenge.gov*, a federal website that allows government agencies to create monetary and non-monetary prizes with the aim of allowing the public to contribute its talent and ideas to problems facing the nation (although the website fails to provide information on how many of these challenges have been solved).[19] Notably, the 2011 update to the American innovation strategy prioritizes patent reform to deal with the backlog of applications, and it states that the USPTO plans to hire 1000 new examiners within the next two fiscal years.[20] Stemming from the 2009 Open Government Directive, the USPTO is also making more information about patent applications available without cost in an effort to improve the effectiveness of the patent system.[21] While the strategy outlines several initiatives with regard to patent reform and the use of non-IP incentive systems, discussion of copyright is much more muted. The only substantive copyright policy is the continued pursuance of the Anti-Counterfeiting Trade Agreement that would further strengthen international IP enforcement and evince the continuing expansionist tendencies with respect to copyright.[22]

In addition to support for prizes the U.S. has demonstrated considerable federal backing for several other alternatives to IP. As noted in chapter 5, the NIH's open access policy has ensured that millions of research articles are freely accessible.[23] In its 2011 financial year (FY) the NIH funded $30.9 billion in health research.[24] The Obama administration has also been a leader with respect to the development of its federal open data initiative,

data.gov. *Data.gov* not only provides access to federal data sets, but encourages individuals to use such data to create innovative web applications.[25] While federal assistance for alternatives to IP in the U.S. is laudable, there are reasons for concern including budgetary pressures and potential legislative changes. The NIH budget in FY 2011 is $300 million less than in the previous financial year.[26] The Electronic Government Fund, which funds *data.gov*, has had its budget slashed from $35 million in 2010 to a measly $8 million in 2011.[27] Attempts to expand the NIH OA policy have failed twice. First proposed in 2006 the *Federal Research Public Access Act* (FRPAA) would require all federal agencies that fund more than $100,000,000 on outside (academic) research to make materials openly accessible and maintain a repository.[28] 10 departments and agencies would have been covered by FRPAA – the Departments of Agriculture, Commerce, Defense, Education, Energy, Health and Human Services, and Transportation along with the Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF).[29] Although promising, the bill never moved beyond the Senate Subcommittee on Federal Financial Management, Government Information, and International Security.[30] In the 111th Congressional session (2009-10) the FRPAA was reintroduced in both Senate (Bill 1373) and the House of Representatives (Bills 5037 and 5253), but as in 2006 these bills never moved past their respective Congressional committees/subcommittees.[31] Unfortunately, no version of FRPAA has been introduced in the current Congressional session. A cause for even greater concern is the currently proposed *Research Works Act* which would not only reverse the NIH's OA policy but prohibit all other federal agencies from doing so.[32] However, it should also be noted that two previous bills with a similar intent to the *Research Works Act* failed to be passed through Congress.[33]

On the whole the U.S. approach demonstrates a degree of balance particularly with respect to IP and its alternatives for incenting innovation. Though some expansionist tendencies remain, the focus on alternatives such as prizes and open data is encouraging.

ii. Canada

In Canada the federal government has developed a wide array of initiatives to encourage

innovative activity; however, unlike the Obama administration which has a single, unified innovation strategy document, the Canadian approach is comprised of a series of discrete governmental plans and programs. There has been no shortage of major reports[34] and editorials on Canada's ailing innovation system.[35] One of Canada's primary supporters of innovative activity is the National Research Council (NRC) Canada, an agency of the federal government. NRC both undertakes its own research and supports corporate research through programs such as the Industrial Research Assistance Program that provides financing for SMEs engaged in innovative research.[36] NRC also has developed a series of technology clusters across the country, but with few exceptions (such as pharmaceuticals and aerospace in Montreal or fuel cell technology in Vancouver) many of the clusters are not world-renowned.[37] Thriving video game development and digital media clusters in Montreal, Toronto and Vancouver have been generated through targeted tax initiatives;[38] however, the formation of such clusters stems largely from the actions of provincial governments, and the lucrative incentives provided to video game makers have been subject to the criticism that such monies could be used for more socially worthwhile research endeavours.[39] In a similar vein to NRC there is Canada Foundation for Innovation (CFI), a non-governmental organization (NGO) created by the Government of Canada in 1997 to help fund research infrastructure.[40] Canada does have a significant and generous R&D tax credit program (known officially as the Scientific Research and Experimental Design (SR&ED) Tax Incentive Program) ,[41] and leads the world in terms of percentage of GDP spent on R&D tax incentives for businesses.[42] However, the program, which cost the government $4.5 billion (CAD) in 2010, has recently been subject to a number of dubious claims about its ability to spur innovation.[43] Notable problems include a large number of unsubstantiated claims and a burgeoning industry of consultants encouraging spurious claims from companies that do little to no R&D.[44] While the SR&ED program should be enabling cutting edge research, the tax credit has also gone to low-tech innovations such as a technique for growing potted roses.[45] Canada's generous business tax credits for R&D are illustrative of the government's belief that the private sector, not government (either through direct support or research such as that conducted by NRC or through support of academic institutions (which are under provincial jurisdiction)[46]) should take the lead role in innovative

activity. This policy approach can be traced back to the Trudeau government in 1983 when it implemented the current business R&D tax break.[47] This corporate-focused strategy for promoting innovation is evinced in two of Canada's most recent innovation policy documents.

In 2007 the government unveiled it science and technology strategy entitled *Mobilizing Science and Technology to Canada's Advantage*, which continues to emphasize the centrality of corporations in undertaking innovative activity.[48] The document notes that modern IP laws are required to provide researchers and creators an opportunity to commercialize their work.[49] It also states that Canada strives for a patent policy that balances incentives for innovation and Canadian values (which are not defined). However, it also claims:

> Similarly, Canada is committed to ensuring that its copyright framework provides the legal protection necessary to give copyright-based industries the confidence to invest in and roll out new business models that make full use of leading-edge technologies, while promoting the use of these technologies by researchers to gain access to the knowledge and information needed for innovation and competitiveness.[50]

It is telling that the government emphasizes balance in patent policy, but stresses the importance of incentives for the copyright industry (not individual artists and creators) and fails to underscore the importance of a thriving public domain and fair dealing exceptions that facilitate artistic expression and creativity. While Canada's science and technology strategy does acknowledge that innovation serves some purposes beyond wealth creation, the introductory remarks from both Prime Minister Harper and Industry Minister Bernier make it clear that the primary role of the government is to create a framework for private sector, profit driven innovation.[51]

The government's belief that the private sector serves as the locus for innovation is also evident in its attempts to develop a digital economy strategy. Though the Canadian government has undertaken a consultation process in this regard, a finalized strategy has yet to be unveiled.[52] The 2010 digital economy consultation paper, *Improving Canada's Digital Advantage*, clearly prioritizes the economic benefits of digital technology over social gains.[53] Just as in the 2007 science and technology strategy described above, this

more recent consultation paper demonstrates the government's continued conviction that the private sector should take the lead in advancing the digital economy.[54] While the document does note that the government plans to increase access to government information (a pledge which it followed through on with the creation of an open data portal (data.gc.ca)[55]), it clearly suggests that IP mechanisms are the government's preferred stimulus for innovation. As Heritage Minister James Moore notes in his opening remarks, "The Government of Canada's role is to put in place a marketplace framework in which creators, inventors and entrepreneurs have the incentives to innovate, the confidence to take risks and the tools to succeed."[56] The document does note that the government will entertain suggestions for fair and appropriate remuneration schemes for creators,[57] but it does so while extolling the virtues of the copyright system, stating:

> Canada's copyright regime *is the mechanism* by which much of the economic value flows through the networks of creation-production-distribution-consumption. The *Copyright Act* is an important marketplace framework law and cultural policy instrument that must give Canadian creators, citizens, and consumers the tools they need to compete in the global digital economy. Innovation and creativity will grow where investments of time, energy and money are secure and fairly rewarded.[58]

The government continually repeats the narrow view that new copyright legislation (with expanded power for rights holders, particularly with respect to technological protection measures) is central to its digital economy strategy.[59] The government should be credited with launching an open data portal that has now grown to include over 5300 general data sets,[60] but it has not displayed any enthusiasm for other alternatives to IP such as OA and prizes. Although the 2010 consultation document has not resulted in a formal digital economy strategy being unveiled, it appears likely that the Government of Canada will continue to view its role as one of simply expanding IP incentives, particularly in the realm of copyright, while providing tepid support for alternative mechanisms for encouraging the production and distribution of intellectual goods.

While the policy mechanisms employed by the U.S. and Canadian governments differ in many regards, the most important difference is ideological. The Obama administration

has carved out a clear role for government in encouraging innovation, while the Canadian government seeks only to create an environment for business to innovate. Furthermore there is a stronger tendency in the U.S. to link innovation with broader social goals, while Canadian policy is overwhelmingly concerned with supporting innovation to increase productivity and economic growth. Although governments attach great importance to the goal of innovation, it is crucial these policies are met with critical examination. Because innovation can be incentivized through a variety of mechanisms, a governmental preference for access-limiting exclusionary rights must be justified with evidence that it produces a greater amount of innovative activity. Furthermore, it is crucial that the mechanisms used to encourage innovation be capable of directing innovative activity for broader social purposes than simply improvements to productivity and economic performance. In this regard the next section examines the danger of an increasingly hollow innovation discourse, which is the case for both countries.

B. The Danger of Empty Rhetoric on Innovation

According to the U.S. Department of Commerce's Advisory Committee on Measuring Innovation in the 21st Century Economy, innovation has become "a word of our times."[61] However, the excessive invocation by governments and corporations of innovation as a panacea for all problems is troublesome in several regards. As the word is used with increased frequency by corporate and governmental leaders as well as a blossoming industry of consultants, lobbyists and pundits, its meaning is lost; it becomes simply a descriptor for something new even if it is not better than what existed previously. Rhetorically, the term functions as something that is both simultaneously inevitable (on the descriptive level) and imperative (on the prescriptive level).[62] Translated into corporate rhetoric it becomes exemplified in the slogan "Innovate or Die"[63] – a dogmatic mantra that suggests firms must innovate or be eliminated by Schumpeter's perennial gale. The focus on the prescriptive imperative for innovation in such corporate rhetoric ignores the fact that innovative activity is inherently risky and can be socially wasteful.[64]

A second and more troublesome aspect of innovation is its strong positive connotation. Because so many innovations can be beneficial, a pro-innovation bias has emerged that

implies innovations should be diffused rapidly, broadly adopted, and not rejected.[65] The pro-innovation bias is strengthened by the fact that successful innovations are often well researched and studied, while failed innovations are often less well known and may not have left enough empirical traces to allow researchers to substantively study them.[66] The pro-innovation bias is also reinforced by the concept of the romantic author/inventor.[67] In innovation discourses the individual is extolled as a creative genius, while the contributions of the public domain are minimized.[68] George Gershwin, for example, borrowed heavily from African-American culture in composing *Rhapsody in Blue* and *Porgy and Bess*. Despite this obvious indebtedness to African-American culture, non-African-American audiences and critics lauded his work as innovative and the result of individual genius.[69] In addition, the marginalization of the public domain's contributions to innovation has been particularly acute in the area of traditional knowledge, where firms have succeeded in patenting non-novel applications of various foreign plant properties. For example, the agrochemical company W.G. Grace successfully patented the fungicidal properties of the Indian neem tree,[70] although it should be noted that W.G Grace's European patent was revoked by the EPO in 2005.[71]

The positive connotation of innovation can also be so strong that negative aspects of innovation can become hardly conceivable. To illustrate this point, let us consider the cases of both illegal and legal drug trading and manufacturing. Crack cocaine, for example, provides only marginal benefits (it is potentially quite lucrative for its non-using dealers), while on the whole it is an innovation that has created considerable social and health problems.[72] While the impact of crack cocaine is almost wholly negative, even innovative pharmaceuticals can result in undesirable outcomes. New opioid pain relievers such as oxycodone (sold under the brand names of OxyContin and Percocet), which were introduced as alternatives to morphine for pain relief, now result in more lethal overdoses than heroin and cocaine combined in the U.S.[73] While these drugs do offer innovative forms of pain relief, they have also produced considerable hardships.

It is therefore crucial to focus on how innovations can alter social relations depending on how, by whom and to what ends they may be used, rather than focusing solely on the technological features of the innovation itself. As well, some technologies that are

beneficial in the aggregate have detrimental effects in specific contexts. For example, the introduction of technology to determine the sex of fetuses in rural India and China has had unintended, yet pernicious consequences. In both of these countries, a culturally and economically influenced preference for sons has led to widespread abortions of female fetuses, which has contributed to a growing and significant gender gap. In another example, the introduction of the snowmobile in the Lapp regions of Finland has reduced travel times for Skolt reindeer herders, but it has also fueled inequality and unemployment in Skolt communities.[74] In addition, innovation has a tendency to increase existing socioeconomic inequalities as early adopters are better suited to exploit a new technology to their benefit.[75] As noted by Rogers in his review of innovation studies, "when the issue of equality has been investigated, it has been shown that the diffusion of innovations often widens the socioeconomic gap between the higher- and lower-socioeconomic status segments in a system," adding that this phenomenon occurs in both advanced and developing nations.[76]

The strong positive connotation of innovation and its dualistic imperative and inevitable qualities have made the word not simply "a word of our times" as suggested by the U.S. Department of Commerce's Advisory Committee, but *the* word of our times. Roszak has argued that 'information' has become a godword of our time – a seemingly neutral term that acts a guise for the underlying technocratic political agenda.[77] Roszak's concept of a godword is particularly useful; however, it is innovation not information that has become the godword of the 21st century. While information appears to be a seemingly neutral term, innovation is even more appealing, and is "heavily laden with positive value."[78] The positive connotation of innovation and the pro-innovation bias have obscured how innovation is employed within capitalism. The term is a useful guise for capitalist accumulation driven by wealth maximizing self-interest. It has become reified and is celebrated as the key to both national and corporate salvation.[79] It obfuscates the relentless capitalist tendency to carve out new markets, stimulate previously unknown wants and restructure social relationships under the principles of efficiency and profit maximization. The term has become increasingly conceptualized on an overly economic and instrumentalist basis as means for increasing productivity and wealth. However, innovation can serve broader purposes than a narrow, instrumentalist self-interest. The

next section explores how the conception of innovation as a means to achieve moral, social and political progress has shifted to an increasingly narrow mechanism for advancing self-interest.

C. Progress, Innovation and IP

This section examines the connection between the ideas of progress and innovation. It begins by examining the Enlightenment conception that progress should be sought for its ability to result in political, economic, social and moral improvement. The second part of this section explores the idea of progress as found in the IP clause in the U.S. Constitution. After reviewing the historical approaches to the concept of progress, this section analyzes how in current discourse innovation is often constructed in a narrow, instrumentalist, economic manner as simply a mechanism to increase productivity and wealth, as the concern for moral and social improvement has declined. The section concludes that self-interest is poorly suited as a means for achieving progress, highlighting the limitations of innovation itself to achieve progress.

i. Enlightenment View of Progress

The Enlightenment view of progress was a belief that technological improvement and expanding knowledge of the forces of nature should lead not only to material but also to political, social and moral improvement.[80] This conception of progress was in large part generated by the scientific advances of the Enlightenment and the successful American and French Revolutions.[81] However, the guillotining of 1100 Parisians in the Jacobin Terror partially tempered such optimism.[82] Condorcet, one of the leading proponents of the idea of progress, placed central emphasis on social and moral progress. He stressed that advances in the arts and sciences as a means to increase welfare and prosperity were only one avenue of progress and they should be complemented by improvements in intellectual, moral and physical faculties.[83] His enthusiasm for scientific and artistic progress to solve human problems led him to the conclusion that moral progress and advances in human reasoning would be necessary to prevent the world from becoming overpopulated.[84] Condorcet's conviction in the idea of progress was so strong that he wrote his seminal treatise on the topic, *Sketch for an Historical Picture of the Progress of*

the Human Mind, while hiding from Robespierre's Committee for Public Safety.[85] Condorcet's general attitude was shared by many other thinkers at that time including Anne-Robert Jacques Turgot in France, as well as Joseph Priestley and William Godwin in England.[86] For these Enlightenment thinkers political, social, moral and economic improvement together were each necessary elements of progress.

The importance of moral and social progress resonated in discussions on innovation and patenting, particularly during the anti-patent debate that occurred in 19th century Europe.[87] An 1851 editorial in *The Economist* noted, "The progress of knowledge, and the progress of invention and discovery, like the progress of population and the progress of society, have their ordained that settled course, which cannot be hastened, though perhaps it may be retarded, by Patent Laws."[88] The Enlightenment view of progress also had a strong influence on America's Founding Fathers.[89] In his observations on America, de Tocqueville even suggested that faith in progress was so strong in the U.S. that it seemed to defy reason.[90] As in Europe the Enlightenment idea of progress influenced thinking on innovation and ownership of knowledge. For example, Franklin rejected a patent on the Franklin Stove that he invented on a principled decision that inventions should be for the benefit of all.[91] In a famous 1813 letter Jefferson suggests that of all kinds of property, ownership of ideas is the least amenable to exclusive property rights because the same idea can be possessed by numerous individuals at one time. Jefferson also likens knowledge to a flame in that sharing it with others does not diminish the original owner's utility of it.[92] However, in the same letter he also endorsed the idea that society could grant inventors the exclusive right to profit off of their inventions.[93] Although Franklin and Jefferson were not specifically involved in the drafting of the U.S. IP clause, the idea of progress and the word 'progress' specifically appear in the clause.[94] The next sub-section examines the use of the term 'progress' in the U.S. Constitution and its lasting effect on American jurisprudence.

ii. Progress and the IP Clause of the U.S. Constitution

Progress appears explicitly in the U.S. Constitution's IP clause. Although the IP clause in the U.S. Constitution appears relatively straight forward, over the last 10 years there has

been a considerable amount of scholarly research addressing the meaning of progress in the context of the U.S. constitution.[95] Although there is limited historical evidence to glean exactly what 'progress' means in the IP clause, the promotion of progress is the foundational purpose of U.S. IP law.

While the term 'progress' is central to U.S. IP legislation, it has never been defined by the Supreme Court, and the high court has never used it to limit any expansionary legislation.[96] In *Eldred v. Ashcroft* for example the Supreme Court endorsed the argument of the Court of Appeals District of Columbia Circuit that the preambular statement "To promote the progress of science," is not a substantive limit on Congress' power.[97] Despite the decision that the preamble does not limit Congress' power to create IP rights, the Supreme Court has consistently upheld the notion that encouraging innovative activity is the primary purpose the IP clause. In the 1829 case *Pennock v. Dialogue* the Supreme Court stated:

> While one great object [of the clause] was, by holding out a reasonable reward to inventors, and giving them an exclusive right to their inventions for a limited period, to stimulate the efforts of genius; the main object was "to promote the progress of science and useful arts;" and this could be done best, by giving the public at large a right to make, construct, use, and vend the thing invented, at as early a period as possible, having a due regard to the rights of the inventor.[98]

This view has been consistently echoed in Supreme Court decisions since.[99] It should be noted that the Canadian *Patent Act* and *Copyright Act* make no such specific reference to the goal of progress.[100]

Although scholars have been unable to determine the exact meaning of 'progress' as used in the U.S. Constitution, what is clear is that progress is the primary purpose of IP law. While progress and innovation are not exact synonyms the two terms are related, and the string of decisions by the U.S. Supreme Court reveal that the ideas of progress, innovation and the public good should lie at the heart of IP law. Despite the historical conception of progress, there has been a recent tendency to conflate economic growth as

the sole measure of progress and to neglect the need for political, social and moral progress.

iii. The Modern Conflation of Economic Growth with Progress

By the middle of the 19th century American sentiment was increasingly prone to viewing improved technology as an indicator of progress in and of itself without consideration of how such technology could bring about moral, social and political improvement.[101] There are several reasons for this changing conception of progress. At the broadest level the Industrial Revolution and its seemingly endless stream of new machines has helped give rise to an increasingly technological conception of progress. However, viewing the Industrial Revolution as a series of positive technological developments also requires ignoring the numerous social problems it produced including the exploitation of both adult and child workers and high rates of injury and death.[102] In the U.S. the success of the revolution and passage of the Bill of Rights suggested that a large degree of political, social and moral improvement had already been achieved.[103] As the 19th century progressed industrial capitalists began to take on an increasingly prominent role in American society. Unlike the Founding Fathers who viewed progress through their experiences in the revolution, these new captains of industry placed greater faith in technological progress as it had been the source of their wealth.[104] The focus on the benefits of technological progress by American magnates gained currency within the larger population as the nation emerged as a global leader in several fields of 19th century technologies, from steel and oil to electricity.[105] By the end of the 19th century the American attitudes towards progress had become increasingly technocratic and focused on the idea of efficiency driven in part by the successes of Edison, Carnegie and Taylor in particular.[106] In the 20th century skepticism about the ability of technology to deliver social improvement was reinforced by the two World Wars, the industrial extermination apparatus of Nazis, the specter of nuclear annihilation and the spread of technocratic thought.[107] Although economic growth and material improvement have been an aspect of the idea of progress from the Enlightenment onward,[108] increasingly technocratic thought and Solow's work on innovation and growth in the middle of the 20th century[109] have given rise to a narrow, economic, instrumentalist conception of innovation as the only

means to achieve gains in wealth and productivity.

The instrumentalist view of progress is problematic in several regards. The succession of successful technological innovations has created the illusion that new devices are the indicator of progress, and provided fertile ground for a technological fetishism that suggests problems can always be overcome by some sort of technological or organizational innovation.[110] This fetish leads to a belief that technological progress is an end in itself,[111] minimizing the other and equally if not more important role of changes in norms, values and social relations.[112] Furthermore, such technological fetishism ignores the fact that new innovations create new problems, from the danger of industrial pollution to the abuse of opioid painkillers.[113] Technological fetishism and the pro-innovation bias have given rise to new conceptions of morality. Technologically determinist information society theories that celebrate advances in technology have also conflated technical and moral progress.[114] This ethic has advanced an amoral calculus of progress conflating instrumental rationality with morality and technical improvement as social progress.[115] While the innovations of the Industrial Revolution gave rise to the view that improved technology was an indicator of progress in and of itself, this view has been reinforced with more modern inventions, despite the problems such innovations create. Advances in ICTs that facilitate exchanges of a range of media at high speeds across the globe have convinced many segments of the population that ICT innovation itself is progress.[116] However, the constant connectivity provided by such technologies can lead to a diminution of time for reflection and critical thought.[117] Technologies such as cellphones and email have also increased expectations of workers, particularly those who must be on call at all hours.[118] Though new technologies have provided vastly expanded consumer goods markets, there has been a concomitant narrowing of the labour market with work becoming increasingly specialized and repetitive.[119] Labour saving innovations, which are highly valued by the owners of the means of production, are used not to increase the leisure time of workers, but to ensure a large industrial (and informational) reserve army and cheapen the value of labour.[120] While rapid advances in ICTs appear to suggest a steadily increasing rate of innovation little attention is paid to how such technologies are promoted to stimulate previously unknown wants. Despite the narrow-sightedness of the instrumentalist view of progress, literature on IP has become acutely affected by the

tendency to ignore innovation's ability to address political, social and moral problems.

Recent literature on IP tends to narrowly overemphasize the economic aspect of innovation. For example consider the following passage from a recent editorial in *The Globe and Mail* on the importance of innovation for those outside of the corporate world:

> In our increasingly competitive and integrated global economy, innovation is another word that carries significant weight and meaning – but not just for the for-profit element of our society.
>
> Policy makers, academic and research institutions, industry and trade associations, and think tanks -- across Canada and around the world -- are also investing considerable time and resources to better understand, develop, employ, or manage innovation in order to facilitate competitive advantage, productivity growth and/or economic expansion either for themselves or their respective communities.[121]

Nowhere are the non-economic benefits of innovation considered in this typical account of the importance of innovation. More worrisome is the rise of the instrumentalist conception of innovation in policy documents on IP. The USPTO appears to have forgotten the Constitutional clause linking IP with progress, instead focusing on rights maximization.[122] The USPTO is beholden to the reductionist view that strong IP incentives are necessary to drive innovation for the purposes of economic growth,[123] and its most recent strategic plan has only two primary goals – improve workforce excellence and facilitate economic growth – neither of which seem intimately attached to the idea of progress in science and the arts.[124] The shortsightedness of the USPTO is not unique. The mission of the Canadian Intellectual Property Office is to "accelerate Canada's economic development," and while one of its goals includes fostering innovation, its vision, mission and values statement makes no reference to actually improving the lives of Canadians.[125] WIPO describes its purpose as, "dedicated to developing a balanced and accessible international intellectual property (IP) system, which rewards creativity, stimulates innovation and contributes to economic development while safeguarding the public interest."[126] However, the organization's governing document, the WIPO Convention, clearly states that the objectives of WIPO are promoting the protection of IP and is silent on the issue of innovation or promotion of the public good.[127] Even critical

analyses of IP can become trapped in the view that the purpose of IP rights is to facilitate growth. For instance, a recent review of the U.K.'s IP system by Ian Hargreaves commissioned by the Prime Minister's Office identified several of the shortcomings of the expansionary trend; however, the report failed to examine the benefits of innovation beyond economic growth.[128] The tendency by organizations and offices responsible for IP protection to view such rights in an overly economic and instrumentalist view is particularly troubling given how innovation is crucial to addressing political, social, environmental, moral *and* economic problems.

Although the instrumentalist conception of progress and innovation is becoming increasingly common, there are still proponents of the Enlightenment view of progress. Groups such as the Center for American Progress clearly view innovation as crucial to addressing more than just economic problems.[129] Several notable international organizations still emphasize the connection between progress and innovation. The OECD notes that innovation should be used to make peoples' lives better. [130] The organisation also suggests that innovation can combat major problems facing the globe such as climate change and food security.[131] The World Health Organization (WHO) clearly notes that access to medical innovations is not simply a scientific, medicinal and economic problem, but also a moral issue.[132] The WTO's Doha Round Declaration on the TRIPS Agreement and Public Health acknowledges that IP rights should not be a barrier to protecting public health.[133] Even WIPO, despite its rather instrumentalist governing document, suggests that alternative innovation mechanisms have a role to play in advancing public interest oriented innovation.[134]

Although there is some recognition of the role innovation should play for improving moral, social, political and economic conditions, innovation is all too often simply celebrated for its ability to effect the latter of these changes. However, a greater problem exists in discourse on innovation – the overemphasis on the role of self-interest as the mechanism to drive innovation and progress.

iv. Shortcomings of Self-Interest as a Mechanism to Achieve Progress

The primary problem with the economic view that conflates growth with progress is that

it overestimates the ability of self-interested individuals and the invisible hand to achieve progress. Smith's veneration of self-interested motives in *The Wealth of Nations* must be read along with his discussion about the importance of non-self-interested motives such as sympathy and benevolence in *The Theory of Moral Sentiments*. Yet over the last 200 years his simplified framework for economic analysis has pushed aside his more nuanced view of human nature. [135] The rise of utilitarianism and the 19th century emphasis on the importance of personal liberty further reinforced the view that self-interest should be celebrated.[136] In the case of IP, the role of self-interest and discourse on incentivization has taken on specific significance. It is clear that today's IP system produces self-interested incentives for innovation; however, this situation does not reflect the empirical evidence that non-IP incentives are often more powerful motivators for innovation than patents and copyrights.[137] At a minimum, if IP is going to be used to maximize an economic value it should be consumer welfare and not private wealth.[138] Even when consumer welfare is prioritized over private wealth maximization the capitalist market structure and its pecuniary incentives are poorly suited for directing innovation to address social, political and environmental problems,[139] though they excel in creating an insatiable demand for an apparently never ending array of consumer goods.[140] Schumpeter's famous passage noting that capitalism's success had been its ability to take a good once enjoyed only by the rich such as stockings and make them available to factory girls[141] has given rise to arguments that economic growth ('growing the (economic) pie') is always preferable to redistributive mechanisms.[142] It serves the neoliberal argument that the benefits of innovation and wealth creation will trickle down, and casts aside the questions of in which directions and for what purposes should we engage in innovative activity. Corporations will necessarily direct innovative activity towards the areas of greatest potential profit. DuPont, the same company that developed rayon which was then used to put stockings within the reach of the masses, has produced an array of harmful innovations including ozone depleting chlorofluorocarbons (CFCs),[143] and participated in the Manhattan Project.[144] Ultimately the neoliberal glorification of self-interest, the single minded pursuit of profit and deregulation are not a supportive framework for achieving progress writ large.[145] In the same way Roszak argued that information provided an innocent guise for its technocratic political

agenda,[146] innovation's positive connotation and historical connection with moral and social improvement provide an excellent pretense for activity that is increasingly motivated by the narrowly self-interested pursuit of profit. However, such innovation is not well suited to achieve meaningful progress.

v. Limitations of Innovation as a Means to Achieve Progress

In the same way that one must be critical of focusing on innovation for solely economic purposes, emphasizing innovation for its ability to bring about progress also requires careful scrutiny. Accentuating progressive social change must avoid the danger of naively celebrating modernity and viewing history as having a linear trajectory.[147] Innovative technologies satisfy some material needs, but they can also bring about new mechanisms for domination, exploitation and alienation.[148] One must always be critical of how an innovation can alter the existing social, political and economic orders.[149] While innovation can improve lives and facilitate progress it can also increase the possibility of catastrophe (for example nuclear annihilation).[150] Most importantly, a belief that future innovations will generate progress should not be used as an excuse to overlook current problems.[151]

There should be no doubt that innovation can generate meaningful improvements in the quality of life, and such progress must be the goal of innovative activity. However innovation has become an increasingly hollow rhetorical trope used to legitimize highly self-interested behaviour. Such usage undermines the important role innovation plays. The final section in this chapter examines information society discourse and the central role afforded to innovation (often accompanied by an unsatisfactory examination of the role of IP rights) with a specific focus on the work of Bell, Castells and Harvey. It concludes by examining the connection between information age rhetoric, innovation, IP, neoliberalism and self-interest.

II. Innovation and the Information Society

Over the past 40 years there has been an increasing interest in the concept of the emergence of an information society or information age. Although the topic has been

approached by a wide variety of scholars and theorists, approaches to analyzing the idea of an information society are quite diverse. For instance, there are no fewer than a dozen different terms used to describe the information age.[152] Unsurprisingly, innovation plays a key role in various theories of the information society. Proponents of the information society and futurists often use celebratory, uncritical rhetoric when discussing the subject of innovation. For example, it is Alvin Toffler who suggests that second wave industrial society is giving way to third wave post-industrial society, and who argues that the current "flood of innovation is unlike any seen before in human history."[153] In addition, information society proponents such as Bell and Castells often fail to fully appreciate the role played by IP rights in their glorifications of innovation. Conversely, critics of the information society such as Harvey, Herbert Schiller and Dan Schiller tend to have a much keener appreciation of the role played by IP. This section does not provide an exhaustive review of all the various conceptions of the information society,[154] but it begins with an examination of Bell's treatment of IP and innovation. The second part of the section will examine Castells' treatment of IP and innovation before contrasting his and Bell's approach with that of Harvey. Based on these examinations the concluding section examines the connections between IP, innovation, neoliberalism and the extolling of self-interest.

A. Bell's Post-Industrial Society, IP and Innovation

Although Bell was not the first to broach the subject of the emergence of a new society and a break with industrialism, his work represented a substantive break with previous efforts due to its size and systematic nature, and has had considerable influence on policymakers.[155] While he has accumulated numerous critics over the past 40 years, Bell continues to remain relevant and was one of the top ten most cited living social science authors in the past decade.[156] Bell claims that post-industrial society is characterized by a fundamental shift in the treatment of knowledge. Unlike the industrial era where knowledge is used to coordinate the production of goods, he argues that society will move towards a system where codified theoretical knowledge is used to determine and direct change, noting that in modern science-based industries such as computers and electronics, production of goods is dependent on theoretical advances in scientific

knowledge.[157] According to Bell, theoretical knowledge becomes instrumental in determining the direction of innovative activity.[158] While Bell emphasizes the importance of theoretical knowledge as the driver of R&D, he fails to appreciate the lasting importance of entrepreneurial profit as a motive for directing innovative activity. This omission occurs despite the fact that Bell himself acknowledges the influence of Schumpeter on his own work.[159]

Bell is aware that intellectual property rights are an issue in the information society, though he describes them as mundane.[160] For Bell patents and copyrights provide an incentive function, but these rights are weak given the relative ease with which they are infringed upon or circumvented.[161] Bell is cognizant of the public good nature of information, but underappreciates how easily this public good becomes commodified or of the role played by governments in facilitating such commodification. He correctly predicts the rise of new knowledge-based industries, but crucially does not account for the role of IP in the production and distribution of intellectual goods.[162] While he views information as a source of power, his analysis is weakened by failing to see that informational power is greatly influenced by IP.[163] Bell's information exceptionalism and uncritical treatment of the role of IP serve a specific ideological purpose. They allow him to claim that the information society is disjunctive from its industrial predecessor even though commodification remains a salient feature of both.[164] Furthermore, because he accords information a special role he fails to appreciate how interconnected knowledge workers and the service industry are to the production and distribution of industrial era, tangible goods.[165] As Webster bluntly and definitively states, "*There is no novel, 'post-industrial' society: the growth of service occupations and associated developments highlight continuities of the present with the past*."[166] Rather than view the rise of service based occupations as an extension of an increasingly complex industrial economy, Bell conceives of such changes as indicators of a radical change with the past.

Although Bell's work contains many insightful passages it is marred by two primary flaws – a technologically determinist viewpoint and a naïve optimism.[167] Bell vehemently rejects the suggestion that he is a technological determinist;[168] however, his claim is undermined by his own writing: for example, "technology has created a new class,"[169]

and "technology has created a new definition of rationality."[170] Even innovation is technologically determined as he posits "economic innovation and change directly depend on new technology,"[171] eliminating the human element in innovation. Bell's technological determinist framework precludes critical questions from scrutiny such as who selects the new technologies to be developed and who benefits from their diffusion. In turn his determinism facilitates a naïve optimism. He rejects Schumpeter's pessimistic assessment of the future of capitalism, as he believes that increased planning and greater innovation will allow for the fulfillment of needs.[172] In so doing, he does not account for the continuing strength of the capitalist logic of accumulation. Bell is naïve to believe that the primacy of economic growth would be displaced by the codification of theoretical knowledge as the axial principle of society.[173] He also underappreciates the role of self-interest in governing human action. Bell states that the rising class of knowledge workers will place greater emphasis on professionalism and respect from peers resulting in a decline of emphasis on self-interest.[174] His assertion that knowledge workers would rise in prominence has not been borne out, and in many cases the reverse is true as such workers are increasingly subordinated to capital.[175] Despite the continued primacy of capital, Bell's optimistic assessment of the role of the knowledge elite has proven a powerful mechanism at garnering adherents.[176] Harris et al. note, "Another major source of Bell's success surely lies in his subtle privileging of the new class of 'information professionals'… intellectuals, businessmen, government officials, teachers, librarians and all others who immediately recognize the potential for personal growth in status and wealth in the new information society."[177] In claiming that the social, economic and cultural spheres are separate and distinct entities Bell is able to focus on the technological changes while ignoring the pervasiveness of capital across all areas of life.[178]

However it is specifically because of these shortcomings that Bell's analysis has proven so palatable for policymakers. His optimism and technocratic vision have allowed his adherents to suggest that any new problems in post-industrial society will be remedied by social planners and their increased use of theoretical knowledge.[179] Bell's general optimism and his technological determinism appear to suggest that for whatever problems post-industrial society may engender, some technological innovation exists to

solve such problems. Most importantly, he dismisses IP as a mundane issue, and fails to appreciate the increasing importance of economically self-interested behaviour.

B. Innovation and IP in Castells' Network Society

Although Manuel Castells' writings on the network society and informational capitalism are different from Bell's conception of a post-industrial society, the two share much in common, despite Castells' clear rejection of Bell's thesis.[180] Castells' writing has a commanding scope, with *The Information Age* trilogy spanning nearly 1500 pages. Of all authors on the topic, his work is the most encyclopedic and to the uncritical eye it appears the most persuasive.[181] Castells places technological innovation and information at the centre of his theory of the emergence of a network society stating that innovation is the "primordial function" of the new economy.[182] Though Bell contends that theoretical knowledge is displacing capital and labour in post-industrial society as the axial principle in society, Castells adopts a slightly different approach arguing that entrepreneurial innovation, not capital, is driving the internet economy.[183] His argument is based on the analysis of Silicon Valley where successful entrepreneurs capitalized (literally) on new ideas, while established firms that failed to innovate ended up losing out financially.[184] There is an even greater degree of Schumpeterian influence in Castells' work, and he specifically places the idea of creative destruction at the centre of his ideas noting, "the 'spirit of informationalism' is the culture of 'creative destruction' accelerated to the speed of the optoelectronic circuits that process its signals."[185] This passage is crucial in two regards. First, it evinces that Castells believes the "gale of creative destruction"[186] has picked up speed (perhaps it is now a tempest or tornado of creative destruction), but more importantly it suggests that the same phenomenon Schumpeter identified as an essential fact about capitalism remains in the information age.

Castells provides several critical and valuable insights. He recognizes the importance of the pursuit of profit in driving innovation, arguing that it is the primary motive in the internet economy.[187] He is also critical of this facet of the information age, arguing that it is accompanied with a focus on immediate gratification, workaholism, superfluous consumption and a diminished emphasis on family and personal relationships.[188] He

notes:

> Individualism is the rule; so, left alone to themselves, entrepreneurs use their extra dose of adrenalin to speed up their drive of creative destruction that ultimately leads to destructive creation. That is, to a creation of wealth in money and technology that thrives on the ruins of the social and personal lives consumed in the process.[189]

He highlights the dangers of growing inequality and most importantly the limitations of a culture of excess centered on individual self-interest.[190] He also acknowledges the ideological hegemony of neoliberalism in the 1990s.[191] While Castells offers some important insights and his work is admirable for attempting to provide a theoretical connection between seemingly discrete phenomena, it is not without serious shortcomings.

Castells' failure to include a substantive discussion of IP in his *Information Age* trilogy has been described as a fundamental flaw.[192] This omission is particularly troubling because innovation is a central topic in Castells' work. In *The Rise of the Network Society* he argues that the two factors driving innovation are research potential, the ability to engage in research, and specification ability, the application of research to a specific problem.[193] He does not address the role of IP or its alternatives in incenting innovative activity. In *The Internet Galaxy* he stresses that entrepreneurs are key factors in innovation, but there is no substantive discussion of IP and its role in either facilitating or impeding innovation.[194] When he does address IP his treatment is more passing than substantive. In *The Information Age* trilogy he notes that "intellectual property rights are a key factor in the development of the knowledge economy,"[195] yet besides this reference to how they inhibit wealth distribution he makes only two other passing references to the subject.[196] His argument that society is switching from one dominated by hierarchies to one shaped by the increasing importance of networks is undermined by the fact that shareholder ownership and hierarchical management structures continue to dominate corporate practices.[197] He claims that innovation depends on access to knowledge that is openly available, seemingly discounting both the role of IP as an incentive and its restrictions on the flow of knowledge.[198] Castells stresses that the primary issue around innovation is how to harness it without limiting creativity and research,[199] which is a

critical issue, but he fails to see through this analysis by including a discussion of IP.

Castells' later writings contain a few direct references to the role of IP. He notes that IP is central to profit making in the economy, and that the balance between users' and creators' rights is being lost.[200] He describes the debate over the role of IP as a key battle, and also concludes that business models based around IP cannot succeed as they will be supplanted by some sort of alternative.[201] However, he fails to complete this analysis by demonstrating how alternatives will triumph. Castells' 2005 essay "The Network Society: From Knowledge to Policy," contains a seminal paragraph on IP. He writes:

> Creativity and innovation are the key drivers of value creation and social change in our societies—in fact in all societies. *In a world of digital networks, the process of interactive creativity is contradicted by the legislation of property rights inherited from the industrial era*. Moreover, because large corporations have built their wealth and power on the control of these property rights, regardless of the new conditions of innovation, companies and governments are making the communication of innovation even more difficult than in the past. The capture of innovation by an intellectually conservative business world may well stall the new waves of innovation on which the creative economy and a redistributive network society depend. Even more so at the global level, as intellectual property rights become the key issue for latecomers in the global competition. International agreements on the redefinition of intellectual property rights, starting with the well rooted practice of open source software, is a must for the preservation on [sic] innovation and the fostering of creativity on which depends human progress now and then.[202]

This paragraph includes the important recognition that innovation and creativity should serve the goal of human progress and it is also his strongest criticism of the danger of expansive IP rights. However, Castells' analysis is impaired by the fact that he stresses that it is innovation not innovators (i.e. humans) that are the driving force behind creativity. Furthermore, his suggestion that IP rights be redefined on the basis of open source software is insufficient in two regards. First, he does not address the fact that open source is ultimately underpinned by the copyright system; and second, he does not show how such an alternative would work given the existing global IP framework and limited degree of flexibility within TRIPS. While Castells' more recent writings demonstrate an increased awareness of the connection between IP and innovation, he still

needs to present a more refined and thoughtful treatment of IP and its alternatives, especially given the length at which he emphasizes innovation in his work.

Castells' work is also without some problematic inconsistencies. He argues that the entrepreneurs of Silicon Valley are not Schumpeterian, but then confuses his analysis by noting that some are.[203] He claims that entrepreneurial innovation, not capital, is central the internet economy, but then notes that such entrepreneurialism would not be possible without venture capital.[204] Though he argues that "innovation is the driver of the new economy," this claim is immediately followed by the statement, "finance is the source of everything."[205] This shortcoming frustrates his analysis as it becomes difficult to determine what Castells believes is more important - innovation or capital.

Like Bell, Castells' work has been subject to a fair deal of criticism and in many respects lacks substantive differences with that of Bell's analysis.[206] Although he is less prone to overstating the case for an information age than other information society proponents, his work suffers from a degree of technological determinism, though lesser in degree than that of Bell. He claims that information technology largely determines innovative capacity.[207] He even attempts to downplay the dilemma of technological determinism, arguing that it is a "false problem."[208] His conception of informational labour is overly broad, rendering it weak analytically. This broadness is such that even some traditionally blue-collar positions can be considered as informational work.[209] Castells claims that the new economy exists on the basis of enhanced labour productivity and increased competitiveness, both of which stem from innovation.[210] While this argument contains not only a degree of technological determinism, it is a general description of a capitalist tendency and not one specific to the information age. The same argument could be used to describe the Fordist era, Ford's introduction of the assembly line, and Taylorist work practices in particular. Enhanced labour productivity and increased competitiveness are not indicators of a new economy as Castells views them, but historical tendencies of capitalism. Furthermore, there is little empirical evidence to support Castells' claim that labour productivity has markedly increased in recent times. Although there was a period of higher productivity growth in the U.S. under Reagan from 1982-86, it has largely remained within the two to three percent range since the Civil War.[211] His simplistic

view of innovation is also a weakness. Even Bell is critical of Castells for failing to differentiate between invention, innovation and the diffusion of innovation.[212]

Castells goes further than any other information society theorist in not only analyzing the idea of a network/information society,[213] but also extolling the benefits of innovation. While he addresses the subject of innovation extensively it is only in his more recent writings that he begins to reflect critically on the role of IP. His failure to engage the topic at greater length, particularly given his relentless focus on innovation and entrepreneurialism, is a major shortcoming. Castells draws on Schumpeter's work, although he does so selectively. Schumpeter initially believed that multiple motives were behind entrepreneurialism, specifically discussed the role of IP, and most importantly was not a technological determinist placing clear emphasis on the individuals (entrepreneurs) rather than the innovations. Castells also claims that the primary change in the nature of innovation from industrial creative destruction to informationalism is the speed at which it occurs.[214] This claim suggests that the network society represents only a different degree of industrial capitalism rather than a different kind of capitalism. It also obscures the importance of the changes in social relations, particularly the increased emphasis on private property, market based solutions, and deregulation that has occurred under neoliberalism. Castells provides some useful insights on the negative trends that have occurred since the 1970s; however, like Bell, his overemphasis on the positive elements of innovation, and lack of rigor in accounting for the role of exclusionary IP rights limit the usefulness of his network society thesis.

C. Innovation and IP in Harvey's Critique of Capitalism

David Harvey's analysis of the changes taking place in society is antithetical to the work of Castells and Bell. Juxtaposing Harvey's work with that of Bell and Castells is illuminating, because though he deals with the same subject matter as the others his conclusions are significantly different. Furthermore, Harvey's analysis has been particularly insightful with regard to its ability to foresee recent crises in capitalism. Notably, in 2006 Harvey foretold the 2007-08 property market crash,[215] and he warned of the dangers of burgeoning U.S. foreign debt well in advance of the August 2011 U.S.

sovereign debt crisis.[216] Harvey's position differs from Castells', who by contrast is critical of the idea that the new economy will suffer from speculative bubbles.[217]

Like Castells and Bell, Harvey acknowledges the crucial role played by innovation; however, drawing on Marx he views innovation as an essential and historical feature of capitalism and not a new phenomenon.[218] Furthermore, unlike proponents of the information society, he is highly critical of certain kinds of innovation. While he acknowledges that innovation is a historical element of capitalism, he argues the Cold War arms race made innovation paramount because of the impending Soviet military threat.[219] He is critical of how social inequality is used to encourage entrepreneurial risk taking.[220] While Harvey acknowledges that innovation has produced new goods and services, he is critical of how it can alter social relations in a destabilizing manner.[221] Drawing on Marx, Harvey contends that the primary purpose of innovation is to speed the money-commodity-money cycle and improve transport of commodities.[222] The stimulation of new wants and desires for the outputs of innovation introduces uncertainty to labour markets and can wipe out whole economic sectors.[223] Entrepreneurialism and innovation are central elements of capitalism that not only facilitate economic action, but more importantly create an environment where social relations are construed along instrumentalist purposes.[224] For capitalists, innovation is a necessary mechanism to ensure profitability and labour surpluses that weaken the position of workers and lower wages.[225] Harvey argues that innovation accounts for the majority of U.S. job losses and twice as many losses as caused by firms relocating production sites to locales outside of the U.S.[226] He is critical of Schumpeter for overemphasizing the benefits of creative destruction while not sufficiently appreciating its necessarily destructive elements,[227] and romanticizing the role of entrepreneurs as the sole source of innovation.[228] For Harvey the increased spending on information technology is not evidence of a new economy, but the result of technological change being shaped by financialization. He further argues that such technology is given a privileged status in neoliberalism for its ability to facilitate speculative activity.[229]

Harvey places primary emphasis on the role of innovation in facilitating the growth of capitalism, with financial innovations playing a particularly important role since 1973

due to the collapse of the international financial system developed at the end of World War II at the Bretton Woods conference.[230] Harvey pays special attention to financial innovations including the development of electronic banking, plastic money, the creation of futures and equity futures markets, currency and interest rate swaps, collateralized debt obligations (CDOs), and credit default swaps, among others.[231] The result is a trade in these financial products that went from an insignificant value in 1990 to over $600 trillion annually by 2008[232] - a value roughly 10 times global GDP for that year.[233] The purpose of these financial innovations is to absorb the massive sums of capital produced in an effort to maintain economic growth.[234] Ballooning capital surplus requires faster rates of innovation, which also become more speculative in nature.[235]

While Harvey provides a pervasive critique of capitalist innovation, his view of capitalism is not entirely negative. He does argue that capitalism on its own cannot be blamed for things like urban sprawl and increased meat consumption that arise from changes in socio-cultural preferences.[236] Furthermore, he also notes that without capitalism there may not have been a way to support the world's expanding population over the past three centuries unless alternative methods of providing goods had been developed.[237]

Harvey is also much more attuned to the role of IP than most information society advocates. He is critical of monopoly rent seeking that results from capitalist interest in cultural activities, which can take forms as diverse as the production of sporting spectacles like the Olympics and the commodification of tourism, but notes that IP rights represent a particularly sinister form of rent seeking and monopoly rights.[238] Rather than viewing patents as a stimulant for innovation, he argues that monopoly rights help to limit the pace of innovation and lessen the ability of innovation to destabilize capitalism[239] - a similar view to that of Schumpeter who saw patents as a mechanism for stabilizing the economy in light of creative destruction. IP rights and the undermining of common property rights are seen as one mechanism through which neoliberal governments have facilitated a transfer of wealth to elites.[240] He argues the commodification of information is not a generative wealth creating process, but instead a redistribution from the dispossessed (ranging from the holders of traditional knowledge

to artistic labourers) to powerful rights holders.[241] He is critical of how commodification takes properties of things such as originality, uniqueness and creativity and transforms them into commodities.[242] Harvey warns that increasing IP rights may lead to the eventual patenting of human life.[243] IP is part of a broader pattern of commodification that has occurred under neoliberalism where a range of common property rights have been converted into private property against the broad will of the general public.[244] Although he is highly critical of IP and capitalist innovation, Harvey is not opposed to innovation *per se*; rather, he advocates for technological innovations that support the common good and not private gain.[245]

Harvey's criticism of the expanding neoliberal regime stands in sharp contrast to the work of information society theorists such as Bell and Castells. His analysis demonstrates that the changes occurring in society represent an exacerbation of the destructive elements in capitalism. While others celebrate innovation, Harvey is highly critical of the tendency for innovation to be used within a broader neoliberal capitalist logic that promotes increased commodification and a strengthening of the power of elites. More importantly, Harvey is mindful that there are a multitude of dynamic forces shaping capitalism of which innovation is only a single but important factor.[246] He demonstrates a much clearer appreciation of the role of IP and its connection with innovation and neoliberalism. Finally his analysis is greatly strengthened by his ability to foresee the 2007-08 economic crisis. Most importantly, while Bell celebrates the increasing codification of theoretical knowledge and Castells emphasizes the spirit of informationalism, Harvey directs attention toward neoliberalism and its centrality in shaping changing social relations. Harvey's critical examination of capitalism and neoliberalism provide an extremely useful framework for analyzing the connection between neoliberalism and innovation. This chapter concludes by further exploring the connection between neoliberalism, innovation, IP and theories of the information society with a particular emphasis on their connecting ideological commonalities.

D. Innovation, IP, and Neoliberalism

An examination of the connection between theories of the information society and

innovation on its own is insufficient. Theories of the information society are just that – theories; without an inquiry into the actual political and economic changes that have occurred over the past 40 years (roughly since the first edition of Bell's postindustrial thesis) such an analysis would fail to account for the ways in which information society discourse has influenced policymakers. As discussed in chapter 3, there has been a markedly expansionary IP policy centered in the U.S., but also manifested in other advanced economies and perpetrated on a global scale through TRIPS. A second change that requires scrutiny is the flourishing of neoliberalism and its relation to information society discourse.

Information society discourse and neoliberalism are intimately linked. At first glance the neoliberal approach which favours deregulation and celebrates the virtues of competition unfettered by government interference would be at odds with monopoly IP rights;[247] however, the fundamental principle behind neoliberalism is not the complete diminution of the state but the use of state power to maximize the business climate for capital accumulation.[248] Both are premised on liberalism and the respect for property rights, and emphasize the free market as the ideal allocative mechanism.[249] Although information society theorists often downplay the central role of IP rights, information age discourse and neoliberal economic logic combine and mutually reinforce the notion that IP is necessary to advance innovation.[250] The promise of innovation and the potential for a larger slice of an ever expanding economic pie are used to justify exclusionary rights that limit access to knowledge.[251] Information society rhetoric was used by Thatcher and Reagan in the 1980s as part of their neoliberal policies that transferred increased power from the state to private enterprise through deregulation and privatization.[252] Bell's work had a direct influence on the Reagan administration[253] and also provided a conceptual underpinning to information society policies in Europe and the Clinton administration.[254] Bell's optimistic vision of a post-industrial future has not only influenced policymakers at the highest level; it has also provided conceptual and rhetorical mechanisms that have been used to deploy neoliberal policies.

Neoliberals have been adept at employing the idea of an information age to mask policies where the greatest benefits accrue to those in the most privileged positions. For example,

the Clinton administration's *National Information Infrastructure: Agenda for Action* begins with a series of promises including, "the vast resources of art, literature, and science… [will be] available everywhere," through networked computers and, "you could see the latest movie, play the hottest video games… whenever you chose."[255] However, the document goes on to detail how a major policy goal is the strengthening of IP rights both domestically and internationally noting that while the public interest may lie in broad dissemination, protection of IP is crucial.[256] This approach is not uniquely American; it is used in the recent Canadian government consultation paper on the digital economy, and at an international level as the United Nation's World Summit on the Information Society which depicted, "a wholly utopian picture of an 'Information Society' that grossly oversimplifies and generalizes a complex issue and social phenomenon."[257] The allure of an information age with a never ending array of new technologies to consume is the perfect guise for a neoliberal political agenda underpinned by neoclassical economic logic.

The common ideological principle that unifies neoliberalism, information society discourse, IP and innovation is the valorization of individual self-interest. Neoliberalism is premised on promoting self-interest,[258] but disguises this trait by employing rhetoric on entrepreneurialism, freedom and empowerment.[259] Information society proponents have tended to underestimate the negative implications of the glorification of self-interest. Even though Castells is critical of expanding individualism he still celebrates the Silicon Valley entrepreneur.[260] While Bell was aware of the primacy of self-interest and rampant individualism in capitalism, he incorrectly assumed that such tendencies would weaken rather than strengthen in post-industrial society.[261] Bell and Castells' failure to appreciate the perils of individualism are particularly problematic given Schumpeter's views on the subject in which he correlates the rise of capitalism with the spirit of rationalist individualism.[262] Yet he goes further arguing that capitalism's gift to the peasant is the "individualist rope he needed in order to hang himself."[263] The perils of self-interest were not lost on other prominent sociologists. Weber was aware that early 20th century capitalism's emphasis on individualism and self-interest limited the potential for selfless entrepreneurs such as Franklin.[264] Veblen was highly critical of the invidious nature of self-interest and the dangers of pecuniary emulation – the desire to rival and surpass

others in wealth or status.[265] More recent critical scholarship from a range of voices has identified numerous dangers in rampant individualism. Dan Schiller notes that individualism facilitates capital accumulation by promoting consumption.[266] Harvey argues the focus on individualism creates an effective barrier to forming meaningful social solidarities,[267] while Giddens claims neoliberalism's continued focus on marketization and individualism undermines traditional values and institutions.[268] The accentuation of individualism and personal rights creates a powerful though not insurmountable ideological shield for neoliberalism as many oppositional forces often emphasize the value of individualism.[269] Because of the strong positive connotation of innovation, it is employed in information society discourse as a guise to hide the underlying neoliberal policies, with expansionary IP policy being a central policy plank. Extolling IP as an incentive of "outstanding significance" [270] occurs not because it is (a claim that the empirical evidence does not support), but rather because it serves the neoliberal logic of increased commodification and exclusionary property rights. Alternatives are all too often marginalized not because they are ineffective – the success of FOSS and OA demonstrate that they can be effective – but because they oppose the logic of privatization and individualism. While innovation possesses great potential to improve the human condition and generate real progress, through the confluence of neoliberalism, information age rhetoric, and neoclassical economic logic it has been pressed into the service of the relentlessly self-interested society.

The coopting of innovation rhetoric to serve the neoliberal policy agenda does not diminish the potential of innovation. It is crucial to note that the neoliberal mindset and its focus on efficiency, individualism, entrepreneurialism and limited government is itself an innovation in social norms. In the same way that Schumpeter's perennial gale can relegate giant corporations to the dustbin of history, innovation in social norms can resuscitate the Enlightenment ideal of encouraging innovation to advance political, social, moral and economic progress. It is in this regard that substantive alternatives to IP have their greatest potential. Substantive alternatives can and should be promoted because they rely on a range of incentive structures and encourage innovation without limiting access, but their most important contribution is advancing an ideological and normative viewpoint that values progressive social change, inclusion and cooperation rather than

commodification, exclusion and the self-interested pursuit of profit.

With the three facets of the framework for analyzing alternatives to IP complete, this study now examines its two case studies. The first case is the SAC's proposal for a monthly fee on internet access to license non-commercial file sharing, and the second case is defensive publishing. Each case study will be examined through the three facets - incentives structures, innovatory outcomes and ideological characteristics. Following the analysis of the case studies the dissertation concludes with an assessment of alternatives to IP and policy recommendations.

Notes to Chapter Six:

[1] Brian Kahin and Christopher T. Hill, "United States: The Need for Continuity," *Issues in Science and Technology*, 23(3), (2010), 51.
[2] OECD, *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*, (Paris, OECD: 2010), 11.
[3] Bronwyn Hall and John Van Reenen, "How Effective are Fiscal Incentives for R&D? A Review of the Evidence," *Research Policy*, 29, (2000), 450.
[4] OECD, *The OECD Innovation Strategy*, 19; and OECD, *Oslo Manual*, 32.
[5] Kahin and Till, "The United States," 59; and, OECD, *The OECD Innovation Strategy*, 11, and 113.
[6] OECD, *Oslo Manual*, 28.
[7] Alan Hughes, "Innovation Policy as Cargo Cult: Myth and Reality in Knowledge-Led Productivity Growth," in *Creating Wealth from Knowledge*, John Bessant and Tim Venables, (eds.), (Cheltenham, UK: Edward Elgar, 2008), 82.
[8] OECD, *The OECD Innovation Strategy*, 17.
[9] Kahin and Till, "The United States," 54.
[10] United States - National Economic Council, *A Strategy for American Innovation.*
[11] United States - National Economic Council, *A Strategy for American Innovation*, 4.
[12] United States - National Economic Council, *A Strategy for American Innovation*, 15.
[13] United States - National Economic Council, *A Strategy for American Innovation*, i-iii.
[14] National Economic Council, *A Strategy for American Innovation*, 6.
[15] United States – White House, *A New Generation of American Innovation*, (2004): http://georgewbush-whitehouse.archives.gov/infocus/technology/economic_policy200404/toc.html
[16] Kahin and Till, "The United States," 56, and 59.
[17] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*.
[18] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*, 9-10.
[19] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*, 11-12; United States – General Services Administration, "Challenge.gov - Frequently Asked Questions," (n.d.), http://challenge.gov/faq
[20] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*, 2, and 42.
[21] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*, 44.
[22] United States – National Economic Council, *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*, 44.
[23] See chap. 5, s. III.D.ii.

[24] United States – NIH, "NIH Fiscal Policy for Grant Awards – FY 2011," (2011): http://grants.nih.gov/grants/guide/notice-files/NOT-OD-11-068.html
[25] United States – Data.gov, "About," (n.d.): http://www.data.gov/about
[26] NIH, "NIH Fiscal Policy for Grant Awards – FY 2011."
[27] Ed O'Keefe, "Budget Could Close Door on Open Government," *The Washington Post*, (14 Apr. 2011): http://www.washingtonpost.com/blogs/federal-eye/post/budget-could-close-the-door-on-open-government/2011/04/13/AFttdXbD_blog.html?wpisrc=nl_fedinsider
[28] *Federal Research Public Access Act* (2006), S 2695, 109th Congress 2nd Sess., s. 4 (not passed).
[29] Suber, "Open Access in the USA," 158.
[30] United States – Library of Congress, "Bill Summary and Status 109th Congress (2005-2006) S 2695: All Information," (n.d.): http://thomas.loc.gov/cgi-bin/bdquery/z?d109:SN02695:@@@L&summ2=m&
[31] Library of Congress, "Bill Summary and Status 111th Congress (2009-2010) S. 1373: All Information," (n.d.): http://thomas.loc.gov/cgi-bin/bdquery/z?d111:SN01373:@@@L&summ2=m& ; Library of Congress, "Bill Summary and Status 111th Congress (2009-2010) H.R. 5037: All Information," (n.d.): http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR05037:@@@L&summ2=m& ; and, Library of Congress, "Bill Summary and Status 111th Congress (2009-2010) H.R. 5253: All Information," (n.d.): http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR05253:@@@L&summ2=m&
[32] *Research Works Act, (2011)*, HR 3699, 112th Cong, 1st Sess., s. 2, (16 Dec., 2011).
[33] Library of Congress, "Bill Summary and Status 111th Congress, (2009-2010) H.R. 801: All Information," (n.d.): http://thomas.loc.gov/cgi-bin/bdquery/z?d111:H.R.801: ; and, Library of Congress, "Bill Summary and Status 110th Congress, (2007-2008) H.R. 6845: All Information," (n.d.): http://thomas.loc.gov/cgi-bin/bdquery/z?d110:H.R.6845:
[34] Canada, *Innovation Canada: A Call to Action*, Review of Federal Support to Research and Development – Expert Panel Report, (2011): http://rd-review.ca/eic/site/033.nsf/vwapj/R-D_InnovationCanada_Final-eng.pdf/$FILE/R-D_InnovationCanada_Final-eng.pdf ; Canada, *Compete to Win: Final Report*, Competition Policy Review Panel, (2008): http://www.ic.gc.ca/eic/site/cprp-gepmc.nsf/vwapj/Compete_to_Win.pdf/$FILE/Compete_to_Win.pdf ; Council of Canadian Academies, *Innovation and Business Strategy: Why Canada Falls Short*, (2009): http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/inno/(2009-06-11)%20innovation%20report.pdf ; Canadian International Council, *Rights and Rents: Why Canada Must Harness Its Intellectual Property Resources*, (2011): http://www.opencanada.org/wp-content/uploads/2011/10/CIC-IP-Report-2011.pdf ; Tijs Creutzberg, *Canada's Innovation Underperformance: Whose Policy Problem Is It?* (2011): http://www.mowatcentre.ca/pdfs/mowatResearch/36.pdf ; Stratford Institute for Digital Media, *The Stratford Report 2011*, (2011): http://www.canada30.com/TheStratfordReport.pdf ; and, Canada – Science, Technology and Innovation Council. 2011. *State of the Nation 2010*.
[35] Barrie McKenna, "Canada's Missing R&D Ecosystem," *The Globe and Mail*, (13 Nov. 2011): http://www.theglobeandmail.com/report-on-business/commentary/barrie-mckenna/canadas-missing-rd-ecosystem/article2234944/ ; Kevin Van Paassen, "Canada Must Change Its Innovation Ecosystem," *The Globe and Mail*, (16 Nov. 2011): http://www.theglobeandmail.com/report-on-business/international-news/global-exchange/international-roundup/canada-must-change-its-innovation-ecosystem/article2236983/ ; Barrie McKenna, "Time for Action on Innovation, Not More Study," *The Globe and Mail*, (3 July 2011): http://www.theglobeandmail.com/report-on-business/commentary/barrie-mckenna/time-for-action-on-innovation-not-more-study/article2084968/ ; Barrie McKenna, "Canada's Innovation Window of Opportunity," *The Globe and Mail*, (19 Nov. 2011): http://www.theglobeandmail.com/report-on-business/economy/canadas-innovation-window-of-opportunity/article2242078/ ; and, Polushin, "Canada Must Change Its Innovation Ecosystem."
[36] National Research Council Canada, "About the NRC Industrial Research Assistance Program," (2011): http://www.nrc-cnrc.gc.ca/eng/ibp/irap/about/index.html ; and, National Research Council Canada, "Our Mandate," (2010): http://www.nrc-cnrc.gc.ca/eng/about/mandate.html
[37] National Research Council Canada, "Canada's Technology Clusters," (2010): http://www.nrc-cnrc.gc.ca/eng/clusters/index.html
[38] Emily Chung, "Video Game Subsidy Battle Heats Up," *CBC News* (14 Sept. 2010): http://www.cbc.ca/news/technology/story/2010/09/08/video-game-incentives-subsidies.html

[39] Jesse Brown, "Grand Theft Tax Break," *Macleans*, (13 Sept. 2011): http://www2.macleans.ca/2011/09/13/grand-theft-tax-break/ ; David Kocieniewski, "Rich Tax Breaks Bolster Makers of Video Games," *The New York Times*, (10 Sept. 2011): http://www.nytimes.com/2011/09/11/technology/rich-tax-breaks-bolster-video-game-makers.html?_r=1&scp=4&sq=video%20games&st=cse

[40] Canada Foundation for Innovation, "CFI Overview," (2010): http://www.innovation.ca/en/about-the-cfi/cfi-overview

[41] Canada Revenue Agency. "What is the SR&ED Program?" (2009): http://www.cra-arc.gc.ca/txcrdt/sred-rsde/bts-eng.html ; Hall and Reenen, "How Effective are Fiscal Incentives for R&D," 454.

[42] Canada - Science, Technology and Innovation Council, *State of the Nation 2010 – Canada's Science , Technology and Innovation System: State of the Nation 2010*, (2011), 17: http://www.stic-csti.ca/eic/site/stic-csti.nsf/vwapj/10-059_IC_SotN_Rapport_EN_WEB_INTERACTIVE.pdf/$FILE/10-059_IC_SotN_Rapport_EN_WEB_INTERACTIVE.pdf

[43] Barrie McKenna, "Dubious Claims Diminish R&D Tax Credit," *CTV News*, (2011): http://www.ctv.ca/generic/generated/static/business/article1896434.html

[44] McKenna, "Dubious Claims Diminish R&D Tax Credit."

[45] Barrie McKenna, "Flawed R&D Scheme Costs Taxpayers Billions," *The Globe and Mail*, (27 Apr. 2011): http://www.theglobeandmail.com/report-on-business/flawed-rd-scheme-costs-taxpayers-billions/article1939418/

[46] *Constitution Act, 1867* (UK), 30 & 31 Vict, c. 3, s. 93, reprinted in RSC 1985, App II No. 5.

[47] Department of Finance Canada and Revenue Canada. *The Federal System of Income Tax Incentives for Scientific Research and Experimental Development: Evaluation Report*, (1996), vi: http://www.collectionscanada.gc.ca/webarchives/20071127091048/http://www.fin.gc.ca/resdev/fedsys_e.pdf

[48] Canada, *Mobilizing Science and Technology to Canada's Advantage*, (2007), 9, and 24-25: http://www.ic.gc.ca/eic/site/ic1.nsf/vwapj/SandTstrategy.pdf/$file/SandTstrategy.pdf

[49] Canada, *Mobilizing Science and Technology to Canada's Advantage*, 52.

[50] Canada, *Mobilizing Science and Technology to Canada's Advantage*, 52.

[51] Canada, *Mobilizing Science and Technology to Canada's Advantage*, 2, and 3.

[52] Canada, *Improving Canada's Digital Advantage*.

[53] Canada, *Improving Canada's Digital Advantage*, 8. 30.

[54] Canada, *Improving Canada's Digital Advantage*, 9.

[55] Canada, "Open Data Pilot Project," (2012): http://www.data.gc.ca/default.asp?lang=En&n=F9B7A1E3-1

[56] James Moore, as quoted in, Canada, *Improving Canada's Digital Advantage*, 7.

[57] Canada, *Improving Canada's Digital Advantage*, 28.

[58] Canada, *Improving Canada's Digital Advantage*, 28, emphasis added by the author.

[59] Canada, *Speech from the Throne: Here for All Canadians*, (3 June 2011), 4: http://www.speech.gc.ca/local_grfx/docs/sft-ddt-2011_e.pdf ; and, Industry Canada, "Minister Paradis Reaffirms Commitment to Canada's Digital Economy," (2011): http://www.ic.gc.ca/eic/site/ic1.nsf/eng/06506.html

[60] Canada, "Open Data Pilot Project."

[61] United States –Advisory Committee on Measuring Innovation in the 21st Century Economy, *Innovation Measurement*, x.

[62] Jeremy A. Klein, "Innovation as Discourse," paper presented at the annual meeting of the International Association for Management of Technology (IAMOT), (Mar. 19, 2001), Lausanne, Switzerland: http://www.iamot.org/conference/index.php/ocs/7/paper/viewFile/830/280

[63] A search of OCLC's WorldCat reveals that at least six different books have been written with the title "Innovate or Die" (OCLC, *WorldCat*, (2011): http://www.worldcat.org/).

[64] See chap. 5 s. II.C.i.

[65] Everett M. Rogers, *Diffusion of Innovations*, 5th ed., (New York: Free Press, 2003), 106.

[66] Rogers, *Diffusion of Innovations*, 110.

[67] See chap. 4 s. I.A.i.

[68] Boyle, *Shamans, Software and Spleens*, 16; Arewa, *Copyright on Catfish Row*, 335.

[69] Arewa, *Copyright on Catfish Row*, 301, and 304-05.

[70] Boyle, *Shamans, Software and Spleens*, 126.
[71] Cormac Sheridan, "EPO Neem Patent Revocation Revives Biopiracy Debate," *Nature Biotechnology*, 23, (2005), 511.
[72] Rogers, *Diffusion of Innovations*, 107.
[73] United States - Centers for Disease Control, *Policy Impact: Prescription Painkiller Overdoses*, (2011), [4]: http://www.cdc.gov/homeandrecreationalsafety/pdf/PolicyImpact-PrescriptionPainkillerOD.pdf
[74] Rogers, *Diffusion of Innovations*, 117-18, and 437-39.
[75] Rogers, *Diffusion of Innovations*, 130, and 457.
[76] Rogers, *Diffusion of Innovations*, 130.
[77] Theodore Roszak, *The Cult of Information*, 2nd ed., (Berkeley, CA: University of California Press, 1996), 19.
[78] George W. Downs, Jr. and Lawrence B. Mohr, "Conceptual Issues in the Study of Innovation," *Administrative Science Quarterly*, 21(4), (1976), 700.
[79] Klein, "Innovation as Discourse."
[80] Bronk, *Progress and the Invisible Hand*, 6-7.
[81] Bronk, *Progress and the Invisible Hand*, 49; and, Leo Marx, "Does Improved Technology Mean Progress?," in *Technology and the Future*, Alberft Teich (ed.), (Belmont, CA: Wadsworth, 2003), 5.
[82] Bronk, *Progress and the Invisible Hand*, 49.
[83] Antoine-Nicolas de Condorcet, *Sketch for a Historical Picture of the Progress of the Human Mind*, June Barraclough (trans.,), (Westport, CN: Greenwood Press, 1955), 175.
[84] Condorcet, *Sketch for a Historical Picture of the Progress of the Human Mind*, 188-89.
[85] Bronk, *Progress and the Invisible Hand*, 50; and, Robert Nisbet, *History of the Idea of Progress*, (New York: Basic Books, 1980), 207.
[86] Nisbet, *History of the Idea of Progress*, 179, and 213; and Marx, "Does Improved Technology Mean Progress?" 5.
[87] Machlup and Penrose, "The Patent Controversy of the 19th Century, " 4 n. 8, and 15
[88] "Amendment to the Patent Laws," *The Economist*, (26 July 1851), 4.
[89] Nisbet, *History of the Idea of Progress*, 194.
[90] Alexis de Tocqueville, *Democracy in America*, J.P. Mayer (ed.), George Lawrence (trans.), (New York: Harper Perennial, 1988), 453-54.
[91] Benjamin Franklin, *Memoirs of the Life and Writings of Benjamin Franklin*, (London: J.M. Dent and Sons, 1913), 140; and, Marx, "Does Improved Technology Mean Progress?," 5-6.
[92] Thomas Jefferson, "To Issac McPherson: Monticello, August 13, 1813," in *Jefferson: Political Writings*, Joyce Appleby and Terence Ball (eds.), (Cambridge: Cambridge University Press, 1999), 580.
[93] Jefferson, To Issac McPherson," 580.
[94] Justin Hughes, "Copyright and Incomplete Historiographies: Of Piracy, Propertization and Thomas Jefferson," *Southern California Law Review*, 79, (2006), 1027; Edward C. Walterscheid, "To Promote the Progress of Science and the Useful Arts: The Anatomy of a Congressional Power," *IDEA – The Journal of Law and Technology*, 43(1), (2002), 9-12.
[95] Malla Pollack, "What is Congress Supposed to Promote?: Defining 'Progress' in Article I, Section 8, Clause 8 of the United States Constitution, or Introducing the Progress Clause," *Nebraska Law Review*, 80, (2001), 755, and 757-58; and, Vivian J. Fong, "Are We Making Progress?: The Constitution as a Touchstone for Creating Consistent Patent Law and Policy," *University of Pennsylvania Journal of Constitutional Law*, 11, (2009): 1164-65; Dotan Oliar, "Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress's Intellectual Property Power," *Georgetown Law Journal*, 94, (2006), 1808 ; and, Walterscheid, "To Promote the Progress of Science and the Useful Arts: The Anatomy," 10-12.
[96] Pollak, "What is Congress Supposed to Promote?" 766, and 770-71.
[97] *Eldred v. Ashcroft*, 537 U.S. 6 (2003).
[98] *Pennock & Sellers v. Dialogue*, 27 U.S. 1 (1829) at 19.
[99] For example see: *Fox Film Corp. v. Doyal*, 286 U.S. 123 (1932) at 127; *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966) at 6 and 8-9; *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151 (1975) at 156; and, *Feist Publications Inc., v. Rural Telephone Service Company Inc*., 499 U.S. 340 (1991) at 349.
[100] The term 'progress' is not entirely foreign to Canadian IP law. Both Lower Canada and Upper Canada had patent statutes entitled "An Act to Promote the Progress of the Useful Arts," but the requirement that IP

laws must serve progress is not part of Canadian law (*Harvard College v. Canada (Commissioner of Patents)*, [2002] 4 SCR 45, 2002 SCC 76, at para. 40).

[101] Marx, "Does Improved Technology Mean Progress?" 4.

[102] Robert Hassan, *The Information Society*, (Cambridge: Polity, 2008), 34.

[103] Marx, "Does Improved Technology Mean Progress?" 6.

[104] Marx, "Does Improved Technology Mean Progress?" 7.

[105] Nisbet, *History of the Idea of Progress*, 204-05.

[106] Marx, "Does Improved Technology Mean Progress?" 8.

[107] Marx, "Does Improved Technology Mean Progress?" 4, and 8; and, Bronk, *Progress and the Invisible Hand*, 9, and 81.

[108] Nisbet, *History of the Idea of Progress*, 177; and, Bronk, *Progress and the Invisible Hand*, 6-7.

[109] See chap. 5, s. II.A

[110] Roszak, *The Cult of Information*, 44; David Harvey, *The Enigma of Capital*, (Oxford: Oxford University Press, 2010), 88; Ronald Wright, *A Short History of Progress*, (Toronto: Anansi, 2004), 4.

[111] David Harvey, The Limits to Capital, (London: Verso, 2006), 122.

[112] Carlaw et al., "Beyond the Hype," 637; and, Donald McL. Lamberton, "The Knowledge Based Economy: Better Living or Bigger Profits," in *Innovation, Economic Progress and the Quality of Life*, Gerry Sweeney (ed.), (Cheltenham, UK: Edward Elgar, 2001), 112.

[113] Wright, *A Short History of Progress*, 5.

[114] Michael H. Harris, Stan A Hannah and Pamela C. Harris, *Into the Future: The Foundation of Library and Information Science in a Post-Industrial Era*, 2nd ed., (Greenwich, CN: Ablex, 1998), 14.

[115] Margaret Archer, "Theory Culture and Post-Industrial Society," in *Global Culture: Nationalism, Globalization and Modernity*, Mike Featherstone (ed.), (London: Sage, 1990), 111.

[116] Roszak, *The Cult of Information*, 16.

[117] Hassan, *The Information Society*, 69, and 220.

[118] Bronk, *Progress and the Invisible Hand*, 169-70.

[119] Bronk, *Progress and the Invisible Hand*, 17.

[120] Bronk, *Progress and the Invisible Hand*, 169; Harvey, *The Enigma of Capital*, 14 and 60.

[121] William Polushin, "Canada Must Change Its Innovation Ecosystem," *The Globe and Mail*, (16 Nov. 2011.): http://www.theglobeandmail.com/report-on-business/international-news/global-exchange/international-roundup/canada-must-change-its-innovation-ecosystem/article2236983/

[122] USPTO, "About USPTO," (2011): http://www.uspto.gov/about/index.jsp ; and, USPTO, *The 21st Century Strategic Plan*, (2003), 2: http://www.uspto.gov/web/offices/com/strat21/stratplan_03feb2003.pdf

[123] USPTO, *2010-2015 Strategic Plan*, (2010), 2-3: http://www.uspto.gov/about/stratplan/USPTO_2010-2015_Strategic_Plan.pdf

[124] USPTO, *2010-2015 Strategic Plan*, 46-56.

[125] CIPO, "Vision, Mission and Values," (2011): http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr00444.html

[126] WIPO, "What is WIPO."

[127] Convention Establishing the World Intellectual Property Organization, July 14, 1967, amended Sept. 28, 1979, 828 UNTS 3.

[128] Hargreaves, *Digital Opportunity*, 1.

[129] For example the Centre for American Progress places central emphasis on the improvement of the human condition as the primary purpose of progress and has compiled a whole book on the subject (Jonathan D. Moreno, "Science Progress, the Phrase and the Title," *Center for American Progress*, (4 Oct., 1997): http://www.americanprogress.org/issues/2007/10/science_progress.html ; and, Jonathan D. Moreno and Rick Weiss, "Introduction: Time for Science to Reclaim Its Progressive Roots," in *Science Next: Innovation from the Common Good from the Center for American Progress*, Jonathan D. Moreno and Rick Weiss (eds.), (New York: Bellevue Literary Press, 2009), 14).

[130] OECD, *Ministerial Report on the OECD Innovation Strategy: Key Findings*, (2010), 4: http://www.oecd.org/dataoecd/51/28/45326349.pdf

[131] OECD, *Ministerial Report on the OECD Innovation Strategy*, 6.

[132] World Health Organization (WHO), *Public Health: Innovation and Intellectual Property Rights*, (2006), 21: http://www.who.int/intellectualproperty/documents/thereport/CIPIH23032006.pdf

[133] WTO, "Declaration on the TRIPS Agreement and Public Health," (14 Nov. 2001): http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm
[134] WIPO Standing Committee on the Law of Patents, *Report on the International Patent System*, 79.
[135] Bronk, *Progress and the Invisible Hand*, 90, and 95.
[136] Bronk, *Progress and the Invisible Hand*, 222.
[137] See chap. 5, s. I, A.
[138] Romer, "When Should We Use Intellectual Property Rights?" 215.
[139] Gerry Sweeney, "Introduction: Innovation and Innovation Policy: The Need for Re-examination," in *Innovation, Economic Progress and the Quality of Life*, Gerry Sweeney (ed.), (Cheltenham, UK: Edward Elgar, 2001), 19.
[140] Bronk, *Progress and the Invisible Hand*, 164.
[141] Schumpeter, Capitalism, Socialism and Democracy, 67.
[142] Bronk, *Progress and the Invisible Hand*, 168.
[143] Lamberton, "The Knowledge Based Economy," 111.
[144] Du Pont, "Better Things…: 1939," (2011): http://www2.dupont.com/Heritage/en_US/1939_dupont/1939_indepth.html
[145] Bronk, *Progress and the Invisible Hand*, xvi-xvii.
[146] Roszak, *The Cult of Information*, 19.
[147] David S. Owen, *Between Reason and History: Habermas and the Idea of Progress*, (Albany, NY: State University of New York Press, 2002), 21 and 179.
[148] Owen, *Between Reason and History*, 179-80.
[149] Owen, *Between Reason and History*, 182.
[150] Wright, *A Short History of Progress*, 4-5.
[151] Bronk, *Progress and the Invisible Hand*, xii.
[152] Carlaw et al. identify 22 different names for the information society (Carlaw et al., "Beyond the Hype," 669-690.
[153] Alvin Toffler, *The Third Wave*, (New York: William Morrow, 1980), 164.
[154] For a detailed comparison of various information society theories see Webster, *Theories of the Information Society*.
[155] Webster, *Theories of the Information Society*, 31; Hassan, *The Information Society*, 52; and, Bell, *The Coming of Postindustrial Society*, ix-x.
[156] Both Castells and Harvey appear on the top ten list as well ("Relative Ranking of a Selected Pool of Leading Scholars in the Social Sciences by Number of Citations in the Social Science Citation Index, 2000-2009," (n.d.): http://www.manuelcastells.info/en/SSCIsocialranking_eng.pdf).
[157] Bell, *The Coming of Postindustrial Society*, 20 and 25.
[158] Bell, *The Coming of Postindustrial Society*, 20, and 26; Daniel Bell, "The Social Framework of the Information Society," in *The Microelectronics Revolution: The Complete Guide to the New Technology and Its Impacts on Society*, Tom Forester, (ed.), (Oxford: Basil Blackwell, 1980), 501.
[159] Bell, *The Coming of Postindustrial Society*, 35.
[160] Bell, *The Coming of Postindustrial Society*, 176; and Bell, "The Social Fabric of the Information Society," 537.
[161] Bell, "The Social Fabric of the Information Society," 512.
[162] Bell, *The Coming of Postindustrial Society*, 79.
[163] Bell, "The Social Fabric of the Information Society," 515.
[164] Dan Schiller, "The Information Commodity: A Preliminary View," *in Cutting Edge: Technology, Information Capitalism and Social Revolution*, Jim Davis, Thomas A. Hirschl and Michael Stack (eds.), (London: Verso, 1997), 105-106.
[165] Webster, *Theories of the Information Society*, 47-49, and 52.
[166] Webster, *Theories of the Information Society*, 59 (emphasis in the original).
[167] Webster, *Theories of the Information Society*, 41, and 43.
[168] Bell, *The Coming of Postindustrial Society*, xviii.
[169] Bell, *The Coming of Postindustrial Society*, 189.
[170] Bell, *The Coming of Postindustrial Society*, 189.
[171] Bell, *The Coming of Postindustrial Society*, 189.
[172] Bell, *The Coming of Postindustrial Society*, 197.

[173] Bell, "The Social Fabric of the Information Society," 505.
[174] Bell, *The Coming of Postindustrial Society*, 362, and 374.
[175] Nicholas Garnham, "'Information Society' as Theory or Ideology: A Critical Perspective on Technology, Education and Employment in the Information Age," *Information, Communication and Society*, 3(2), (2000), 142.
[176] Harris, Hannah and Harris, *Into the Future*, 11.
[177] Harris, Hannah and Harris, *Into the Future*, 24.
[178] Dan Schiller, *How to Think about Information*, (Urbana, IL: University of Illinois Press, 2007), 20; and Webster, *Theories of the Information Society*, 38.
[179] Harris, Hannah and Harris, *Into the Future*, 4.
[180] Castells, *The Rise of the Network Society*, 218-19.
[181] Webster, *Theories of the Information Society*, 98, and 265.
[182] Castells, *The Internet Galaxy*, 100.
[183] Castells, *The Internet Galaxy*, 56.
[184] Castells, *The Internet Galaxy*, 56.
[185] Castells, *The Rise of the Network Society*, 215.
[186] Schumpeter, Capitalism, Socialism and Democracy, 84.
[187] Castells, *The Internet Galaxy*, 56.
[188] Castells, *The Internet Galaxy*, 58-59; Manuel Castells and Martin Ince, *Conversations with Manuel Castells*, (Cambridge: Polity, 2003), 37
[189] Castells, *The Internet Galaxy*, 59.
[190] Castells, *The Internet Galaxy*, 276, and 278.
[191] Castells, *The Rise of the Network Society*, 143-44.
[192] Felix Stalder, *Manuel Castells: The Theory of the Network Society*, (Cambridge: Polity, 2006), 204.
[193] Castells, *The Rise of the Network Society*, 258.
[194] Castells, *The Internet Galaxy*, 103-04.
[195] Castells, *The Power of Identity*, 2nd ed., 363.
[196] Castells, *The Rise of the Network Society*, 114 and 120 .
[197] Garnham, "'Information Society' as Theory or Ideology," 147.
[198] Castells, *The Internet Galaxy*, 100.
[199] Castells and Ince, *Conversations with Manuel Castells*, 54.
[200] Castells, *The Internet Galaxy*, 182.
[201] Manuel Castells, "The Cultures of the Internet," *Queen's Quarterly*, 109(3), (2002), 341-42.
[202] Manuel Castells, "The Network Society: From Knowledge to Policy," in *The Network Society: From Knowledge to Policy*, Manuel Castells and Gustavo Cardoso (eds.), (Washington, DC: John Hopkins Center for Transatlantic Relations, 2005), 19 (emphasis in the original).
[203] Castells, *The Internet Galaxy*, 56.
[204] Castells, *The Internet Galaxy*, 57-58; Castells and Ince, *Conversations with Manuel Castells*, 37
[205] Castells, *The Internet Galaxy*, 100, and 104.
[206] Webster, *Theories of the Information Society*, 121.
[207] Castells, *The Rise of the Network Society*, 259.
[208] Castells, *The Rise of the Network Society*, 5.
[209] Webster, *Theories of the Information Society*, 116.
[210] Castells, *The Internet Galaxy*, 103.
[211] Garnham, "'Information Society' as Theory or Ideology," 143-144.
[212] Bell, *The Coming of Postindustrial Society*, xxiv.
[213] Webster, Theories of the Information Society, 98, and 265; and, Hassan, *The Information Society*, 93.
[214] Castells, *The Rise of the Network Society*, 215.
[215] Harvey, *The Limits to Capital*, xv.
[216] Harvey, *A Brief History of Neoliberalism*, 190.
[217] Castells, *The Internet Galaxy*, 105.
[218] Harvey, *The Condition of Postmodernity*, 111.
[219] Harvey, *The Enigma of Capital*, 92
[220] Harvey, *A Brief History of Neoliberalism*, 156.
[221] Harvey, *The Condition of Postmodernity*, 27, and 106.

[222] Harvey, *The Enigma of Capital*, 41-42, and 158.
[223] Harvey, *The Condition of Postmodernity*, 106.
[224] Harvey, *The Condition of Postmodernity*, 103.
[225] Harvey, *The Condition of Postmodernity*, 105; Harvey, *The Limits to Capital*, xxiv; Harvey, *The Enigma of Capital*, 14, and 59.
[226] Harvey, *The Enigma of Capital*, 93.
[227] Harvey, *The Condition of Postmodernity*, 17; Harvey, *The Enigma of Capital*, 46.
[228] Harvey, *The Limits to Capital*, 121.
[229] Harvey, *A Brief History of Neoliberalism*, 157, and 159.
[230] Harvey, *The Enigma of Capital*, 34; Harvey, *The Limits to Capital*, xv,
[231] Harvey, *The Condition of Postmodernity*, 285; and Harvey, *The Enigma of Capital*, 262.
[232] Harvey, *The Enigma of Capital*, 262.
[233] World Bank, "GDP (Current US$)," (2011): http://data.worldbank.org/indicator/NY.GDP.MKTP.CD
[234] Harvey, *The Enigma of Capital*, 29.
[235] In particular he warns of future speculative bubbles in biotechnology and genetic engineering (Harvey, *The Enigma of Capital*, 97-98).
[236] Harvey, *The Enigma of Capital*, 73.
[237] Harvey, *The Enigma of Capital*, 144.
[238] Harvey, *The Limits to Capital*, xvi.
[239] Harvey, *The Limits to Capital*, 123.
[240] David Harvey, *Spaces of Global Capitalism*, (London: Verso, 2006), 43; and, Harvey, *A Brief History of Neoliberalism*, 159.
[241] Harvey, *Spaces of Global Capitalism*, 44.
[242] Harvey, *A Brief History of Neoliberalism*, 166.
[243] Harvey, *The Enigma of Capital*, 221.
[244] Harvey, *A Brief History of Neoliberalism*, 159, and 161.
[245] Harvey, *The Enigma of Capital*, 231.
[246] Harvey, *The Condition of Postmodernity*, 111.
[247] May, *A Global Political Economy of Intellectual Property Rights*, 166.
[248] Harvey, *Spaces of Global Capitalism*, 25.
[249] May, *A Global Political Economy of Intellectual Property Rights*, 164; Trosow, "The Ownership and Commodification of Legal Knowledge," 418; and, Boyle, "Fencing off Ideas," 24.
[250] May, *A Global Political Economy of Intellectual Property Rights*, 165.
[251] May, *A Global Political Economy of Intellectual Property Rights*, 166; and, Harvey, *Spaces of Global Capitalism*, 25.
[252] Dyer-Witheford, *Cyber-Marx*, 22.
[253] Harris, Hannah and Harris, *Into the Future*, 58.
[254] William H. Dutton, "Introduction," in *Information and Communications Technologies: Visions and Realities*, William H. Dutton (ed.), (Oxford: Oxford University Press, 1996), 15.
[255] United States – Department of Commerce – Information Infrastructure Task Force, *The National Information Infrastructure: Agenda for Action*, (1993), 7: http://www.eric.ed.gov/PDFS/ED364215.pdf
[256] United States – Information Infrastructure Task Force, *The National Information Infrastructure*, 12.
[257] Pyati, "WSIS: Whose Vision of an Information Society?"
[258] George Lakoff, *The Political Mind: Why You Can't Understand 21st-Century Politics with an 18th-Century Brain*, (New York: Viking, 2008), 56.
[259] Hassan *The Information Society*, 67.
[260] Castells, The Internet Galaxy, 59-60, and 278.
[261] Bell, *The Coming of Post-Industrial Society*, 481; Daniel Bell, *The Cultural Contradictions of Capitalism*, (New York: Basic Books, 1978), 144-145.
[262] Schumpeter, *Capitalism, Socialism and Democracy*, 124.
[263] Schumpeter, *Capitalism, Socialism and Democracy*, 139.
[264] Weber, *The Protestant Ethic and the Spirit of Capitalism*, 71-72.
[265] Thorstein Velben, *The Theory of The Leisure Class*, (New York: Dover, 1994).
[266] Schiller, *How to Think about Information*, 52.
[267] Harvey, *The Limits to Capital*, xiii.

[268] Anthony Giddens, *Beyond Left and Right: The Future of Radical Politics*, (Cambridge: Polity, 1994), 9.
[269] Harvey, *Spaces of Global Capitalism*, 50; Harvey, *The Enigma of Capital*, 178.
[270] WCT, Preamble.

Chapter Seven – Case Studies: The Songwriters Association of Canada ISP Proposal and Defensive Publishing as Alternatives to Intellectual Property

This chapter examines two case studies – the Songwriters Association of Canada's proposal for a monthly ISP fee to allow music file sharing as an alternative to copyright and defensive publishing as an alternative to patenting. The analysis of each case study follows the framework set out in the previous chapters and scrutinizes each alternative on the role of incentives, the prospects for innovative activity and the ideological elements. The final section of the chapter briefly contrasts the findings of the two case studies.

Building on the discussion in the three previous chapters, it is important to note that substantive alternatives should employ a range of incentive structures as a narrow reliance on direct pecuniary incentives is likely to engender a limited range of innovation. Substantive alternatives must also facilitate access to the resulting intellectual good or service or its informational content, unlike IP which relies on exclusionary rights. Finally, substantive alternatives should not embody the same ideological characteristics and normative viewpoints as IP. In this regard substantive alternatives must value innovation for more than narrow economic reasons. It is crucial that alternatives differ from IP in each of these three facets if they are to be substantive alternatives capable of addressing the problems of the expansionary IP regime.

I. The Songwriters Association of Canada ISP Levy Proposal

This case study examines the Songwriters Association of Canada proposal for a monthly fee on internet service providers (ISPs) that would license and monetize all forms of music file sharing. It begins by providing some context around the issue of online file sharing and a summary of the SAC's proposal before examining the incentive structures employed under the proposal, its ability to generate innovation, and the ideological dimensions of the proposal.

A. Overview

i. Historical Context

The SAC proposal to monetize file sharing occurs alongside a series of social, legal and technological changes stretching back slightly more than a decade that have dramatically altered the music industry both domestically and internationally. From a high point in the late 1990s the music industry has severely contracted losing nearly half of its total global value.[1] Most significant has been the decline in CD sales. In Canada in 1999, the industry shipped 58,353 CDs for a total sale value of $699,971 (CAD) representing nearly 92% of the industry's total sales.[2] Ten years later the volume of CDs shipped fell by more than 50% to 28,685 units worth only $289,604 (CAD). Although digital sales added another $89,398 to the industry in 2009 – a revenue source that did not exist ten years earlier – the overall sales of the industry totaled just 53% of their 1999 numbers.[3] The decline of the recording industry has occurred concurrently with the rise of the internet and file sharing. While illegal file sharing and other unauthorized forms of copyright infringement have affected all content industries, the music industry has been acutely impacted with the OECD identifying it as the content industry with the highest scope of unauthorized online downloading.[4] Because of their small file size, typically about 4MB per song in MP3 format, file sharing of songs has historically been much more popular than films and TV shows which are considerably larger.[5] Estimates suggest that up to 95% of online music downloads are done via unauthorized services or networks.[6] While the digital music market has expanded considerably totaling over 400 licensed download or streaming services globally and is now worth $4.6 billion, it has not been able to compensate for the decline in CD sales.[7] The sharp decline of fortunes in the recording industry has resulted in a range of business models and legal tactics that have attempted to stem the tide of illegal file sharing including the SAC's proposal.

ii. The Rise of File Sharing, the Success of Firm-Level Litigation and the Failure of John Doe Lawsuits

Since the 1950s a series of new and disruptive copying technologies have affected various intellectual goods producers and distributers. Publishers were initially fearful of

the danger posed by the photocopier, cassette tapes alarmed the music industry, and the movie industry attempted to quash the videocassette market in its infancy. However, these disruptive technologies were markedly different than the advent of peer-to-peer (P2P) file sharing. Photocopying and audio/video cassette recording produces imperfect copies, and often requires equipment that has traditionally been prohibitively expensive.[8] With P2P software, a computer and an internet connection individuals can gain access to extensive catalogues of content that can be downloaded with relative ease. Large scale P2P file sharing began in mid-1999 with launching of Napster.[9] Though the recording industry was successful in getting Napster shut down,[10] new services such as Grokster (which stopped offering file sharing services after a 2005 U.S. Supreme Court decision that held it was liable for third party infringement[11]), LimeWire (eventually ordered to stop facilitating file sharing in 2010[12]) and later BitTorrent have emerged to facilitate file sharing.[13]

Despite the increase in file sharing there is a lack of unequivocal empirical evidence that file sharing is actually to blame for the decline in the fortunes of the recording industry.[14] While some see file sharing as a substitute for purchasing music, others have argued that rather than a substitution effect file sharing produces a sampling effect whereby those downloading find out about new music that they may go on to purchase.[15] A 2007 study for Industry Canada revealed that persons engaged in file sharing tend to purchase more CDs than those who do not file share, and concluded that at the aggregate level there was no relationship between file sharing and CD sales.[16] Despite the lack of clear evidence on causation, the temporal correlation between file sharing and the decline of the recording industry has caused the content industries in general to take an extremely negative stance toward P2P technology.

The explosion of file sharing services did not go unnoticed by the recording industry. In 2001 the RIAA adopted a new approach to tackling the problem of online file sharing and it began litigating against firms that facilitated infringement. In 2003 the RIAA expanded its tactic with the controversial approach of suing individual file sharers,[17] a policy abandoned by the RIAA at the end of 2008.[18] In Canada the approach of litigating against individuals proved to be futile.[19] Ultimately the litigious approach to dealing with

online file sharing must be viewed as a failure. The RIAA only used the practice for five years, and such a strategy was never successful in Canada. The lack of success generated by individual law suits in stemming file sharing has underscored the importance of adopting alternative approaches. One of these alternatives is the SAC's proposal to monetize file sharing.

iii. Key Points of the SAC Proposal

The SAC's proposal has evolved since October 2007 when they first proposed a levy system to monetize file sharing.[20] The first SAC proposal from October 2007 would have compelled rights holders to participate. The initial proposal faced criticism that it would contravene the Berne Convention and TRIPS Agreement three step tests limiting exceptions to copyright. As a result the SAC revised its proposal in March 2009 to make rights holder and internet subscriber participation optional.[21] In April of 2010 Eddie Schwartz, President of the SAC, first proposed the idea of a voluntary licensing fee, as opposed to a levy, for ISPs in the range of $4-5 (CAD) per month.[22] In January 2011 the SAC altered their proposal changing it from a system designed around levies to a private ordering scheme whereby ISPs would partner with collective licensing agencies to allow file sharing, regardless of the specific platform used, in exchange for a monthly fee.[23] According to the SAC, because the current proposal is optional for rights holders, it is compliant with international copyright treaties.[24] The SAC is not the only group representing artist and creators that has proposed an ISP levy. In 2009, the Alliance of Canadian Cinema, Television and Radio Artists (ACTRA), the Directors Guild of Canada and the Writers Guild of Canada (WGC) proposed an ISP levy at the rate of 2.5% of broadband subscription revenues to help fund Canadian content.[25] Later in 2009 the WGC proposed a 1.5% ISP revenue levy to fund Canadian content.[26] In June of 2010 L'AGAMM (L'Accès Gratuit à la Musique est un Mythe), a coalition of music rights holders, proposed an ISP levy to compensate rights holders for file sharing losses.[27]

Although the SAC proposal has substantively changed from a levy scheme to a private ordering mechanism, the core of the proposal remains monetizing the sharing of music, though they are not proposing to add such a right to the economic rights of copyright set

out in section 3 of the *Copyright Act*.[28] The SAC proposal would allow ISPs that have partnered with rights holding record labels and music publishers to charge a monthly fee which in exchange would authorize the sharing of music in any manner so long as it was done for non-commercial purposes. Internet subscribers who wish to not pay the monthly fee could opt out if they declare that they do not share music, and rights holders would also be able to choose to participate or not. ISPs would be entitled to collect some percentage (which at this point has not been identified) and the remaining revenues would be split between performers, songwriters and rights holders.[29] At this point the SAC has still not identified the exact monthly fee, though they do suggest that a $10 (CAD) monthly fee would generate revenues roughly equal to the revenues earned by major record labels in Canada in 2000.[30] The proposal is technologically neutral allowing not only peer-to-peer file sharing, but also the copying of CDs for friends, emailing songs as attachments and even drive cloning.[31] The SAC also argues that rights holders are likely to participate as very few opt out of collective licensing schemes for fear of lost revenue.[32] In support of their proposal the SAC cites a study by the University of Hertfordshire that suggests that nearly three quarters of unauthorized file sharers are interested in having a legal file sharing service.[33]

The SAC proposal is comprised of seven key components which are:

1) **Private individuals and households who wish to music file-share would be licensed to do so in conjunction with an agreement to pay a reasonable monthly license fee.** The license would cover the private, noncommercial sharing of music, between two or more parties, using any Internet-based file-sharing client. A license fee differs fundamentally from a levy or tax in that consumers may opt out if they self-declare not to music file-share.

2) **Only those who wish to share copies of musical works without motive of financial gain would be covered by this license**. Parties who receive, or seek to receive financial compensation for file-sharing, or other commercial purpose, would not be covered, and would be required to obtain the appropriate licenses and/or approvals from those bodies who license commercial music use.

3) **Any Internet-based technology could be used for music file-sharing,** including current technologies such as torrents, social networking sites, etc., as well as new technologies as

they become available**. No behavior modification whatsoever is required on the part of the consumer.**

4) **Existing collectives would license consumers. License fees would be pooled and pro rata distributions based on non-intrusive data collection would be made to performers, songwriters, and rights holders**. Such data is already being accurately collected in regard to P2P file-sharing in a manner that ensures consumer privacy by companies such as Big Champagne based in California, and is currently used by both major record labels and movie distributors for marketing purposes.

5) **ISPs would partner with collectives in order to facilitate the licensing process. Access and content could be bundled.** The proposed license fee would appear as a line item on monthly Internet access statements sent to consumers by ISPs.

6) **ISPs may deduct a reasonable collection fee before forwarding net revenue to collectives for distribution to music creators and rights-holders.**

7) **Net revenues would be split between performers, songwriters, and rights-holders.** Any particular musical work would attract a pro rata share of the entire revenue pool based on the number of times that work was file-shared. Once that pro rata share was determined, the performer, songwriter, record label and music publisher would split that amount based on an agreed upon formula and contractual obligations.[34]

iv. SAC Proposal Criticisms and Shortcomings

The SAC's original proposal met with a fair degree of criticism. The Canadian Recording Industry Association (CRIA) declared the proposal a "pipe dream."[35] While the CRIA supports the private copying levy, they opposed extending Canada's existing levy system beyond private copying.[36] Unsurprisingly the original proposal was also dismissed by paid music download services as a threat to their new business models.[37] Prominent Canadian digital media scholar Michael Geist labeled the original SAC proposal "seriously flawed,"[38] though he described the 2009 revised levy proposal as an innovative new alternative.[39]

While the new proposal attempts to mitigate some of the problems with the previous levy based approach some issues still remain. The proposal is still incomplete, and key information such as the exact size of the monthly fee or the share of revenue the ISPs will

garner is still not clear. Despite the change in the SAC proposal the CRIA has remained critical noting that it has not been part of any discussions between the SAC and ISPs.[40] CRIA President Graham Henderson also notes that there are already services such as Rdio.com and Slacker Radio that allow people to listen to unlimited volumes of music for $5 (CAD) a month.[41] It should be noted that such services are streaming based and do not allow users to accumulate the music they listen to.[42] There are also concerns that the current plan, where consumers must opt out of the fee, may run afoul of consumer protection legislation that limits negative option billing.[43]

v. Arrangements Involving ISPs in Other Jurisdictions

The SAC's proposal for monetizing file sharing differs sharply from the agreements ISPs in other countries have formed with rights holding organizations. Increasingly ISPs are partnering with copyright holders in introducing 'graduated response' systems whereby individuals engaging in suspected infringing activities are given a series of educational notifications and warnings that eventually culminate in some sort of sanction.[44] France first initiated such a system in 2007, and since then countries including South Korea, Ireland, New Zealand and the U.K. have implemented or are nearing implementation of such systems.[45] In July 2011 ISPs AT&T, Cablevision Systems, Comcast, Time Warner Cable and Verizon announced that they were partnering with the MPAA, RIAA, Independent Film and Television Alliance (IFTA), and the American Association of Independent Music (A2IM) and these organizations constituent members to introduce a copyright alert system in the U.S.[46] Starting in late 2011 the system uses a six stage alert system that warns subscribers who are suspected of infringing activity with progressively more serious notifications. ISPs have at their discretion the ability to implement some sort of penalty on users for their fifth and sixth warnings. The alert system does not include a mechanism through which ISPs are entitled or obliged to terminate suspected infringers of copyright internet service; however, such a mechanism is provided by section 512 of the DMCA. The U.S. copyright alert system does not include any measure whereby ISPs provide a subscriber's personal information to rights holders.[47] Although no such system exists in Canada, the Creators' Copyright Coalition, of which the SAC is a member, is pushing for a graduated response system for ISPs.[48] In addition to graduated

alert systems there have been numerous deals struck between ISPs and rights holding organizations whereby ISPs either develop their own music streaming or downloading services or partner with existing services.[49]

Given the relative innovativeness of the SAC's proposal, it merits further examination as to what degree the proposal, if implemented, would represent an effective alternative to copyright. This examination begins with an investigation of the incentives used in the SAC proposal.

B. Incentives

The SAC proposal recognizes the diversity of motives and interests involved in music distribution and exchange, yet it also places primary emphasis on remuneration and pecuniary motives. The SAC suggests that their proposal is better suited to artists than more adversarial approaches (such as litigation) and claims that for aspiring and niche artists it offers an unprecedented distribution tool.[50] The SAC also contends that once file sharing is monetized artists will have new opportunities available to them but provides no specifics.[51]

For both ISPs and rights holders the proposal's primary incentive is pecuniary – additional revenue streams. It also argues that ISPs would have the ability to establish their own proprietary music sharing services that would decrease bandwidth costs and be a source of new value added services.[52]

Incenting ISP participation is a particularly important piece of the SAC proposal. While it is not yet clear what percentage of the monthly fee would go to ISPs, providing them with some of the revenue appears necessary to ensure their participation. In 2007 the Canadian Radio-television and Telecommunications Commission (CRTC) held hearings on a new media regulation and part of the discussion was a possible 3% ISP levy to fund Canadian content. The possibility of a levy on internet service, regardless if the final cost was born by the ISPs or passed onto consumers, was vociferously opposed by the industry.[53] The lure of additional revenue and the ability for subscribers to opt out of the monthly fee should assuage ISPs' fears that increased internet bills will negatively affect

their subscriber base and income.

The SAC proposal is enticing to consumers because it offers unlimited access to a considerably larger catalogue of music than available through conventional download services. While cost is often viewed as the single most important motive incenting file sharing, another factor is the large discrepancy between the number of tracks available on legal services versus file sharing. Empirical studies reveal that while cost (or the lack of it) is the dominant motive for file sharing, the ability to acquire music not available on legal services is also a significant motive.[54] For example, iTunes offers 18 million different tracks;[55] however, this represents a fraction of the 100 million plus recordings on unauthorized file sharing networks.[56] Ease of use, convince and the ability to try music before one buys are also factors that incent file sharing.[57] The SAC also suggests that by licensing file sharing, the files themselves will be safer and contain fewer viruses (although it is not clear how the licensing of file sharing will eliminate viruses other than if ISPs or other intermediaries launch their own services to facilitate sharing).[58]

Notably while the SAC proposal would license file sharing, it provides users with no incentive or legal ability to use shared content to create new creative works. The proposal would only license file sharing – specifically the right to communicate works to the public by telecommunication and the right to copy works.[59] Rights holders would still retain a broad swath of rights including public performance rights, translation and adaptation rights, and rental rights. As rights holders retain these rights, there is limited ability for individuals to create new intellectual goods using the music they would obtain legally through file sharing. The SAC, as a member of the Creators' Copyright Coalition has expressed opposition to attempts by the Canadian government to create a substantive UGC exception.[60] Furthermore the proposal is silent on the issue of TPMs. Under pending revisions to the Canadian *Copyright Act* circumventing a TPM for commercial purposes would be criminal and could result in a five year jail term and a fine as high as $1 million (CAD).[61] The failure of the SAC proposal to address the issue of TPMs is a serious shortcoming, and the lack of new incentives to encourage the production and distribution of intellectual goods undermines the proposal's ability to function as an effective alternative to copyright.

The SAC proposal is laudable for recognizing that pecuniary self-interest is not the only motive for file sharing. By licensing access to tens of millions of songs, essentially all recorded music that has at one point been made available, the proposal reflects the fact that legal music download/streaming services have limited catalogues. However, the proposal does not establish new incentives for the creation of music. Its focus on remuneration, which has been primary since the SAC originally proposed an ISP levy, is misguided. Strengthening the pecuniary incentive function of copyright may allow songwriters to be compensated for file sharing, but it does little to create a broader array of incentive mechanisms to encourage the production and distribution of intellectual goods.

C. Innovation

i. The SAC's Proposal and Infringement as Innovation

The SAC explicitly claims that its proposal will further innovation.[62] It also stresses that the benefits of monetizing online file sharing are not only economic but also cultural.[63] However, the SAC's conception of innovation is not without its own shortcomings. The SAC explicitly links infringement with innovation, yet rather than argue that infringing uses of copyrighted music allow the creation of new innovative intellectual goods, they suggest that in situations where infringement occurs the opportunity exists to license and legitimize new business models. They highlight both the unauthorized performance of live music in Paris in the 1850s and the early American broadcast industry in the 1920s as situations that eventually became licensed and now generate hundreds of billions of dollars in revenues.[64] It is true that the licensing and monetization of file sharing will generate innovative business opportunities, but there is no evidence that the resulting business models will support and enable new musicians. The Songwriters suggest that ISPs will be able to develop new proprietary music services and value added services, but it is not clear what incentives exist for ISPs to invest in struggling musicians. Monetizing the value of existing content is distinct from encouraging the creation of new music, and the SAC's proposal is focused entirely on the former without enough attention to the latter.

ii. Legitimizing P2P Technology

Although the SAC proposal does little to encourage the creation of new music or transformative re-use of existing musical works and sound recordings, it is commendable in that it would legitimize peer-to-peer technology. P2P technology like the VCR and CD burner is a dual use technology – it creates new forms of interaction and entertainment, but also allows widespread copyright infringement.[65] P2P applications can be used just as easily to exchange non-infringing content as they can be copyrighted works. In the case against the P2P service provider, Grokster (brought by MGM), Justice Breyer noted that a wide range of non-infringing materials could be found including free electronic books from Project Gutenberg, public domain software, licensed video content provided with the consent of the rights holder, and notably authorized copies of music by a range of artists including Wilco, Pearl Jam, Dave Matthews and John Mayer.[66] Suppressing a disruptive, dual use technology in its infancy is not necessarily the best approach. Had movie studios been successful in removing Betamax (and by extension the VCR) from the consumer market, they would have eliminated a significant source of future revenue. In 2003, box office receipts made up less than 20% of studios' income, while the home entertainment market, which had by then increasingly evolved towards DVDs, made up over 80% of revenues.[67] By legitimizing P2P the potential for future innovative (and potentially profitable) uses is heightened. In this regard the SAC's proposal helps encourage future innovation.

iii. Supporting New Artists

While the SAC suggests that its proposal is to the benefit of new artists,[68] this argument is tenuous at best. New artists who are not yet signed to contracts can already use file sharing to promote their music, and if they are the copyright holders then they can share authorized copies of their music in an effort increase their fan base. Soulseek is a file sharing technology designed for exactly this purpose.[69] The SAC proposal adds nothing for artists or consumers using Soulseek, though it does help Soulseek alleviate some of its legal troubles.[70] The content on Soulseek is already authorized so users gain nothing from a $10 monthly fee and would likely opt out. For independent artists there is no

immediate benefit either and their prospects within the music industry may be worsened. If file sharing for major artists becomes licensed, unsigned artists who are willing to give away their music for free in hopes of being discovered lose a major differentiating factor from established artists (the fact that the music is free). When consumers are given free, legal access to the entire catalogues of established artists and bands like U2, Metallica, Britney Spears and Lady Gaga who have a significant degree of media attention it will only become harder for obscure, unsigned artists to break through or generate a significant number of downloads to support themselves through recording music though some individuals will always seek out new and obscure artists. Furthermore, because the SAC proposal suggests that revenues be prorated based on the number of downloads,[71] it will benefit established artists the most. An analogous example is available from YouTube. In 2010 the most popular UGC video generated 61 million hits, but this is still six times smaller than the number of hits received by the most popular video that year, the music video for Justin Bieber's song "Baby."[72] Without a detailed mechanism for providing support for new starving artists the SAC's proposal limits the degree of innovation in music which will occur.

The SAC's proposal presents mixed opportunities for innovation. It should be lauded for attempting to legitimize file sharing technology; however, without providing users additional rights or significant revenue streams for new artists it limits the degree to which it promotes innovation in music.

D. Ideological Elements

i. Economic vs. Cultural Value of Music

Remuneration lies at the core of the SAC's proposal. On the surface remuneration is a plausible principle; individuals should be compensated for their labour. However, the SAC's proposal is seriously handicapped by conceptually linking monetization to the other exclusionary rights in copyright. Copyright should not be conceived as simply a remuneration system for creators, and must weigh the interests of society.[73] The SAC monthly fee does not allow downloaders to take existing music and repurpose it in their own innovative and creative manner because several of the economic rights of copyright

remain. Without allowing new creative uses of existing works in addition to file sharing, the SAC proposal makes transformative users no better off than they currently are. Remixers would continue to have to rely on hoping that their use of the work was covered by fair dealing exceptions and they would have no ability to make transformative uses of works protected by TPMs. Monetization should be decoupled from the exclusionary, commodifying dimensions of copyright.

The focus on the monetization presents a second ideological difficulty for the SAC proposal. It overemphasizes the economic dimension of copyright while undermining the cultural element. On their website the SAC stresses the cultural importance of music. They quote Canadian songwriter Christopher Ward stating, "Humanity's need for music is primal. The soundtracks of our lives accompany us through everything we do – working, praying, dancing and procreating."[74] Yet attaching a right to remuneration to the exclusionary economic rights in copyright only serves to further the commodification of music. On the same webpage as Ward's comments about the centrality of music to everyday life, there is a comment by songwriter Joan Besen who simply suggests infringing copyright is the same as stealing a physical good. Besen implies that music is a generic commodity like sweaters, shoes, or groceries,[75] completely undermining the crucial socio-cultural aspect of music. While the SAC is clearly aware of the cultural value of music their emphasis on remuneration downplays this value.

The SAC website contains a video testimonial by Randy Bachman in support of the SAC proposal.[76] He notes that individuals entering the music business will not be able to make a living from it and should be prepared for a life of hard times.[77] Although true, this assessment is not new. Artists of all kinds have always faced dim prospects for broad success. The problematic aspect of Bachman's statement is that by focusing on the limited likelihood of pecuniary success he casts writing and performing music in overly economic terms. Individuals should not create music under the delusion that it will necessarily result in great fortune; however, the lack of financial success does not mean that there are not many other powerful motives for playing music. The SAC's focus on remuneration overshadows the personal and cultural aspects of playing music. In doing so they take one of the most important means of expression and narrowly portray it as a

situation where self-interested individuals should not engage in creating music because of the poor pecuniary prospects. This instrumentalist and economic approach to viewing music contrasts sharply with Ward's insightful comments on how important music is to humanity.

E. Conclusion

i. Outstanding Limitations and Weaknesses of the SAC Proposal

Although the Songwriters Association has put considerable effort into improving and revising their proposal some significant limitations remain. Other than a brief mention that file sharing traffic monitoring company Big Champagne ensures consumer privacy,[78] there is a lack of discussion on the privacy dimensions of the SAC proposal and specifically if ISPs will pass along subscriber information to collective licensing agencies. This omission is in sharp contrast to the new U.S. copyright alerts system where ISPs have pledged not to pass along user information to rights holders.[79] The proposal also fails to address the potential for internet users to pay the monthly fee once and then copy/download a lifetimes worth of music and never pay the fee again. Since the SAC proposal would allow drive cloning in addition to file sharing[80] those paying the monthly fee could copy a 2 terabyte (TB) drive worth of songs and get roughly half a million tracks of music and have little need to pay the monthly fee in the future.[81] Finally and most importantly, although the SAC suggests that their proposal is uniquely suited to music file sharing,[82] if such a new revenue stream is devised for audio music it is likely that film and television creators, publishers and rights holders would seek to establish similar deals with ISPs. This outcome is particularly likely given that ACTRA, the Directors Guild of Canada and the WGC have already called for an ISP levy to fund Canadian content on the internet.[83] How many different monthly fees would exist for file sharing, and more importantly how would such licenses/fees affect the capacity of broadband networks. Although these problems are not insurmountable, until they are addressed (along with clarifying the exact amount of the monthly fee and the issue of TPMs) the SAC proposal remains incomplete and in need of further development. Evidence based policy analysis is acutely needed to address these issues in a more

holistic manner.

ii. Lack of Incentive for the Creation of New Intellectual Goods

Another serious problem is that the proposal provides little in the way of incentives (or legal rights) to create new content or support new artists, though it does provide songwriters especially established ones with an additional revenue source. In this regard the SAC proposal is more accurately represented as an additional revenue scheme rather than a substantive alternative to copyright. The danger with both the SAC's private ordering approach and its previous suggestion of a levy is that consumers end up paying twice.[84] The proposal could be strengthened by either allowing monthly fee payers to create new user-generated content from material they acquire or ensure that a substantive portion of the revenue generated by the fee goes towards supporting and developing new artists. The proposal should also be expanded to provide greater clarity on the issue of TPMs. Those opting to pay a $10 monthly fee should also have to the right to circumvent a TPM to share music, or else the monthly fee is of limited appeal and value to end users.

iii. SAC Proposal vs. Other Alternatives for Addressing File Sharing

Although there are considerable shortcomings with the SAC proposal, it cannot be evaluated without some comparison to other alternatives for addressing file sharing. In contrast to expansive and pervasive TPMs, such as the approached discussed by Lunney,[85] the SAC proposal is preferable. TPMs and legal protection for anticircumvention measures grant considerable power to rights holders and do not confer any new benefits to end users. Furthermore technical systems are always surmountable, and reliance on TPMs will induce a socially wasteful cycle investment of time, capital and human creativity in creating and defeating new digital locks. While there are several shortcomings to the SAC proposal, it is preferable to a world where music and other digital goods are protected by ever more complex technical means.

Contrasting the SAC proposal with the graduated response systems that were recently adopted in the U.S. and several other countries presents a much more difficult case. Both approaches recognize the centrality of ISPs in the issue of online file sharing.

Unauthorized file sharing creates strong demand for broadband, and when users are billed based on the volume of bandwidth they consume file sharing is particularly lucrative for ISPs. The Center for Copyright Information, which administers the U.S. copyright alert system, notes that 70% of users cease infringing activity once alerted that their activity is illegal.[86] For rights holders, such a system appears to provide clear benefits as they do not have to surrender any of their existing rights. While the graduated response system may stem illegal file sharing through a relatively simple education program, the SAC proposal does benefit consumers by giving them the option to pay to file share. Furthermore, the two approaches are not incompatible, and a graduated response system combined with an optional monthly fee would represent a more comprehensive alternative.

Although the SAC proposal contains promising elements and merits critical examination, it is still incomplete. Because it only slightly modifies the current copyright system it is more of an adjunct to copyright than an alternative, and it is not comprehensive enough to completely replace the entire copyright system. Though it is a mechanism for dealing with illegal file sharing and ensuring that artists and rights holders are compensated for their labour, it is at best a very limited alternative to copyright.

II. Defensive Publishing

This case study examines defensive publishing as an alternative to patenting. It begins with an overview of the early disclosure, and then examines the incentives and disincentives for defensive publication, its ability to further innovation, and some of the ideological dimensions of defensive publishing.

A. Overview

i. Context

Defensive publishing is an alternative to patenting that uses the patent system to prevent information from being protected in a proprietary manner. By publishing information a firm or individual can establish prior art in a specific area. Prior art prevents a patent application covering the same or substantially similar information from meeting the

novelty and non-obviousness requirements of patentability. Though conceptually simple, defensive publishing is more complex in practice as establishing prior art requires that a firm publish in a manner that will come to the attention of patent examiners and meet the strict requirements of prior art.[87] While scholarly literature has often suggested that defensive publishing is incented by the desire to prolong patent races,[88] the limited empirical evidence on motives for defensive publishing suggests that a range of motives incent disclosure.[89] Defensive publishing in the form of technical disclosures published by corporations has been practiced for over 50 years, although in the past decade there has been a shift away from self-published disclosure bulletins towards internet based defensive publishing services.[90] However, because defensive publication can be pursued in a variety of formats from a publication in an academic journal or trade press to an intentionally abandoned patent application it is difficult to determine the scope of defensive publication. It is even possible to defensively publish in a highly inconspicuous and undetectable manner as U.S. case law has recognized that a single copy of a doctoral dissertation published in a foreign language and held by a foreign library can constitute prior art.[91] However, such a publication venue would be poorly suited for having patent examiners locate one's work prior to granting a competitor a patent.

ii. Defensive Publication and Corporate Technical Disclosure Publications

Corporate defensive publishing has its roots in IBM's *Technical Disclosure Bulletin* first published in 1958.[92] Xerox adopted a defensive publication strategy in 1976 and this strategy has since been emulated by several high technology firms including Siemens, Sony, Motorola and Microsoft.[93] In February 1998, IBM ceased publishing the *Technical Disclosure Bulletin* instead making its disclosures available online for a fee from IP.com, a defensive publishing company. IP.com's prior art database contains not only the complete collection of the *Technical Disclosure Bulletin*, but also complete collections of the disclosure publications for the firms previously listed as well as the technical publications of the Internet Society Request for Comments, National Institute of Standards and Technology and the Software Patent Institute.[94] While some firms still defensively self-publish such as IBM's Redbook series available for free on its website,[95]

third party defensive publishing services have been gaining increasing popularity.

iii. Third Party Defensive Publication Services

Third party defensive publication services are dominated by two firms: Research Disclosure and IP.com. The former has been in existence for over a half century,[96] and has the unique designation of being the only defensive publication service whose journal must be searched for prior art by International Searching Authorities under rule 34.1(B)(III) of the Patent Cooperation Treaty (PCT).[97] IP.com operates a prodigious prior art database containing over 160,000 publications.[98] For a fee both companies offer electronic deposit in searchable databases as well as publishing disclosures in print journals that are made available to patent offices around the world.[99] While Research Disclosure and IP.com dominate third party defensive publishing there are some other defensive publishing services. Defensive Publications provides publishing services open source projects.[100] However, Defensive Publications itself relies on the services of IP.com, although it is a costless service for authors as the publication fees are covered by its sponsoring agency Linux Defenders.[101] Peer Patent has recently announced that it will set up its own free to use defensive publishing service.[102] While new services may offer costless mechanisms for defensive publishing, IP.com's size and Research Disclosure's inclusion in the list of minimum publication for review under the rules of the PCT are likely to ensure that these two firms dominate the third party defensive publishing market.

iv. The United States' Statutory Invention Registration Program

U.S. patent laws contain a defensive publication mechanism built directly into the patent system. Initially defensive publications, which were considered prior art as of the date of publication, could be pursued through the Defensive Publication Program that ran from April of 1968 to May of 1985.[103] The *Patent Law Amendments Act of 1984* replaced defensive publications with the Statutory Invention Registration (SIR) system codified in 35 U.S.C. 157.[104] SIRs are not patents but do ensure freedom to operate, and like the earlier defensive publications are considered prior art.[105] SIRs, designated by USPTO kind codes beginning with an "H," do not provide recipients with rights to remuneration

or to prevent infringement, thus they effectively place the knowledge covered in the application in the public domain.[106] Generally the information covered in SIRs is published, although a mechanism does allow applicants to request that their SIR go unpublished.[107]

Several factors undermine the effectiveness of SIRs. The 1999 *American Inventor Protection Act* removed much of the necessity for the SIR program by stipulating that patent applications would be published after 18 months subject to certain exceptions.[108] This change allows firms to defensively publish simply through abandoning patent applications. SIRs are not a costless procedure and applicants will pay between $920 and $1,840 to have an SIR published.[109] Finally, while the USPTO recognizes SIRs as establishing prior art as of their filing date,[110] foreign patent offices only recognize SIRs as establishing prior art as of their publication date which is normally 18 months later.[111]

The SIR program has been of limited effectiveness. From 1986 to 1996 there was an average of 145 SIRs granted each year with a high of 212 in 1987.[112] However in the last five years (2006 to 2010) the average has plummeted to just over 20 with only six SIRs granted in 2009 and 17 in 2010.[113] Furthermore the U.S. Army, Navy and Air Force have been the dominant receivers of SIRs with the Navy and Air Force receiving a plurality of SIRs in three of the five most recent years.[114] Given that in 2010 the number of SIRs totaled less than 1/100th of 1% of U.S. utility patents granted, it is difficult to describe the USPTO's defensive publication mechanism as a successful alternative to patents. The recent U.S. patent reform act (the *Leahy-Smith America Invents Act*) will eliminate the SIR program as of March 16, 2013.[115]

v. Other Methods and Scope of Defensive Publishing

Self-published technical journals, third party defensive publishing services and SIRs are only three of a range of means firms can defensively publish. Articles can be published in trade press, academic periodicals or professional journals, but because corporations lack control over the timing of publication and editorial process these avenues are less effective. Corporations can also publish defensively in marketing materials or through their corporate website, although concerns over establishing the authority and publishing

date of such documents in a patent trial undermine the usefulness of these approaches. A 2002 survey for the Intellectual Property Owners Association provides some indication of the popularity of various defensive publishing forums; however, the results, which are summarized in the table below, reflect a very small sample of respondents.[116]

Table 2: Publication Method Used by Firms that Defensively Publish

Publication Method	Share (%)
Academic or Professional Journals	52
Trade Press	42
Marketing Materials	27
Third Party Publication Service	20
In House Journals	17
Corporate Website	14
Statutory Invention Registration	8
Other	5

Source: Cockburn and Henderson (2003).[117]

Thus despite the limitations in academic, professional and trade publications these remain the most popular publication venues from this small, 2002 survey. These results are contrasted by a 2008 German study that found third party defensive publishing companies were the most popular venue for defensive publication used by 37% of firms in the study.[118] The study also revealed that other forums for publication include withdrawn patent applications, postings made on the factory gate, and disguised/obscure publications.[119] While there are numerous reasons to withdraw a patent application, withdrawn applications also represent a cost effective means of establishing prior art and securing freedom to operate.[120] One respondent at a major German company even admitted that in an effort to ensure competitors would not discover the disclosed information publication occurred in a seemingly irrelevant journal in the Kirghiz language.[121]

Empirical investigations provide no clear indication of the scope of defensive publication. Johnson notes that prior to 2000 78% of the disclosures contained within the databases of Research Disclosure and IP.com were from three companies (IBM, Motorola and Siemens).[122] There is evidence that the practice is being more widely used. The 2002 Intellectual Property Owners Association study found that less than 30% of companies surveyed viewed defensive publication as an important strategic tool,[123] but a German

study that interviewed 37 different companies, including 29 of 30 companies on the DAX (Deutsche Borse AG German Stock Index) 30, found that 70% of companies engaged in defensive publication.[124] IP.com proudly displays a long list of prominent corporations using its services which includes Coca-Cola, Dow Chemical, Eastman Kodak, France Telecom, General Electric, IBM, Lockheed Martin-Manassas, Siemens AG and Sony Electronics, among others,[125] while Research Disclosure claims that its service has been used by 90% of the world's leading companies.[126] Given the variety of forums in which defensive publishing can occur it is impossible to determine the exact scope of defensive publishing. Despite the difficulties in determining the exact scope of defensive publishing it is clear that it is an important alternative to traditional methods of protecting innovation such as patents and secrecy. The next section examines the numerous reasons firms forgo the potential of exclusionary rights and short term pecuniary gain to defensively publish.

B. Incentives

IBM has led the world for nearly 20 consecutive years in obtaining the most U.S. patents receiving more than 5,000 patents in 2010 alone,[127] yet this same company has been at the forefront of defensive publication announcing in 2009 that it will aim to publish over 3000 technical inventions a year forgoing proprietary rights.[128] Why would a firm that has been the most prolific patenting company over the past generation give away so much information? It is because strong strategic incentives exist for defensive publishing; however, unlike the patent system, defensive publication does not provide the opportunity for short term pecuniary gain through exclusionary rights. Empirical studies reveal that motives for defensive publishing include preserving freedom to operate, defense publishing is less costly than patenting, some disclosures cover inventions that may not be patentable, and patents can be of little value because of high enforcement costs.[129]

Cost is a major factor in incenting defensive publishing. As of September 26, 2011, the cost for applying, receiving and maintaining a U.S. utility patent will total over $11,000, and this amount does not include any legal fees.

Table 3: U.S. Utility Patent* Fees as of Sept. 26 2011

Fee	**Cost (USD)**
Basic Application Fee	$380
Search Fee	$620
Examination Fee	$250
Issue Fee	$1,130
Maintenance Due at 3.5 Years	$1,130
Maintenance Due at 7.5 Years	$2,850
Maintenance Due at 11.5 Years	$4,730
Total	**$11,090***

* For patents with three or less claims under 100 pages in length
Source: USPTO (2011).[130]

In addition it takes nearly three years from application to grant,[131] while a defensive publication can be done in an hour.[132] Although it is possible to request an expedited examination at the USPTO, the fee for doing so is $4,800.[133] Research Disclosure charges $120[134] per page of publication,[135] and IP.com charges $225 per publication[136] which is substantially less than the $920 charged by the USPTO for a SIR. Defensive publication also reduces litigation fees. Receiving a patent raises the possibility of being litigated against which does not come with defensive publication, and a prominently placed defensive publication can save a company from the time and expense of invalidating a competitor's patent. While cost reduction is a pecuniary incentive, it is of a markedly different character than obtaining an patent right with the intention of then being able to profit by having exclusive control over the technology covered.

One disincentive for defensive publishing is that publishing research findings provides competitive intelligence on R&D activities to competitors. In an effort to mitigate this problem both Research Disclosure and IP.com allow anonymous submissions.[137] Fears of disclosing research activities to rivals also motivates disguised defensive publications. From a strategic perspective anonymous disclosures are superior to disguised publications because patent examiners are not likely to find hidden publications. Furthermore, while U.S. case law suggests that obscure publications may stand up at trial,[138] firms are often unwilling to go through the expense of litigation to invalidate another's patent.[139]

The primary incentive for defensive publication, ensuring freedom to operate, may be significantly weakened by the recently passed *Leahy-Smith American Invents Act* (also known as the *Patent Reform Act of 2011*).[140] Section 5 of the bill expands the prior commercial use defense from covering only business methods to all patentable subject matter.[141] As long as prior use occurred in the U.S. and at least one year before either the effective filing date of the claimed invention or the date at which the claimed invention was disclosed to the public, the party using the invention has a new defense for infringement subject to certain exceptions.[142] Given that prior use can now constitute a defense for infringement the impetus to defensively publish may be seriously lessened, though as noted by Rantanen it is possible that the changes to the conditions for patentability (35 U.S.C. § 102) in the *America Invents Act* may actually encourage more defensive publication.[143]

It would be extremely naïve to suggest that defensive publication occurs because firms want to contribute to the public good for altruistic motives. Defensive publishing is engaged in because of the powerful strategic motives; however, the presence of strategic motives does not imply that defensive publishing bears little difference from patenting. Through defensive publishing firms assure themselves of freedom to operate and lower costs. This approach stands in sharp contrast to patenting where firms gain an exclusionary right that they can then use for pecuniary gain.

C. Innovation

i. Access to Knowledge

At first glance defensive publication appears to encourage innovation by placing information in the public domain but without the exclusionary rights that limit use of such knowledge; however, in practice, defensive publishing is a much more complex and nuanced alternative to patenting.

One complicating factor is the diversity of forums for defensive publications. Disguised defensive publications do little to further innovation because the information is disclosed in an obtuse manner. Conversely disclosures in trade, academic and professional

publications are much more likely to ensure broad access to information and further innovation. The services of IP.com and Research Disclosure, which are becoming increasingly dominant,[144] are not freely accessible. Generally IP.com charges $40 to download a document from its database, although some lengthy documents may cost more, while others may be free.[145] Research Disclosure charges $745 per year for a subscription to its journal and $1,490 for a single license to access its database.[146] While these fees do limit access, they do not entirely undermine the ability for defensive publications to encourage innovation. Trade, academic and professional journals themselves often have a cost as well. Furthermore, as part of the IP.com prior art database is searchable for free, and searches return an overview of the document without requiring payment.[147] Research Disclosure provides free access to recent disclosures.[148] It is also important to note that the literature covered in defensive publications tends to be highly technical in nature and not material that the lay population has a large appetite for or ability to digest. Research Disclosure specifically notes that its publications are not entertaining articles but concise descriptions of an invention.[149] At the firm level the cost for accessing these research disclosures is not prohibitive, and it is also far more likely that firms, rather than individuals, can make innovative uses of the information contained. While defensive publication through third party services does not provide as broad access as simply placing information on a publicly available website, it does provide access to information often in a manner more concise than long worded and nebulous patent applications. Most importantly it places such information in the public domain rather than commoditizing in the form a patent.

ii. Patent Quality

A second important function of defensive publication is to improve the quality of patents. The greater the scope of the public domain and prior art the higher the bar for patentability. The point is made succinctly by IBM which states:

> Publication of technological information is one means to "promote the Progress of Science and useful Arts," the phrase in the U.S. Constitution giving the Congress the power to enact patent laws. Publication protects inventors from allegations of infringement by placing the intellectual property into the body of prior art. Publications

> also improve patent quality, since they can be cited by patent offices in limiting the scope of patent applications. Publication also helps spur follow-on innovation that ensures dynamic business growth.[150]

Patent quality is an acute problem. In its February 2011 update on the national innovation strategy, the Obama administration specifically notes high quality patents improve innovation, while low quality patents increase socially wasteful litigation and erect barriers to innovation and creativity.[151] While some modes of defensive publications and disguised disclosures in particular do not immediately contribute to improving patent quality as they may not be found by patent examiners, prominent disclosures, such as those appearing in reputable journals, do. In the case of publications made through Research Disclosure every patent office in the world receives a copy of their journal in addition to having the journal listed in the PCT minimum documentation list.[152] IP.com provides its journal to the pentadic patent offices (USPTO, EPO, JPO State Intellectual Property Office of the People's Republic of China (SIPO) and Korean Intellectual Property Office (KIPO)), as well as the patent offices of six of seven G7 countries (all but Italy) and all four of the BRIC countries (Brazil, Russia, India and China) in addition to the Denver and New York Public Libraries, The British Library and Library of Congress amongst others.[153] This broad distribution ensures that patent examiners around the world can better assess the state of prior art and thus improve patent quality.

iii. Empirical Evidence of Innovation

Though defensive publications are difficult to quantify, there is empirical evidence that such disclosures encourage innovation. Ironically, a primary source for such evidence is patents that reference disclosures. When material that is part of a disclosure database is cited in a patent application it demonstrates that some of the information contained in the disclosure has facilitated a new invention. Using the USPTO's patent database (covering patents issued since 1976), a search of patents referencing IP.com's database reveals that it has been cited in over 500 patents in the "Other References" section; Research Disclosure has been cited over 8,500 times.[154] In the case of these patents, earlier defensive publications have enabled future innovations providing some empirical evidence for the claim that defensive publications facilitate innovation. More

importantly, disclosure databases also help improve patent quality that facilitates innovation. IP.com has made its database available, free of charge, to Peer to Patent reviewers allowing them to make better assessments of prior art which in turn helps mitigate the problem of spurious patent applications for existing technologies.[155]

Although there are some limitations on access to the information disclosed in defensive publications, such publications not only encourage innovative activity, but also do so with fewer restrictions than patents.

D. Ideological Elements

i. The Commodification of Defensive Publishing

While defensive publishing offers considerable advantages over patenting with respect to facilitating innovation, there is cause for a degree of concern that the process of defensive publishing itself is becoming increasingly commodified. With the recently legislated cancelation of the U.S. SIR program avenues for prominent defensive publications are becoming increasingly restricted. Research Disclosure and IP.com, the two dominant third party services, are for profit companies. While new services may appear, the size of IP.com's prior art database and Research Disclosures unique inclusion within the PCT minimum literature suggest that it will be difficult to displace these two firms from being the primary third party publishers. It is not the fact that these two firms charge to publish – widely distributing disclosures in print and electronic form to numerous patent offices is not a costless operation – but the limitations on access these firms impose that, to a degree, undermine the effective of defensive publishing as an alternative patenting. As noted by Arrow if innovation is paramount, then the optimal distribution is free distribution.[156] While there may be little mass demand for the information contained in technical disclosures, greater costless access to such material is preferable. Ultimately though, the commodification of defensive publishing as a service is superior to the commodification of information in and of itself.

ii. Recognizing the Collective Nature of Invention

The great inventions of the 19th and early 20th century are often associated with a single

inventor (or what Bell calls talented tinkerers) – Bessemer, Edison, Marconi, Bell, the Wright brothers, and Ford.[157] However, the landmark inventions since World War II (such as satellites, home computers, the internet, cell phones) are not often credited to individuals. Invention has become an increasingly collective activity requiring entire R&D teams, marketers and visionary corporate leaders to turn laboratory results into diffused innovations. Despite this change, the utilitarian justification for patents is commonly framed around creating incentives for individuals. Defensive publishing eschews this mythologizing. Both the academic literature on the subject and the marketing materials of Research Disclosure and IP.com discuss defensive publishing as a firm-level activity. While individual inventive and creative effort is still crucial, patents and their alternatives should be framed collective undertakings (whether at firms, universities or other organizations). The collective nature of invention stands in sharp contrast to copyright where the individual may still play a commanding role.[158]

Reframing invention as a collective endeavour is crucial to crafting effective innovation policy. Policymakers should ensure that individual inventors have means available to them to help them diffuse and improve their innovations, but the breakthrough innovations of the 21st century and beyond that will address major social, environmental, and health problems are far more likely to come from corporate R&D labs and university campuses than basements and garages. Patent rules that require that individuals be named on patent applications only serve to reinforce the idea that invention is an individualized activity. By framing invention in these terms it encourages expansionary patents laws as the exclusionary rights of the patent are depicted as only way for the little inventor to protect his rights from be appropriated by others. Defensive publishing not only encourages innovation, but it also portrays invention for most often is – a competitive corporate, environment where firms compete with each other to reduce costs and generate new products and services.

E. Conclusion

Defensive publishing is an effective alternative to patenting, yet it is also important to note that it is because of the patent system itself that the incentives to defensively publish

exist. The fact that disclosure is premised on precluding the patents of others is the greatest limitation of defensive publishing as an alternative – without a patent system to incent early publication it is difficult to conceive of how or why pre-emptive publication would take place. Thus defensive publication can never wholly replace the patent system.

Although defensive publication exists as an alternative to patenting only because of patenting, this limitation does not imply that it is not a useful alternative. Defensive publication places knowledge in the public domain, and because it must be done so pre-emptively to be effective it speeds the rate of disclosure. In addition to providing access to knowledge, with some limitation, it also facilitates innovation and improves the quality of the patent system itself. This last quality is particularly important. Not only does defensive publication encourage innovation, it actually forces the patent system to address its most serious problem – the dearth of low quality patents. While defensive publishing should raise some concerns with regards to the commodification of the defensive publication process and cost barriers for access to some forms of disclosure, its promotion of innovation, improvement of the patent system and recognition of the collective nature of innovation make it an effective alternative to patenting even if it can never hope to replace patenting.

III. The Effectiveness of Alternatives to IP

Alternatives to IP are not inherently superior to exclusionary rights. In some cases, particularly TPMs, access may be restricted to an even greater degree and the creator or distributor of the informational good holds an undue amount of control over the use of the intellectual work. The most prominent alternatives (prizes, FOSS and OA scholarly publishing) are successful because they draw on a range of incentives while still resulting in innovative outcomes and facilitating access and use of the underlying information. These same qualities are possessed by defensive publishing. The same cannot be said for the SAC's ISP monthly fee proposal. Its focus on remuneration, lack of new incentives for creation and overly economic focus on music diminish its ability to function as an alternative to the copyright system; however, it should be recognized that the proposal

does address the problem of online file sharing.

Ultimately a crucial factor in the success of alternatives to IP is their adoption by creators, authors and inventors. It is still unclear if the SAC's proposal will ever become more than a proposal. However, it should also be noted that the SAC has demonstrated a history of allowing its proposal to evolve, and as such the potential does exist for it to become a substantive alternative. In the case of defensive publishing, while IP.com's prior art database totals over 160,000 publications, this figure is still well below the 219,614 utility patents issued in the U.S. in 2010 alone.[159] Furthermore, the recent creation of a prior use defensive for patent infringement may seriously disincentivize early disclosure with the negative consequence of increasing secrecy and decreasing the amount of knowledge placed in the public domain. Without adoption in the case of the SAC proposal or broader usage in the case of defensive publishing, these alternatives will continue to exist at the margins of the IP system despite any usefulness they may have as alternatives.

Notes to Chapter Seven:

---

[1] Gervais, "User-Generated Content and Music File Sharing," 450 n. 12.
[2] Canadian Recording Industry Association (CRIA), "Statistics: December 1999," (n.d.): http://www.cria.ca/stats/1299_s.php
[3] CRIA, "Statistics: December 2009," (n.d.): http://www.cria.ca/stats/1209_s.php
[4] OECD, *OECD Information Technology Outlook*, (2010), 182: http://dx.doi.org/10.1787/it_outlook-2010-en
[5] SAC, "Proposal FAQ."
[6] SAC, "Our Proposal," 2; International Federation of the Phonographic Industry (IFPI), *Digital Music Report 2009: New Business Models for a Changing Environment*, (2009), 5: http://www.ifpi.org/content/library/DMR2009-real.pdf
[7] IFPI, *IFPI Digital Music Report 2011: Music at the Touch of a Button*, (2011), 5: http://www.ifpi.org/content/library/DMR2011.pdf
[8] Stan J. Liebowtiz, "File Sharing: Creative Destruction or Just Plain Destruction?" *Journal of Law and Economics*, 49, (2006), 19-20.
[9] Liebowtiz, "File Sharing," 2.
[10] *A&M Records, Inc., v. Napster, Inc*., 239 F. 3d 1004 (2001).
[11] Grokster, "Grokster."
[12] *Arista Records LLC v. Lime Group LLC*, 715 F. Supp. 2d 481 (2010).
[13] IFPI, *IFPI Digital Music Report 2011*, 14; Alain Bourdeau de Fontenay, Eric Bourdeau de Fountenay, and Lorenzo Maria Pupillo, "The Economics of Peer-to-Peer," *Peer-to-Peer Video: The Economics, Policy, and Culture of Today's New Mass Medium*, Eli M. Noam and Lorenzo Maria Pupillo (eds.,) (New York: Springer 2008), 66, and 72.
[14] Gervais, "User-Generated Content and Music File Sharing," 454; and, de Fontenay et al., "The Economics of Peer-to-Peer," 50; Carrier, *Innovation for the 21st Century*, 120.
[15] de Fontenay et al., "The Economics of Peer-to-Peer," 49.

[16] Birgitte Andersen and Marion Frenz, *The Impact of Music Downloads and P2P File-Sharing on the Purchase of Music: A Study for Industry Canada*, (2007), 33: http://www.ic.gc.ca/eic/site/ippd-dppi.nsf/vwapj/industrycanadapapermay4_2007_en.pdf/$file/industrycanadapapermay4_2007_en.pdf
[17] Eric P. Chiang and Djesto Assane, "Determinants of Music Copyright Violations on the University Campus," *Journal of Cultural Economics*, 31, (2007), 190.
[18] RIAA, "For Students Doing Reports," (2011): http://www.riaa.com/faq.php
[19] See *BMG Canada Inc. v. John Doe*, [2004] 3 FCR 241, 2004 FC 488; and, *BMG Canada Inc. v. John Doe*, [2005] 4 RCF 81, 2005 FCA 193.
[20] SAC, "Our Proposal," 1.
[21] Sookman, "The SAC Proposal for the Monetization of the File Sharing of Music in Canada," 132; and, Geist, "Songwriters rewrite bid for legalized file sharing."
[22] Eddie Schwartz, "Legalize File Sharing," *The Mark*, (15 Apr. 2010): http://www.themarknews.com/articles/1305-legalize-file-sharing
[23] SAC, "Our Proposal," 4-5.
[24] SAC, "Our Proposal," 9.
[25] Michael Geist, "Everybody is Jumping on the ISP Levy Bandwagon," *Toronto Star*, (10 Mar. 2008): http://www.thestar.com/sciencetech/article/326749
[26] Writers Guild of Canada, "Writers Guild of Canada Presents New Ideas for More Canadian Stories Online."
[27] L'Accès Gratuit à la Musique est un Mythe, "L'AGAMM Rights Holders Demand Their Fair Share," (15 Jun. 2010): http://www.apem.ca/lagamm/cmq_ang_15juin10.pdf
[28] SAC, "Our Proposal," 1.
[29] SAC, "Our Proposal," 4-5.
[30] SAC, "Our Proposal," 5.
[31] SAC, "Proposal FAQ."
[32] SAC, "Our Proposal," 9.
[33] University of Hertfordshire, *Music Experience and Behaviour in Young People: Main Findings and*, (2008), 31: http://songwriters.ca/ContentFiles/ContentPages/Documents/S.A.C.%20Proposal/Hertfordshire%20University%20Study%202008.pdf
[34] SAC, "Our Proposal," 4-5 (emphasis in the original).
[35] Robert Thompson, "Canada's Labels Slam Proposed Digital 'Tax,'" *Reuters*, (4 Jan. 2008): http://www.reuters.com/article/2008/01/05/us-canada-idUSN0432940320080105
[36] CRIA, "Statement on Private Copying Levies," (23 Apr. 2010): http://www.cria.ca/205.pdf
[37] Thompson, "Canada's Labels Slam Proposed Digital 'Tax.'"
[38] Michael Geist, "The SAC 'Distraction,'" (28 Feb. 2008): http://www.michaelgeist.ca/content/view/2714/125/
[39] Geist, "Songwriters rewrite their bid for legalized file sharing."
[40] Vito Pilieci, "Canadian Songwriters Propose $10 File Sharing Fee," *National Post*, (7 Mar. 2011): http://arts.nationalpost.com/2011/03/07/canadian-songwriters-propose-10-file-sharing-fee/
[41] Pilieci, "Canadian Songwriters Propose $10 File Sharing Fee."
[42] Slacker Radio, "Subscriptions," (2011): https://store.slacker.com/store/Subscriptions.do?source=site-header ; and Rdio, "Rdio Takes the Wraps of Social Music Service," (2010): http://www.rdio.com/#/press/20100803_Launch/
[43] Pilieci, "Canadian Songwriters Propose $10 File Sharing Fee."
[44] IFPI, *IFPI Digital Music Report 2011*, 18.
[45] IFPI, *IFPI Digital Music Report 2011*, 18-19.
[46] Center for Copyright Information, "Music, Movie, TV and Broadband Leaders Team to Curb Online Content Theft: Announce Common Framework for 'Copyright Alerts,'" (7 Jul. 2011): http://www.copyrightinformation.org/node/704
[47] Center for Copyright Information, "Frequently Asked Questions," (n.d.): http://www.copyrightinformation.org/faq
[48] Creators' Copyright Coalition, "Creators Set Out Principles for Effective Copyright Reform," (7 Jun. 2011): http://www.creatorscopyright.ca/op-ed/2011/06

[49] IFPI, *IFPI Digital Music Report 2011*, 9
[50] SAC, "Our Proposal," 6; SAC, "Are You an ISP, Consumer or Creative" (n.d.): http://www.songwriters.ca/ispconsumercreative.aspx
[51] SAC, "Are You an ISP, Consumer or Creative?"
[52] SAC, "Our Proposal," 6.
[53] Canadian Radio-television and Telecommunications Commission (CRTC), *Transcript of Proceedings Before the Canadian Radio-television and Telecommunications Commission, Subject: Canadian Broadcasting in New Media*, (10 Mar. 2009), paras. 9523, 9595-97, 9615, 10203, 10221, and 10733: http://www.crtc.gc.ca/eng/transcripts/2009/tb0310.html ; and, CRTC, *Transcript of Proceedings Before the Canadian Radio-television and Telecommunications Commission, Subject: Canadian Broadcasting in New Media*, (11 Mar. 2009), paras. 11222, 11504-06, and 11573: http://www.crtc.gc.ca/eng/transcripts/2009/tb0311.html
[54] Chiang and Assane, "Determinants of Music Copyright Violations on the University Campus," 192-93; and, University of Hertfordshire, *Music Experience and Behaviour in Young People*, 13.
[55] Apple, "What is iTunes?" (2011): http://www.apple.com/itunes/what-is/
[56] SAC, "Our Proposal," 2.
[57] Chiang and Assane, "Determinants of Music Copyright Violations on the University Campus," 193.
[58] SAC, "Are You an ISP, Consumer or Creative."
[59] These rights are only a fraction of the rights of authors provided by the Canadian *Copyright Act*, s. 3.
[60] Creators' Copyright Coalition, "Creators Set Out Principles for Effective Copyright Reform."; and, SAC, "Creators' Copyright Coalition Proposes Reforms to Bill C-32," (2010): http://www.songwriters.ca/news/258/20101206cccreformproposals.aspx
[61] Bill C-11, cl. 48.
[62] SAC, "Our Proposal," 2.
[63] SAC, "Our Proposal," 3.
[64] SAC, "Our Proposal," 2-3.
[65] Carrier, *Innovation for the 21st Century*, 105.
[66] *MGM v. Grokster*. 545 U.S. 913 (2005) at 952 Breyer J, concurring.
[67] Carrier, *Innovation for the 21st Century*, 108.
[68] SAC, "Our Proposal," 6; SAC, "Are You an ISP, Consumer or Creative."
[69] Soulseek, "Soulseek," (n.d.): http://www.slsknet.org/
[70] Soulseek, "Soulseek," (n.d.): http://www.slsknet.org/
[71] SAC, "Our Proposal," 4.
[72] "From Rant to Riches: Angry Student Tops the List of Most Watched YouTube Videos of 2010," *Daily Mail*, (14 Dec. 2010): http://www.dailymail.co.uk/news/article-1338374/YouTube-watched-videos-2010-topped-angry-student-Antoine-Dobson.html
[73] *Théberge v. Galerie d'Art du Petit Champlain inc*., [2002] 2 S.C.R. 336, 2002 SCC 34, at para. 30-32.
[74] SAC, "Songwriters' Perspectives."
[75] SAC, "Songwriters' Perspectives."
[76] SAC, "Songwriters' Perspectives."
[77] Randy Bachman, "Randy Bachman on the Songwriters Association of Canada's File-Sharing Proposal," (Video), (n.d.): http://www.songwriters.ca/songwritersperspectives.aspx
[78] SAC, "Our Proposal," 4.
[79] Center for Copyright Information, "Frequently Asked Questions."
[80] SAC, "Proposal FAQ."
[81] This calculation is based on the SAC's own numbers that the average audio file is 4MB, thus a 2TB (or 2 million MB) drive could hold 500,000 songs (SAC, "Proposal FAQ.").
[82] SAC, "Proposal FAQ."
[83] See chap. 6, s. I.A.ii.
[84] Jeremy F. DeBeer, "Locks and Levies," *Denver University Law Review*, 84, (2006), 177.
[85] See chap. 2, s. 2, n. 92.
[86] Center for Copyright Information, "Frequently Asked Questions," (n.d.): http://www.copyrightinformation.org/faq
[87] The USPTO's *Manual of Patent Examining Procedure* contains a 54 page chapter detailing the rules governing what is and is not considered prior art, and the Canadian *Manual of Patent Office Practice*

contains over 200 references to the term "prior art" including numerous examples of what is considered prior art (USPTO, *Manual of Patent Examining Procedure*, 8th ed. (2010), 900-1 – 900-54 (s. 9): http://www.uspto.gov/web/offices/pac/mpep/index.htm ; CIPO, *Manual of Patent Office Practice*).

[88] Baker and Mezzetii, "Disclosure as a Strategy in the Patent Race," 177, Bar, "Defensive Publications in an R&D Race," 232; Licchtman et al., "Strategic Disclosure in the Patent System," 2179, and Parchomovsky, "Publish or Perish," 929-30.

[89] Henkel, and Pangerl "Defensive Publishing," 18-21; and Cockburn and Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*, I.1.

[90] IBM, "Technical Disclosure for Patents," (n.d.): http://www.ibm.com/ibm/licensing/patents/disclosures.shtml

[91] *In re Hall*, 781 F. 2d 897, (Fed. Cir. 1986), para. 3-4, and 27-28.

[92] IBM, "Technical Disclosure for Patents."

[93] IP.com, "Searching Overview," (2011): http://priorartdatabase.com/prior-art-searching.html

[94] IP.com, "Searching Overview."

[95] IBM, "IBM Redbooks," (n.d.): http://www.redbooks.ibm.com/

[96] Research Disclosure, *An Overview of the Research Disclosure Publication Process*, (n.d.), 1: http://www.researchdisclosure.com/pdf-download/Research-Disclosure-Publication-Service.pdf

[97] WIPO, *Handbook on Industrial Property Information Documentation: Part 4 PCT Minimum Documentation*, (2010), 4.2.31: http://www.wipo.int/standards/en/pdf/04-02-01.pdf

[98] IP.com, "Non-Patent Literature Coverage," (2011): http://ip.com/resources/coverage-npl.html

[99] Research Disclosure, *An Overview of the Research Disclosure Publication Process*, 3; and, IP.com, "Journal Overview," (2011): http://priorartdatabase.com/prior-art-journal.html

[100] Defensive Publications, "Frequently Asked Questions," (n.d.): http://docs.defensivepublications.org/defensive-pubs-faqs

[101] Defensive Publications, "Frequently Asked Questions."

[102] Peer Patent, "Services," (n.d.): http://peerpatent.org/pages/services

[103] USPTO, *Manual of Patent Examining Procedure*, 8th ed. (2010), 700-224 (s. 711.06 III).

[104] *Patent Law Amendments Act of 1984*, s. 102, Pub. L. No. 98-622, 98 Stat. 3383.

[105] USPTO, *Manual of Patent Examining Procedure*, 8th ed. (2010), 1100-7 (s. 1111).

[106] 35 U.S.C. § 157 (c).

[107] USPTO, *Manual of Patent Examining Procedure*, 8th ed. (2010), 1100-14 – 1100-16 (s. 1122).

[108] *American Inventor Protection Act of 1999*, s. 4502; 35 U.S.C. § 122.

[109] USPTO, "Fee Schedule: Effective Sept. 26, 2011," (2011): http://www.uspto.gov/web/offices/ac/qs/ope/fee092611.htm

[110] USPTO, *Manual of Patent Examining Procedure*, 8th ed. (2010), 1100-7 (s. 1111).

[111] Merges, "A New Dynamism in the Public Domain," 195.

[112] Authors calculations based on data from: USPTO, "Issue Years and Patent Numbers," (2009): http://www.uspto.gov/patents/process/search/issuyear.jsp and adjusted for withdrawn SIR numbers available from: USPTO, "Withdrawn Patent Numbers, 1790 through 13 September 2011," (2011): http://www.uspto.gov/patents/process/search/withdrawn.jsp

[113] USPTO, *Statutory Invention Registrations and Defensive Publications January 1977 to December 2010*, (2011), A1-1: http://www.uspto.gov/web/offices/ac/ido/oeip/taf/sir.pdf

[114] USPTO, *Statutory Invention Registrations and Defensive Publications January 1977 to December 2010*, B-1.

[115] *Leahy-Smith America Invents Act*, s. 3.

[116] The survey has only 66 usable responses, and it is not clear which percentage of those firms were not counted in the question on publication venues because they do not defensively publish (Cockburn and Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*, I.1).

[117] Cockburn and Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*, I.1

[118] Henkel and Pangerl, Defensive Publishing," 27.

[119] Henkel and Pangerl, Defensive Publishing," 14-16, and 27.

[120] Henkel and Jell, "Alternative Motives to File for Patents," 4.

[121] Henkel and Pangerl, Defensive Publishing," 16.
[122] Johnson, "Defensive Publishing by a Leading Firm," 14.
[123] Cockburn and Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*, I.1.
[124] Henkel and Pangerl, Defensive Publishing," 28.
[125] IP.com, "Our Clients and Affiliates," (2011): http://ip.com/about/clients.html
[126] Research Disclosure, "Research Disclosure."
[127] IBM, "IBM Shatters U.S. Patent Record; Tops Patent List for 18th Consecutive Year," (10 Jan. 2011): http://www-03.ibm.com/press/us/en/pressrelease/33341.wss
[128] IBM, "IBM Shatters U.S. Patent Record; Will Openly Publish Many More Future Inventions; IBM Research to Work on Patent Quality Index," (14 Jan. 2009): http://www-03.ibm.com/press/us/en/pressrelease/26471.wss
[129] Henkel and Pangerl, Defensive Publishing," 2.
[130] USPTO, "Fee Schedule: Effective Sept. 26, 2011."
[131] USPTO, "Patent Dashboard," (July, 2011).
[132] IP.com, "Defensive Publishing," (2011): http://priorartdatabase.com/defensive-publishing.html
[133] USPTO, "Fee Schedule: Effective Sept. 26, 2011."
[134] The fee in the U.K. is £75, and for the rest of the world it is €80.
[135] Research Disclosure, "Publication Rates," (2011): http://www.researchdisclosure.com/publishing-disclosures/publication-rates
[136] IP.com, "Pricing," (2011): http://priorartdatabase.com/prior-art-pricing.html
[137] Research Disclosure, *An Overview of the Research Disclosure Publication Process*, 3; and IP.com, "Defensive Publishing."
[138] *In re Hall*, 781 F. 2d 897, (Fed. Cir. 1986), para. 3-4, and 27-28.
[139] Henkel and Pangerl, Defensive Publishing," 16.
[140] *Leahy-Smith America Invents Act*.
[141] *Leahy-Smith America Invents Act*, s. 5; and, 35 U.S.C. § 237.
[142] *Leahy-Smith America Invents Act*, s. 5; and, 35 U.S.C. § 237.
[143] Jason Rantanen, "The Effects of the *America Invents Act* on Technical Disclosure," *PatentlyO Blog*, (8 Sept. 2011): http://www.patentlyo.com/patent/2011/09/the-effects-of-the-america-invents-act-on-technological-disclosure.html
[144] Although the 2002 U.S. study revealed that these were not a popular avenue for defensive publication, the most recent empirical study of German firms found this to be the most common means of publication (Cockburn and Henderson, *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*, I.1; and, Henkel and Pangerl, Defensive Publishing," 27).
[145] IP.com, "Pricing."
[146] Research Disclosure, "Subscription Rates," (2011): http://www.researchdisclosure.com/searching-disclosures/subscription-rates
[147] IP.com, "Search for Technical Disclosures and Non-Patent Literature," (2011): http://priorartdatabase.com/search.html#legacy
[148] Research Disclosure, "Recent Disclosures," (2011): http://researchdisclosure.com/searching-disclosures/recent-disclosures
[149] Research Disclosure, "About the Database," (2011): http://researchdisclosure.com/searching-disclosures/about-the-database
[150] IBM, "IBM Shatters U.S. Patent Record," (2009).
[151] United States - National Economic Council, *A Strategy for American Innovation*, 42.
[152] Research Disclosure, "About the Database."
[153] IP.com, "Our Clients and Affiliates," (2011): http://ip.com/about/clients.html
[154] USPTO, "USPTO Patent Full-Text and Image Database," (20 Sept. 2011): http://patft.uspto.gov/netahtml/PTO/search-bool.html
[155] Peer to Patent, "Welcome to Peer to Patent."
[156] See chap. 5, s.I.B.
[157] Bell, *The Coming of Post-Industrial Society*, xiv.

[158] For example, George Lucas created the Star Wars universe and J.K. Rowling the Harry Potter world. While others have clearly had a role to play in helping distribute these ideas, it is much more difficult to argue that Bill Gates is the sole intellectual force behind Microsoft or Steve Jobs the only inventor at Apple.

[159] USPTO, "U.S. Patent Activity: Calendar Years 1790 to the Present."

Chapter Eight – Analysis, Discussion, Recommendations and Conclusion

This chapter concludes the dissertation beginning with an analysis of the case studies that examine whether the SAC proposal and defensive publishing constitute substantive alternatives to IP. It then assesses the expansionary regime drawing particular attention to the increasing signs of strain within the regime. The following sections review the Canadian and U.S. policy outlook before offering final conclusions, recommendations and questions for future research.

This chapter highlights several valuable insights that have been explicated in the course of the analysis. It notes that even in substantive alternatives a degree of self-interested incentives are still present, and offers the important clarification that the use of self-interested incentives can form a part of substantive alternatives to IP. It stresses the importance of access as both a normative dimension of substantive alternatives and as a means for allowing a greater range of innovation. It also emphasizes a crucial limit on substantive alternatives to IP, which is the fact that often they still rely on the IP system. These findings along with an assessment of the expansionary IP regime and Canadian and U.S. innovation policies inform the final conclusions and recommendations of the dissertation that greater federal support must be given to substantive alternatives to IP.

I. Analysis of the Case Studies

The two case studies, the SAC monthly ISP fee and defensive publishing, are illustrative of the diversity of alternatives to IP, and underscore several important strengths and limitations of these alternatives. The following section examines both case studies focusing on the incentive structures utilized, the innovatory outcomes, and the ideological aspects of each alternative.

A. Incentives and Self-Interest

The primary incentive for the production of intellectual goods under IP is the potential for

pecuniary gain facilitated by exclusionary rights. Both case studies demonstrate the primacy of self-interested motives; however, they differ in how pecuniary motives are emphasized. The SAC proposal is structured around monetizing file sharing (regardless of the mode of file sharing). This focus on pecuniary motives contrasts with defensive publication where corporations publish to ensure freedom to operate, reduce costs and prevent competitors from gaining a competitive advantage. In each case self-interested motives are primary, and in neither case is altruism or a concern for the public good the primary incentive.

The presence of self-interested incentives is not unique to these alternatives to IP. Although non-pecuniary in nature, an important set of incentives in FOSS and OA publishing are the desire for enhanced reputation and recognition. Prizes, while also having a reputational element, often include a pecuniary reward. A crucial question is how does the utilization of self-interested incentives, both pecuniary and reputational, undermine the desirability of alternatives to IP? In other words, is the suitability of alternatives to IP diminished because they are not incented on solely altruistic motives?

The thesis posits that substantive alternatives employ a range of incentive structures beyond pecuniary gain.[1] Based on the analysis of the case studies, the SAC's proposal clearly does not meet this standard given that its core principle is monetization. Defensive publishing clearly relies on self-interested motives such as ensuring freedom to operate, but not necessarily pecuniary ones. However, the analysis of incentives produced by IP in chapter four suggests that non-pecuniary, strategic incentives present in IP are manifested in defensive publishing. At no point has this analysis discussed an alternative that functions solely on altruistic motives, and as noted earlier[2] even altruistic behaviour can be considered self-interested. Based on these findings it is concluded that with regards to incentive structures, the differences between IP and the alternatives examined in this dissertation are differences in degree not kind as a degree of self-interest is always present. In light of this finding the original thesis must be revised. Successful and substantive alternatives to IP do rely on self-interested motives including pecuniary ones; however, such alternatives differ from IP and non-substantive alternatives such as the SAC proposal by making use of a greater range of non-pecuniary, self-interested

incentives including reputational motives. The potential for pecuniary gain is not the sole or dominant incentive, and exclusionary rights are not used to incent innovative activity.

The reliance on non-pecuniary self-interested incentives in substantive alternatives to IP on its own does not diminish the ability of such alternatives to alleviate the problem of the expansionary IP regime. While it may be possible to conceive of a world where intellectual goods are produced solely out of a desire to share such work with others and contribute to the public good, it would be impractical to suggest humans will engage in creative and inventive behavior only for altruistic purposes. Non-pecuniary incentives such as the desire for recognition serve an invaluable role facilitating the production and distribution of intellectual goods, and should be employed to help mitigate the problems of the commodification of intellectual work and the resulting diminution of access. Most importantly a de-emphasis on pecuniary incentives and the single minded pursuit of one's narrow, economic self-interest is crucial to promoting progressive change.

B. Access, Exclusion and Commodification

The second axis on which IP can be differentiated from its alternatives is the degree to which they facilitate access to intellectual works and the information contained within them. In the case of IP there is a clear limitation of access to a given work and to a lesser degree to the information contained (unlike secrecy where the informational content may never be revealed). The fair dealing/use exceptions and idea-expression dichotomy in copyright and disclosure requirement in patents ensure that the informational content of an intellectual good is not absolutely controlled by the IP owner, though IP rights provide generally effective controls to limit access to intellectual goods themselves.

The two case studies provide a greater degree of access than traditional IP mechanisms; however, they do not provide unlimited and unfettered access. The SAC proposal would significantly increase access to musical works, but stops short of actually allowing anything more than access (specifically the ability to create transformative new works). Defensive publication presents a much more complicated picture. For obscure disclosures access is greatly limited as the information is not likely to be found. In the case of IP.com and Research Disclosure access to the information has been commodified

by these firms. Some other defensive publication venues are accessible without cost (such as materials posted on the internet, corporate marketing materials, postings on factory gates, and SIRs), while in other cases (academic and trade publications) there remains a cost factor.

The lack of clarity regarding access among alternatives to IP is not unique to defensive publication. In the case of open source software access to the source code is always available, though the software itself may not be costless. Open access scholarly publications are made available without cost, but there may be restrictions on use. In both open source and open access even though one has access to the informational content, it does not imply that one necessarily has the skill or knowledge base to utilize the information made available. Prizes place the informational content in the public domain, but transforming that information into a physical good or service still contains a cost to produce or develop. Thus for many alternatives to IP, access is not completely unconditional; however, there is a marked difference in kind, not degree, between substantive alternatives and IP. The exclusionary rights of IP are principled upon limiting access without which the incentive function of IP would be impaired. Though some fetters on access remain in the case of alternatives, greater access is permitted. This difference is fundamental, and none of the alternatives examined within this study limit access in the same manner as IP. While there is heterogeneity with regards to how much access alternatives afford, as a group alternatives to IP provide a significantly greater degree of access to intellectual goods than IP. Providing access is crucial as it increases the potential for future innovation. More importantly access is normatively preferable to exclusion. The valuing of access in substantive alternatives is a crucial means by which the ideology of intellectual goods is resisted. Furthermore the privileging of access over exclusion is critical to facilitating innovation in social norms that is necessary to overcoming the ideology of neoliberalism.

C. Innovation and Progress

The third criterion on which IP and its alternatives can be demarcated is the kind of innovation they engender. IP-driven innovation is increasingly cast in terms of its ability

to generate wealth and productivity gains. The SAC's claim that their proposal is innovative because it will monetize and license activity that is copyright infringement does not differ from the discourse on IP in this regard. However, the SAC proposal does nothing to encourage innovative uses of existing musical works. The case of the SAC proposal contrasts with that of defensive publishing. The latter clearly facilitates innovation, but the examination of incentives underlying defensive publishing suggests that the social goal of progress is clearly secondary to enhancing one's competitive advantage. Though not the primary goal of defensive publication, such disclosures do encourage social progress by improving patent quality, and therefore limiting the granting of exclusionary rights to obvious and non-novel inventions. Furthermore, defensive publication can be used to encourage political, social, moral and environmental progress. When IBM announced in 2009 that it planned on increasing the number of technical inventions it would not protect with patents, it clearly stated that such inventions would be in the important social areas of health care, education, the environment, software interoperability, and open source software.[3] Of course this does not mean that all defensive publications are premised on addressing social problems, and it is notable that these are areas of technology where it may be more difficult to appropriate the outcomes, but it does reveal that defensive publishing can be, and is, aimed at more than just economic growth.

Other alternatives also demonstrate a concern for more than economic growth and enhanced productivity. While the mission of Creative Commons is clearly cast in economic terms ("to drive a new era of development, growth, and productivity,"[4]) the goal of enabling universal access to the world's research, education, and cultural materials clearly goes beyond these narrow, instrumentalist economic goals. In the biotechnology and health sectors prizes have been singled out by a number of proponents including the WHO as means for addressing diseases such as malaria and tuberculosis.[5] Other prizes such as those offered by the Clay Mathematics Institute or the U.S. Department of Energy's L Prize also address more than economic objectives.[6] While IP can serve broader social goals, rights holders have a tendency to treat exclusionary rights instrumentally as mechanisms for generating profits.

The thesis posits that substantive alternatives to IP emphasize innovation for more than its simple economic attributes. The SAC proposal should not be considered a substantive alternative because it fails to significantly differentiate itself from IP in this regard. Given its focus on a remunerative incentive and the suggestion that the proposal will generate profitable and innovative new business methods, it embodies the same ideological approach as IP. By comparison defensive publishing is a substantive alternative. While instrumentalist objectives are clearly important, they do not mitigate the fact that defensive publishing can also advance progress, and that one of the earliest and largest defensive publishers, IBM, clearly espouses this view. Conversely, while the SAC proposal allows greater access than copyright, its incentive structure and economic focus are largely identical to that of the IP regime. Conversely, defensive publishing is a substantive alternative to IP. Though it does bear some similarities with the IP system, it possesses significant differences that may result in not only increased access to intellectual goods but, more importantly, socially purposive uses of such informational goods and their intellectual content. However, while defensive publication is a substantive alternative to IP, it is crucial to note that it is not a substitute for IP as it necessarily relies on the patent system. The inability of defensive publishing and other substantive alternatives such as FOSS and OA publishing to function as substitutes for IP requires further attention and is dealt with in the next sub-section.

D. The Centrality of IP

A limitation of alternatives to IP is their indebtedness to intellectual property devices themselves. The private ordering scheme found in the SAC proposal still requires the copyright system. While it is possible that in the absence of artists, publishers and ISPs may partner in an effort to distribute music, the SAC proposal is only an alteration of the status quo, not a substantive alternative. Defensive publishing is also dependent on the patent system to create the incentives to defensively publish, and absent the presence of patents there is no clear indication of how or why defensive publishing would flourish given that secrecy would appear an attractive option for appropriating the returns of innovation. The 'open' alternatives to copyright, including FOSS and OA have been relatively successful,[7] but still require the combination of licenses and copyright to

function. Prizes, public financing, and patronage are capable of functioning as alternatives without having to rely on IP, but this fact is hardly surprising given that these alternatives have considerable historical roots. The centrality of IP to its alternatives forces supporters of alternatives to face a crucial question: how much support should be given to alternatives that can never fully displace the problem they are meant to address?

Ultimately the answer to such a question is dependent on one's normative view and ideology. If the primary purpose for supporting alternatives is to facilitate innovation, then the success of FOSS and OA suggests that the IP system must be tolerated. Patents and copyrights do spur innovation, though the maximalist approach does a poor job of recognizing the inherent incentives for the production and distribution of intellectual goods, IP's disincentive effects and the deadweight loss generated by exclusionary rights. Greater support for alternatives in addition to a more limited use of IP provides the policy framework most likely to generate the highest levels of innovation. This policy balance appears to present a further important question – what level of IP protection is necessary to incent the maximum level of innovative activity. However, this question is illusory as the minimum levels of protection spelled out in TRIPS, itself a product of the expansionary regime, should suffice particularly given the empirical evidence that IP is at best a moderate incentive for innovative activity.[8]

If the fundamental reason for advocating for alternatives to IP is to resist the logic of the commodification of intellectual labour then support for a range of alternatives to IP becomes more difficult. Many alternatives reject the logic of commodification, but not all do, and the SAC proposal in particular further reinforces the concept of commodifying intellectual work. However, by being reliant on the IP system alternatives such as FOSS, OA and defensive publishing can never fully prevent commodification. Furthermore, it has been posited that the greatest benefactors of intellectual goods whose access is not restricted are private corporations which can exploit the unpaid labour of others.[9] While alternatives to IP can resist commodification in varying degrees, without a completely different economic order profit seekers will always be able to exploit innovative activity for wealth production. Although it is possible to envision a world where intellectual goods are freely disseminated without restrictions on access or use, the current economic

order that focuses on wealth creation and its supporting neoliberal policy environment that extols private property and self-interest would have to be radically altered or entirely eliminated to see such a vision come to fruition.

Despite this important and inherent limitation on many substantive alternatives to IP, it does not diminish the value of such alternatives. In the long run the most valuable contribution of substantive alternatives is not their facilitating of innovation, but their ability to reject the normative and ideological dimensions of IP. A key factor in the ascendency of neoliberalism and instrumentalist economic thought has been the ability of its proponents to obtain ideological and normative adherents who view the commodification of intellectual work as what ought to be. Supporting substantive alternatives is not simply a means of encouraging greater levels of innovation. At its essence it is a way of advancing a different ideological and normative stance that values access, inclusion and progressive social change that can address the range of political, social, moral, environmental and economic problems facing humankind.

II. Analysis of the Expansionary IP Regime

The presence and increasing prominence of alternatives to IP has not abated the expansionary IP regime. However, there have been several recent defeats of expansionary measures and increasing signs that expansive IP protections are pitting not only countries that are net exporters of IP against those that are net importers, but also different economic sectors against each other. In the case of copyright, expansionist tendencies remain most pronounced. Both the Canadian and U.S. innovation policies stress greater protection for copyright and have pending legislation that would further strengthen copyright.[10] Copyright-based industry groups such as the IIPA, the Copyright Alliance in the U.S., and the Creators' Copyright Coalition in Canada are unified in calling for greater protections.[11] However, attention must also be drawn to the recent protests over the PROTECT IP Act and SOPA in the United States.[12] While rights holders were largely successful in the first decade of the 21st century in litigating against either end users or firms that have facilitated infringement by users (notably, Napster, Grokster, and LimeWire), the postponement and possible ultimate defeat of the

PROTECT IP Act and SOPA is due in part to the fact that such legislation was opposed by corporations increasingly important to the U.S. economy (e.g. Google, Amazon.com, Facebook). Although the PROTECT IP Act and SOPA appear to be defeated, nothing stops Congress from considering future bills with similar measures. Yet, when the push for expansionary IP legislation starts to threaten newly established, innovative companies Congress should not lose sight that the purpose of IP is to promote progress, not to further enrich entrenched corporations. Indeed, this view was advanced by the White House when it commented on the PROTECT IP Act and SOPA stating:

> While we believe that online piracy by foreign websites is a serious problem that requires serious legislative solutions, we will not support legislation that reduces freedom of expression, increases cybersecurity risk, or undermines the dynamic, innovative global internet[13]

As this quote demonstrates there is increasing recognition from the highest political office in the globe that the maximalist approach to copyright has its own upper limits – and that limit is imperiling innovation.

In the case of patents there are also indications that policymakers are recognizing that the goal of innovation is more important than IP as a means of achieving that goal. The U.S. has finally enacted long-awaited patent reform with a key aim of improving patent quality and weeding out lower quality patents.[14] The establishment of a burgeoning number of Peer to Patent programs supported by national patent offices[15] demonstrates that even national patent offices are aware that the expansionary regime has had negative effects including the creation of a massive application backlog and the approval of low quality patents. The fissuring of the expansionary consensus with respect to patents stems in part from the increasingly antagonistic set of legal battles between patent holders. Low quality patents, forum shopping, defensive and offensive patent aggregation, and the rise of non-practicing entities has resulted in a dizzying array of legal battles between firms claiming exclusionary rights over similar intellectual goods. The problem has become acute for smartphone and tablet computer manufactures, and provides an illustrative example of how the expansionary patent regime is dampening innovation.[16] The battles between Apple and Samsung in particular have been rancorous, but more

importantly the subject matter being contested is increasingly trivial. It is pure lunacy to have two major high technology companies devoting substantial resources to legal departments to argue whether a science fiction film constitutes prior art in a case involving a question of ownership on the ornamental design of a tablet computer in the shape of a rectangle (with rounded corners).[17] The problems in the smartphone/tablet sector are reflective of the cumulative nature of innovation in these areas – a smartphone may contain as many as 250,000 patented claims.[18] While patents are particularly well-suited for discrete products such as chemicals and pharmaceuticals, the case is not true for complex products. Although the simple solution would appear to be creating one class of patents for discrete products/sectors and another for complex products, TRIPS requires that patents be available in all fields of technology and not discriminate based on field of technology.[19] The result is the fissuring of the expansionary patent regime with the interests of the pharmaceutical and chemical sectors diverging from those of the information technology sector.[20]

The tensions created by IP and its ability to inhibit innovation underscore the need for alternatives. The patent system has demonstrated that the maximalist approach can become a significant barrier to innovation. In the case of copyright, the success of alternatives such as FOSS, OA, and other commons based 'open' alternatives underscores that such mechanisms will be increasingly important for providing access to intellectual goods. The limitations of the expansionist approach and the need for alternatives to IP must be a central dimension of information policy. Furthermore, governments must take a leadership role in supporting alternatives to IP. Bottom up approaches such as FOSS, OA, and defensive publishing (with the exception of the soon to be eliminated SIR program) can only go so far. Governments, themselves the source of IP rights, are integral to both developing and financing alternatives to IP that will limit the problems caused by the maximalist approach.

III. The Policy Outlook in Canada and the United States

The policy actions and outlooks by Canada and the United States differ sharply. Although the U.S. has been the locus of the expansionary IP regime, in recent years it has

demonstrated greater federal support for a range of alternatives to IP. The critical importance of alternatives to IP appears to be largely ignored by the Canadian government. While the pending copyright bill, Bill C-11, contains several provisions that would benefit users,[21] the pervasive protection given to TPMs not only undermines these new provisions but also destabilizes the crucial balance between users and creators rights by granting decoupling acts of TPM circumvention from acts of copyright infringement. The government should be commended for appealing the Federal Court decision in the Amazon.com ruling;[22] however, at the time of writing there has been no indication that the government will seek leave to appeal the Federal Court of Appeal decision to the Supreme Court. Ultimately, a statutory exclusion of business methods from patentability would be preferable. The government has also demonstrated a lack of leadership with respect to supporting alternatives to IP. There is still no Canadian peer to patent project despite numerous other nations advancing such initiatives.[23] Unlike the U.S., which mandates at least a degree of OA publishing through NIH funded projects,[24] there are no mechanisms in Canada to stipulate that federally funded research is made accessible. The long-awaited digital economy strategy has still not been unveiled, although the government has recently announced that it will reform the business R&D tax credit program.[25] Given the nation's increasingly poor innovation performance relative to other countries,[26] it is imperative that the government not only reform the corporate R&D tax credit, but also provide greater federal support for alternatives to IP. Canadian policymakers should look south, not in an effort to determine how to fashion greater expansionary IP rights, but to discover how greater federal support for alternatives to IP can strengthen the country's innovation ecosystem.

The policy outlook in the United States is considerably different than Canada. The Obama administration's innovation policy explicitly supports the use of prizes and the federal government has developed an extensive open data portal (data.gov).[27] Although the SIR program will be eliminated in 2013, it has already proven to be a failure.[28] It is logical that the nation that was the epicenter of the expansionary IP regime has recently turned to increased support for alternatives to IP. The increased policy support for alternatives reflects the fact that innovation is best achieved by a policy framework that utilizes a range of incentive structures for the production and distribution of intellectual

goods, not just an over-reliance on IP. However, the increased support for alternatives in the U.S. should not be viewed as a complete retreat from expansionary tendencies, especially with regard to the recent cases of both ACTA and SOPA.

While the U.S. government has done considerably more to support alternatives to IP, it is saddled with debt woes which have already undermined support for alternatives.[29] Furthermore, as demonstrated by SOPA, the PROTECT IP Act, the *Commercial Felony Streaming Act*, and the *Research Works Act* expansionary legislation continues to be introduced in Congress.[30] The Obama administration has clearly recognized that a thriving innovation ecosystem requires more than just IP, and the government has made a number of laudable steps in this direction. Furthermore, both the George W. Bush and Obama administrations should be credited for supporting innovation programs that addressed not only economic, but also social and environmental problems. However, future success appears to be imperiled by the U.S.'s inability to achieve fiscal stability.

IV. Conclusions

Intellectual property appears as a solution to the problem of incenting innovative activity. This dissertation neither challenges nor rejects this concept – IP is indeed an incentive for innovation. However, as the analysis has revealed, the framing of IP as *the* solution is highly problematic. Numerous incentives exist for the production and distribution of intellectual goods, and empirical studies have robustly demonstrated that IP is not the most preferred mechanism for appropriating the returns for innovation. IP also produces numerous dynamic effects beyond incenting innovative behaviour, particularly engendering the use of exclusionary rights for strategic purposes. Furthermore, the construction of IP – using exclusionary rights to generate pecuniary incentives – results in a narrow, instrumentalist approach to innovation which casts it in overly economic terms and fails to recognize the important connections between innovation, access to intellectual goods, and human progress. Finally, the inherent positive connotation of innovation has been adopted by several information society proponents and futurologists who often fail to fully appreciate the numerous negative consequences of IP. Concomitantly, innovation and information age rhetoric has been skillfully deployed by

corporations and governments to advance a neoliberal political agenda underpinned by neoclassical economic thought that disproportionately emphasizes wealth creation and productivity growth as the primary economic and social policy objective.

The analysis has also revealed that alternatives to IP can act as effective incentive mechanisms, but their effectiveness to incent innovation and ability to address more than economic objectives is not uniform. Some alternatives, such as the SAC's proposal, do not offer a substantive alternative to IP, while others such as defensive publishing, FOSS, OA, and prizes do. Substantive alternatives are effective because they utilize a broader range of incentive structures, facilitate greater access to intellectual works and their informational content, and stimulate innovative behaviour for more than simply economic purposes.

For policymakers the decision to continue expansionary trends or support alternatives is ultimately normative. If the primary goal is wealth creation, then IP is ideal. If innovation is to be maximized, augmenting the existing IP system with a significantly greater degree of support for substantive alternatives is necessary. If the goal is the complete rejection of the commodification of intellectual labour and the shaping of innovative activity for instrumentalist, economic purposes, then IP should be rejected as well as those alternatives that are forced to rely on the IP system. However, those who seek to reject substantive alternatives to IP which still have to rely on IP devices should be mindful of the fact that substantive alternatives serve a valuable purpose as a means of advancing a socially progressive normative viewpoint. Because governments are the creators of IP rights, they must also bear the responsibility for supporting alternatives if they desire more than wealth creation. Failure to provide greater support for alternatives will result in an exacerbation of the problems created by the expansionary IP regime and lead to greater economic stratification, decreased access to knowledge, the further entrenchment of dominant political powers and less innovation.

V. Recommendations and Questions for Future Research

The following section contains policy recommendations and questions for future research. The recommendations described are illustrative of the kinds of policies that

should be adopted, though it is not an exhaustive cataloguing of all possible policy recommendations. That being said, all of the recommendations follow from the general the analysis of IP and its alternatives that concludes greater support from governments must be given to alternatives of intellectual property, and more evidence-based policy is required in the area of innovation policy. Alternatives help mitigate the problems of the expansionary IP regime, and support for alternatives should be coupled with a cessation of the maximalist approach to IP rights.

i. Broadening Canadian Innovation Policy by Providing Greater Access to Information and a Larger Range of Incentives for Innovative Activity.

Canadian innovation policy is overwhelmingly targeted at incenting innovation in the business sector. While corporations have a crucial role to play in developing and commercializing innovations, Canadian innovation policy should be broadened to enable a greater range of creative and inventive activity. In this regard several steps should be taken: 1) the development of new guidelines that would require federally funded academic research to be published in an OA venue (akin to the NIH policy in the U.S.); 2) the expansion of fair dealing to cover not only education, parody and satire (as the pending Bill C-11 would do), but to also specifically allow transformative uses of copyrighted works; and 3) the establishment of a federal prize system (like challenge.gov in the U.S.) to allow Canadians to contribute innovative solutions to pressing economic, political, social, and environmental problems. Although Canadian policymakers should not blindly mimic what is done in the U.S., the Canadian government should keep a keen focus on what federal incentives the U.S. provides for producing and disseminating intellectual goods. The Canadian government should not disadvantage its own citizens by failing to support substantive alternatives to IP.

ii. Reintroduction and Passage of the *Federal Research Public Access Act* (FRPAA) in the United States

Congress has twice failed to pass the *Federal Research Public Access Act* that would ensure that billions of dollars in federally funded academic research be made accessible. Furthermore, in the latest Congress a version of FRPAA has not even been introduced.

Stemming from this recommendation, research is needed to determine why previous attempts to pass FRPAA have been unsuccessful and what, if any, changes to previous versions of FRPAA would be required to ensure future passage. Research in such regard will require both a careful examination of the bill's treatment in Congressional subcommittees and an analysis of lobbying efforts both for and against the bill.

iii. A New International Framework to Support Defensive Publishing

The impending abolition of the SIR program in the U.S. is not reflective of the fact that defensive publication remains an important and substantive alternative to patenting that encourages innovation. However, the commodification of the defensive publication by Research Disclosure and IP.com is troublesome. To address this concern an international program should be established that facilitates innovation. In this regard the major question for future research is how to achieve such a goal. As a starting point it would seem that WIPO would appear a potential body that could facilitate a defensive publishing system. Particular attention would have to be paid to how the program would be financed and how access to the disclosures would be ensured.

iv. Establishing a World Innovation Organization

Building on the previous recommendation that identified WIPO as a potential international organization that could undertake a global defensive publication system, serious consideration should be given to creating a World Innovation Organization that could coordinate support for alternatives to IP at an international level. This organization should be situated within the U.N., and would have to work closely with several U.N. bodies including WIPO, UNESCO, and the ITU. Alternatively, WIPO itself could be transformed into the World Innovation Organization.[31] A single, clearly identifiable, international organization to promote innovation would have the ability to draw attention to the importance of alternatives to IP in facilitating innovation. To further this recommendation more research would be needed to determine how such an organization should be structured relative to extant U.N. bodies and what process is necessary to create such an organization.

v. More Evidence-Based Innovation Policy

The final recommendation is that more evidence-based policy is needed in innovation policy in general and in the cases of IP and its alternatives in particular. While greater support for alternatives to IP is a starting point, it is only a guiding principle and only with more empirical information can policymakers truly formulate superior innovation policy. Greater empirical evidence and evidence-based policymaking is necessary to ensure that 21st century information policy is capable of stimulating innovative activity that will address the major political, social, economic and environmental problems facing the globe.

Notes to Chapter Eight:

[1] See chap. 1, s. IV.
[2] See chap. 1, s. V.C.
[3] IBM, "IBM Shatters U.S. Patent Record; Will Openly Publish Many More Future Inventions."
[4] Creative Commons, "About."
[5] WHO, *Public Health*, 104-06.
[6] See chpt. 1, n. 13
[7] See chap. 5, s. III.C.ii.
[8] See chap. 5, s. III.A.i.
[9] Hall, *Digitize This Book*, 187-193, Michael Gurstein, "Open Data: Empowering the Empowered or Effective Data Use for Everyone?" *First Monday*, 16(2), (2011): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/3316/2764 ; Klaus Hoeyer, Mette N. Svendsen and Lene Koch, "OECD Guidelines on Open Access: Commercialization in Disguise?" *Trends in Biotechnology*, 26(9), (2008), 461.
[10] See chap 6, s. I.A, and chap. 3, s.I.A.
[11] Creators' Copyright Coalition, "Creators Set Out Principles for Effective Copyright Reform;" Copyright Alliance, "Our Principles," (2008): http://www.copyrightalliance.org/content.php?id=43 ; and, International Intellectual Property Alliance (IIPA), "Description of the IIPA," (n.d.): http://www.iipa.com/aboutiipa.html
[12] See chap. 3, s. IV.
[13] Victoria Espinel, Aneesh Chorpa, and Howard Schmidt, "Combatting Online Piracy while Protecting an Open and Innovative Internet," (2012): https://wwws.whitehouse.gov/petitions#!/response/combating-online-piracy-while-protecting-open-and-innovative-internet
[14] For a discussion of some of the aspects of the *Leahy-Smith America Invents Act* see chap. 3, s. IV.
[15] See chap. 5 s. III.A.iii.
[16] See chap. 5, s. III.C.i.
[17] See chap. 5 s. III.C.i.
[18] Richard Waters, "Patent Hunting is the Latest Game on the Tech Bubble Circuit," *The Globe and Mail*, (27 Jul. 2011): http://www.theglobeandmail.com/globe-investor/patent-hunting-is-latest-game-on-tech-bubble-circuit/article2111870/
[19] TRIPS, art. 27(1).
[20] Kahin, "Patents and Diversity in Innovation," 389
[21] See chap. 3, s. IV.
[22] See chap. 3, s. III.B.
[23] See chap. 5 s. III.A.iii.
[24] See chap. 6, s. I.A.i.
[25] See chap. 6, s. I.A.ii.
[26] See chap. 6, s. I.A.ii.

[27] See chap. 6, s. I.A.i.
[28] See chap. 7, s. II.A.iii.
[29] See chap. 6, s. I.A.i.
[30] See chap. 3, s. IV, and chap. 6, s. I.A.i.
[31] See chap. 6, s. I.C.iii.

Bibliography

Legislation

Note: This section includes legislation that has already been enacted, is pending and some bills not passed into law.

Canada

Bill C-11, *An Act to Amend the Copyright Act*, 1st Sess, 41st Parl, 2011 (second reading 13 Feb., 2012).

Bill C-32, *An Act to Amend the Copyright Act* , 3rd Sess., 40th Parl., 2010 (not passed).

Bill C-60, *An Act to Amend the Copyright Act*, 1st Sess., 38th Parl., 2005 (not passed).

Bill C-61, *An Act to Amend the Copyright Act*, 2nd Sess., 39th Parl., 2008 (not passed).

Constitution Act, 1867 (UK), 30 & 31 Vict, c. 3, reprinted in RSC 1985, App II No. 5.

Copyright Act, (RSC 1985, c. C-42).

Patent Act, (RSC 1985, c. P-4).

United States

A Bill to Amend the Criminal Penalty Provision for Criminal Infringement of a Copyright, and for Other Purposes, S 978, 112th Cong, 1st Sess (12 May, 2011).

American Inventor Protection Act of 1999. Pub. L. No. 106-113, 113 Stat. 1501.

An Act to Amend the Patent and Trademark Laws, Pub. L. No. 96-517, 94 Stat 3015, 2028.

Berne Convention Implementation Act of 1988, Pub. L. No. 100-568, 102 Stat. 2853.

Consolidated Appropriations Act of 2008, Pub. L. No. 101-161, 121 Stat. 1843.

Copyright Act (17 U.S.C. § 1-1332).

Copyright Act of 1976, Pub. L. No. 94-553, 90 Stat. 2541.

Digital Millennium Copyright Act (DMCA), 1998, Pub. L. No. 105-304, 112 Stat. 2860

Digital Theft Deterrence and Copyright Damages Improvement Act of 1999, Pub. L. No. 106-160, 113, Stat. 1774.

Drug Price Competition and Patent Term Restoration Act (1984), Pub. L. No. 98-417, 98 Stat. 1584.

Federal Research Public Access Act (FRPAA) (2006), S 2695, 109th Cong, 2nd Sess., (2 May, 2006) (not passed).

Leahy-Smith America Invents Act, 2011, Pub. L. No. 112-29, 125 Stat. 284.

No Electronic Theft (NET) *Act*, 1997, Pub L. No. 106-147, 111 Stat. 2678.

Patent Act (35 U.S.C. § 1-376).

Patent Law Amendments Act of 1984, Pub. L. No. 98-622, 98 Stat. 3383.

Piracy and Counterfeiting Amendments Act of 1982, Pub. L. No. 97-180, 96 Stat. 91.

Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property Act of 2011, S 968, 112th Cong, 1st Sess (12 May, 2011).

Prioritizing Resources and Organization for Intellectual Property (PRO-IP) *Act*, 2008, Pub. L. No. 110-403, 122 Stat. 4256.

Research Works Act, (2011), HR 3699, 112th Cong, 1st Sess., (16 Dec., 2011).

Semiconductor Chip Protection Act of 1984, Pub. L. No. 98-620, 98 Stat. 3335.

Sonny Bono Copyright Term Extension Act, 1998, Pub. L. No. 105-298, 112 Stat. 2827.

Stevenson-Wydler Technology Innovation Act of 1980, Pub. L. No. 96-480, 94 Stat. 2311.

Stop Online Piracy Act (SOPA), HR 3261, 112th Cong, 1st Sess, (26 Oct., 2011).

Tariff Act of 1930 (19 U.S.C. § 1337).

U.S. Constitution, art. 1, s. 8, cl. 8.

University and Small Business Patent Procedures (Bayh-Dole) Act, 1980, Pub. L. No. 96-517, 94 Stat. 3019.

Uruguay Round Agreements Act, 1994, Pub. L. No. 104-465, 108 Stat. 4809.

Vessel Hull Design Protection Act, Title V of the DMCA, 1998.

Other Jurisdictions

Copyright, Designs and Patents Act of 1988 [United Kingdom], c. 48.

Council of the European Communities. Council Directive 93/98/EEC of 29 October 1993 harmonizing the term of protection of copyright and certain related rights. *Official Journal* L 290, 24/11/1993, 9-13.

Council of the European Communities. Directive 96/9/EC of the European Parliament and the Council of 11 March 1996 on the legal protection of databases. *Official Journa*l L 77, 27/03/1996, 20-28.

Council of the European Communities. Council Regulation (EEC) No. 1576/89 of 29 May 1989 laying down general rules on the definition, description and presentation of spirit drinks. *Official Journal*, L 106, 12/6/1989, 1-17.

Council of the European Communities. Council Regulation (EEC) No. 1768/92 of 18 June 1992 Concerning the Creation of a Supplementary Protection Certificate for Medicinal Products. *Official Journal*, L 182, 02/07/1992, 1-5.

Council of the European Communities. Council Regulation (EEC) No. 2081/92 of 14 July 1992 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. *Official Journal*, L 208, 24/07/1992, 1-8

European Parliament and the Council of the European Union. Directive 98/44/EC of the European Parliament and the Council of 6 July 1998 on the legal protection of biological inventions. *Official Journal*, L 213, 30/7/1998, 13-21.

European Parliament and the Council of the European Union. Directive 2001/29/EC of the European Parliament of the Council of 22 May 2001 On the Harmonization of Certain Aspects of Copyright and Related Rights in the Information Society. *Official Journal*, L 167, 22/6/2001, 10-19.

European Parliament and the Council of the European Union. Directive 2006/116/EC of the European Parliament and the Council of 12 December 2006 on the term of protection of copyright and related rights. *Official Journal*, L 372, 27/12/2006, 12-18.

European Parliament and Council of the European Union. Regulation (EC) No. 1610/96 of the European Parliament and the Council of 23 July 1996 Concerning the Creation of a Supplementary Protection Certificate for Plant Protection Products. *Official Journal*, L 198, 8/8/1996, 30-35.

Mexico - Decreto por el que se reforma la Ley Federal del Derecho de Auto del 30 abril de 2003[Decree Amending the Federal Copyright Law of April 30, 2003], DOF 23-07-2003.

<u>Jurisprudence</u>

Canada

Amazon.com, Inc. v. Canada (Attorney General), [2010] 4 FCR 541, 2010 FC 1011.

BMG Canada Inc. v. John Doe, [2004] 3 FCR 241, 2004 FC 488.

BMG Canada Inc. v. John Doe, [2005] 4 FCR 81, 2005 FCA 193.

Canada (Attorney General) v. Amazon.com, Inc., 2011 FCA 328 (2011).

CCH Canadian Lt. v. Law Society of Upper Canada, [2004] 1 S.C.R. 339, 2004 SCC 13.

Harvard College v. Canada (Commissioner of Patents), [2002] 4 S.C.R. 45, 2002 SCC 76.

Théberge v. Galerie d'Art du Petit Champlain inc., [2002] 2 S.C.R. 336, 2002 SCC 34.

United States

A&M Records, Inc., v. Napster, Inc., 239 F. 3d 1004 (2001).

Arista Records LLC v. Lime Group LLC, 715 F. Supp. 2d 481 (2010).

Bilski v. Kappos, 561 U.S. ____, 130 S. Ct. 3218 (2010).

Cochrane v. Deener, 94 U.S. 780 (1876)

Diamond v. Diehr, 450 U.S. 175 (1981).

eBay Inc. v. MercExchange, LLC,. 547 U.S. 388 (2006).

Eldred, et al. v. Aschroft, Attorney General, 537 U.S. 186 (2001).

Fox Film Corp. v. Doyal, 286 U.S. 123 (1932).

Gottschalk v. Benson 409 U.S. 63 (1972).

Graham v. John Deere Co., 383 U.S. 1 (1966).

Feist Publications, Inc., v. Rural Telephone Service Co., 499 U.S. 340 (1991).

Harper & Row v. Nation Enterprises, 471 U.S. 539 (1985).

In re Alappat, 33 F. 3d 1526, (Fed. Cir., 1994).

In re Bilski, 545 F. 3d 943, (Fed. Cir. 2008).

In re Hall, 781 F. 2d 897, (Fed. Cir. 1986).

Kendall v. Winsor, 62 U.S. 322 (1858).

KSR International Co. v. Teleflex Inc., 550 U.S. 398 (2007).

Laboratory Corporation of America Holdings v. Metabolite Laboratories, Inc., 548 U.S.

124, (2006).

Metro-Goldwyn-Mayer Studios, Inc., v. Grokster, Ltd., 545 U.S. 913 (2005).

Pennock & Sellers v. Dialogue, 27 U.S. 1 (1829).

Polaroid Corp. v. Eastman Kodak Co., DC Mass, 16 USPQ2d 1481 (1990).

Sony Corp. of America v. Universal City Studios, Inc., 464 U.S. 417 (1984).

State Street Bank & Trust Co., v. Signature Financial Group, Inc., 149 F. 3d 1368, (Fed. Cir., 1998).

Twentieth Century Music Corp. v. Aiken, 422 U.S. 151 (1975).

Other Jurisdictions

Patents

Canada

Leder, Philip, and Timothy A. Stewart. 1985. Transgenic Animals. Canadian Patent 1341442, filed June 21, 1985, and issued Oct. 7, 2003.

United States

Alsheimer, Keith A., and Andrianne H. Fitzgerald. 1997. Building block training systems and training methods. US Patent 5,851,117, filed Apr. 23, 1997, and issued Dec. 22, 1998.

Amiss, Kevin T. and Martin H. Abbot. 1993. Method of Exercising a Cat. US Patent 5,443,036, filed Nov. 3, 1993, and issued Aug. 22, 1995.

Boes. R. Todd. 1991. Data Processing System for Hub and Spoke Financial Services Configuration. US Patent 5,193,056, filed Mar. 11, 1991, and issued Mar. 9, 1993.

Hartman, Peri, Jeffery P. Bezos, Shel Kaphan, and Joel Spiegel. 1997. Method and system for placing a purchase order via a communications network. US Patent 5960411, filed Sept. 12, 1997, and issued Sept. 28, 1999.

Leder, Philip ,and Timothy A. Stewart. 1980. Transgenic Non-human Mammals. US Patent 4,736,866, filed June 22, 1984, and issued April 12, 1988.

Miller, Dale D. 1996. Method of Putting. US Patent 5,616,089, filed Mar. 29, 1996, and issued Apr. 1 1997.

Olson, Steven. 2000. Method of Swinging on a Swing. US Patent 6,368,227, filed Nov. 17, 2000, and issued Apr. 9, 2002.

Yeh, Wen-Ya. 1999. Both Hand Hair Cutting Method, US Patent 6,257,248, filed Dec. 10, 1999, and issued Jul. 10, 2001.

Other Jurisdictions

Leder, Philip, and Timothy A. Stewart. 1985. Transgenic Animals. European Patent 0169672, filed June 24, 1985, and issued May 13, 1992.

International Agreements

Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), 15 Apr., 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 UNTS 299.

Anti-Counterfeiting Trade Agreement (ACTA) 2011.

Australia – U.S. Free Trade Agreement, 2004.

Bahrain – U.S. Free Trade Agreement, 2004.

Berne Convention for the Protection of Literary and Artistic Works, Sept. 9 1886, as revised at Paris on July 24, 1971 and amended in 1979, 1161 UNTS 3.

Canada - United States Free Trade Agreement, 1988.

Chile – U.S. Free Trade Agreement, 2003.

Convention Establishing the World Intellectual Property Organization, July 14, 1967, amended Sept. 28, 1979, 828 UNTS 3.

Convention on the Grant of European Patents (European Patent Convention), 5 Oct., 1973, 1065 UNTS, 199.

Columbia – U.S. Free Trade Agreement, 2006.

Dominican Republic – Central American Free Trade Agreement (CAFTA-DR), 2004.

Final Act Embodying the Results of the Uruguay Round of Multilateral Negotiations (Marrakesh Agreement), 15 Apr., 1994, 1867 UNTS 14.

Jordan – U.S. Free Trade Agreement, 2000.

Korea – U.S. Free Trade Agreement, 2007.

Morocco – U.S. Free Trade Agreement, 2004.

Nairobi Treaty on the Protection of the Olympic Symbol, Sept. 26, 1981, 1863 UNTS 367.

North American Free Trade Agreement (NAFTA), 17 Dec., 1992, 1993, 32 ILM, 289, (1993).

Oman – U.S. Free Trade Agreement, 2006.

Panama – U.S. Trade Promotion Agreement, 2006.

Peru – U.S. Free Trade Agreement, 2006.

Singapore – U.S. Free Trade Agreement, 2003.

Treaty on Intellectual Property in Respect of Integrated Circuits (Washington Treaty), 26 May, 1989.

Understanding on Rules and Procedures Governing the Settlement of Disputes, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 2, 1869 UNTS 401.

Union internationale pour la Protection des Obtentions Végétale (UPOV) [International Convention for the Protection of New Varieties of Plants], 2 Dec., 1961, revised 23 Oct., 1978, 1861 UNTS 281.

WIPO Copyright Treaty (WCT), 20 Dec., 1996, 36 ILM 65.

WIPO Performances and Phonograms Treaty (WPPT), 20 Dec., 1996, 36 ILM 76.

Other Materials

Abramowicz, Michael. 2003. "Perfecting Patent Prizes." *Vanderbilt Law Review*, 56: 115-236.

Abrams, Jim. 2012. "U.S. Postpones Vote on Anti-Piracy Law." *The Globe and Mail*, (21 Jan.): http://www.theglobeandmail.com/news/technology/tech-news/us-postpones-vote-on-anti-piracy-law/article2309233/

Adams, Stephen and Victoria Henson-Apollonio. 2002. "Defensive Publishing: A Strategy for Maintaining Intellectual Property as Public Goods*." International Service for National Agricultural Research Briefing Paper*, 54: 1-8.

Akerlof, George A., Kenneth J. Arrow, Timothy F. Bresnahan, James M. Buchanan, Ronald H. Coase, Linda R. Cohen, Milton Friedman, Jerry R. Green, Robert W. Hahn, Thomas W. Hazlett, C. Scott Hemphill, Robert E. Litan, Roger G. Noll, Richard Schmalensee, Steven Shavell, Hal R. Varian and Richard J. Zeckhauser. 2002. Brief *Amici Curiae* in Support of the Petitioners. *Eldred et al, v. Ashcroft, Attorney General*, 122 S.Ct. 1170 (2002) (No 01-618).

Allison, Cathy. 2004. "The Challenges and Opportunities of Online Music: Technology Measures, Business Models, Stakeholder Impact and Emerging Trends." (Ottawa:

Department of Canadian Heritage: http://dsp-psd.pwgsc.gc.ca/Collection/CH36-4-2-2004E.pdf

Allison, John R., Mark A. Lemley, and Joshua Walker. 2009. "Extreme Value or Trolls on Top? The Characteristics of the Most Litigated Patents." *University of Pennsylvania Law Review*, 158(1): 1-37.

Amabile, Teresa M. 1996. *Creativity in Context: Update to The Social Psychology of Creativity*. Boulder, CO: Westview, 1996.

"Amendment to the Patent Laws." 1851. *The Economist*. 26 July 1851: 3-4.

American Association for the Advancement of Science. 2007. *International Intellectual Property Experiences: A Four Country Report*. http://sippi.aaas.org/Pubs/SIPPI_Four_Country_Report.pdf

American Inventors for Patent Reform. N.d. "The Role of Patents and the Need for Patent Reform." http://www.aminn.org/patent-issues

Andersen, Birgitte and Marion Frenz. 2007. *The Impact of Music Downloads and P2P File-Sharing on the Purchase of Music: A Study for Industry Canada*. http://www.ic.gc.ca/eic/site/ippd-dppi.nsf/vwapj/industrycanadapapermay4_2007_en.pdf/$file/industrycanadapapermay4_2007_en.pdf

Antelman, Kristin. 2004. "Do Open-Access Articles Have a Greater Research Impact?" *College and Research Libraries*, 65(5): 372-382.

Apple. 2011. "What is iTunes?" http://www.apple.com/itunes/what-is/

Archer, Margaret. 1990. "Theory Culture and Post-Industrial Society." In *Global Culture: Nationalism, Globalization and Modernity*, Mike Featherstone (Ed.), London: Sage, 1990, 97-120.

Arewa, Olufunmilayo B. 2006. "Copyright on Catfish Row: Musical Borrowing, *Porgy and Bess*, and Unfair Use." *Rutgers Law Journal*, 37(2): 277-353.

Arora, Ashish, Marco Ceccagnoli and Wesley M. Cohen. 2008. "R&D and the Patent Premium." *International Journal of Industrial Organization*, 26: 1153-1179.

Arrow, Kenneth J. 1962. "Economic Welfare and the Allocation of Resources for Invention." In *The Rate and Direction of Incentive Activity: Social and Economic Factors*. Princeton: Princeton University Press: 609-626;

Arrow, Kenneth J. 1986. "Rationality of Self and Others in an Economic System," *The Journal of Business*, 59(4) part 2:S385-S399.

Arrow, Kenneth J., Ian Ayres, Gary Becker, William M. Landes, Steven Levitt, Douglas

Lichtman, Kevin Murphy, Randal Picker, Andrew Rosenfield, and Steven Shavell, Brief of *Amici Curiae* in Support of the Petitioners. *Metro-Goldwyn-Mayer Studios, Inc., v. Grokster, Ltd*., 380 F. 3d 1154 (9th Cir., 2004).

Arrow, Kenneth J., and Gerard Debreu. 1954 "Existence of an Equilibrium for a Competitive Economy." *Econometrica*, 22(8): 265-290.

Arthur, W. Brian. 1994. *Increasing Returns and Path Dependence in the Economy*. Ann Arbor, MI: University of Michigan Press.

Arundel, Anthony. 2001. "The Relative Effectiveness of Patents and Secrecy for Appropriation." *Research Policy*, 30: 611-624.

Arundel, Anthony and Isabelle Kabla. 1998. "What Percentage of Innovations are Patented? Empirical Estimates for European Firms." *Research Policy*, 27: 127-141.

Association of University Technology Managers. 2010. *AUTM U.S. Licensing Activity Survey Highlights: FY2009*: http://www.autm.net/AM/Template.cfm?Section=Documents&Template=/CM/ContentDisplay.cfm&ContentID=5880

Atwood, Margaret. 2002. *Negotiating with the Dead: A Writer on Writing*. Cambridge: Cambridge University Press.

Bachman, Randy. N.d. "Randy Bachman on the Songwriters Association of Canada's File-Sharing Proposal." (Video): http://www.songwriters.ca/songwritersperspectives.aspx

Bacon, Francis. 1912. "Of Innovations." In *Bacon's Essays*. Sydney Ed. Sydney Humphries (Ed.). London: Adam and Charles Black, 132-134.

Bagehot, Walter. 1911. *Economic Studies*. Richard Holt Hutton (Ed.). London: Longmans, Greens and Co.

Bailey, Jr., Charles W. 2006. "What is Open Access." In *Open Access: Key Strategic, Technical and Economic Aspects*. Neil Jacobs, (Ed.), Oxford: Chandos: 13-26.

Baker, Matthew J. and Brendan M. Cunningham. 2009. "Law and Innovation in Copyright Industries." *Review of Economic Research on Copyright Issues*, 6(1): 61-82.

Baker, Scott and Claudio Mezzetti. 2004. "Disclosure as Strategy in the Patent Race." *Journal of Law and Economics*, 48: 173-194.

Baldwin, John. 1997. *Innovation and Intellectual Property*. Statistics Canada Cat. No. 88-515XPE. Ottawa, ON: Statistics Canada.

Baldwin, John, Petr Hanel and David Sabourin. 2000. "Determinants of Innovative

Activity in Canadian Manufacturing Firms: The Role of Intellectual Property Rights," *Statistics Canada Analytical Studies Branch Research Paper*, 122, (2000): http://www.statcan.gc.ca/pub/11f0019m/11f0019m2000122-eng.pdf

Bar, Talia. 2006. "Defensive Publications in a R&D Race." *Journal of Economics and Management Strategy*, 15(1): 229-254.

Bar-Gill, Oren and Gideon Parchomovsky. 2003. "The Value of Giving Away Secrets." *Virginia Law Review*, 89(8): 1857-1895.

Barrett, Bill. 2002. "Defensive Use of Publications in an Intellectual Property Strategy." *Nature Biotechnology*, 20: 191-193.

Baumol. William J. 2002. *The Free-Market Innovation Machine: Analyzing the Growth Miracle of Capitalism.* Princeton, NJ: Princeton University Press.

Becker, Gary S. 1990. *The Economic Approach to Human Behavior*. Chicago: University of Chicago Press.

Becker, Gary S. and Richard A. Posner. 2009. *Uncommon Sense*. Chicago: University of Chicago Press.

Bell, Daniel. 1978. *The Cultural Contradictions of Capitalism*. New York: Basic Books.

Bell, Daniel. 1980. "The Social Framework of the Information Society." In *The Microelectronics Revolution: The Complete Guide to the New Technology and Its Impacts on Society*. Tom Forester, (Ed.), Oxford: Basil Blackwell: 500-549.

Bell, Daniel. 1999. *The Coming of Postindustrial Society: A Venture in Social Forecasting*. Spec. Anniv. Ed. New York: Basic Books.

Benkler, Yochai. 2002. "Coase's Penguin: Linux and *The Nature of the Firm*." *Yale Law Journal*, 112: 369-446.

Benkler, Yochai. 2006. *The Wealth of Nations: How Social Production Transforms Markets and Freedom*. New Haven, CN: Yale University Press.

Benkler, Yochai. 2003. "The Political Economy of the Commons." *Upgrade*, 4(3): 1-9.

Bentham, Jeremy. 1843. *The Works of Jeremy Bentham*. Vol. 2. John Bowring (Ed.). Edinburgh: Simpkin, Marshall and Co.

Bentham, Jeremy. 1843. *The Works of Jeremy Bentham*. Vol. 3. John Bowring (Ed.). Edinburgh: Simpkin, Marshall and Co.

Besen, Stanley M. and Leo J. Raskind. 1991. "An Introduction to the Law and Economics of Intellectual Property," *Journal of Economic Perspectives*, 5(1): 3-27.

Bessen, James, and Robert M. Hunt. 2004. "An Empirical Look at Software Patents."

Federal Reserve Bank of Philadelphia Working Paper, 03-17/R: 1-53.

Bessen, James, Jennifer Ford and Michael J. Meurer. 2011. "The Private and Social Costs of Patent Trolls." *Boston University School of Law Working Paper*, No. 11-45: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1930272

Bessen, James, and Michael J. Meurer. 2008. *Patent Failure: How Judges, Bureaucrats and Lawyers Put Innovators at Risk*. Princeton, NJ: Princeton University Press.

Bessen, James E. and Michael J. Muerer. 2008. "The Private Costs of Patent Litigation." *Boston University School of Law: Law and Economics Working Paper*, 07-08: http://ssrn.com/abstract=983736

Blind, Knut, Jakob Edler, Rainer Frietsch and Ulrich Schmoch. 2006. "Motives to Patent: Empirical Evidence from Germany." *Research Policy*, 35: 655-672.

Boettiger, Sara. 2007. "Issues in IP Management to Support Open Access in Collaborative Innovation Models." *First Monday*, 12(6): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/rt/printerFriendly/1869/1752

Boiller, David. 2007. "The Growth of the Commons Paradigm." In *Understanding Knowledge as a Commons: From Theory to Practice*. Charlotte Hess and Elinor Ostrom, Eds. Cambridge, MA: MIT Press: 27-40.

Boyle, James. 1996. *Shamans, Software and Spleens: Law and the Construction of the Information Society*. Cambridge, MA: Harvard University Press.

Boyle, James. 2000. "Cruel, Mean, or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property," *Vanderbilt Law Review*, 53: 2007-2039.

Boyle, James. 2000. "Introduction: A Nondelegation Doctrine for the Digital Age?" *Duke Law Journal*, 50: 5-16.

Boyle, James. 2002. "Fencing off Ideas: Enclosure and the Disappearance of the Public Domain." *Daedalus*, Spring: 13-25.

Boyle, James. 2003. "The Second Enclosure Movement and the Construction of the Public Domain." *Law and Contemporary Problems*, 66: 33-74.

Boyle, James. 2008. *The Public Domain: Enclosing the Commons of the Mind*. New Haven, CN: Yale University Press.

Bradshaw, York and Michael Wallace. 1991. "Informing Generality and Explaining Uniqueness: The Place of Case Studies in Comparative Research." In *Issues and Alternatives in Comparative Social Research*. Charles C. Ragin Ed. Leiden: E.J. Brill: 154-171.

Braman, Sandra. 2006. *Change of State: Information, Policy, and Power*. Cambridge, MA: MIT Press.

Branstetter, Lee G., and Mariko Sakakibara. 2001. "Do Stronger Patents Induce More Innovation? Evidence from the 1988 Japanese Patent Law Reforms." *Carnegie Mellon University Department of Social and Decision Science*, Paper 45: http://repository.cmu.edu/sds/45

Brimelow, Alison. 2010. "'Not Seeing the Woods for the Trees': Is the Patent System Still Fit for Purpose?" Second Annual Francis Gurry Lecture, University of Melbourne, Melbourne Australia, (1 Mar. 2010): http://documents.epo.org/projects/babylon/eponet.nsf/0/94DC50B78360225EC12576DB00301EC2/$File/francis_gurry_lecture_master_en.pdf

Bronk, Richard. 1999. *Progress and the Invisible Hand: The Philosophy and Economics of Human Advance*. London: Warner Books.

Brown, Jesse. 2011. "Grand Theft Tax Break." *Macleans*, (13 Sept.): http://www2.macleans.ca/2011/09/13/grand-theft-tax-break/

Brown, Michael. 2003. *Who Owns Native Culture*. Cambridge, MA: Harvard University Press.

Brynjolfsson, Erik. 1993. "The Productivity Paradox of Information Technology." *Communications of the ACM*, 36(12): 67-77

Brynjolfsson, Erik and Adam Saunders. 2010. *Wired for Innovation: How Technology is Reshaping the Economy.* Cambridge, MA: MIT Press

Brynjolfsson, Erik, and Xiaoquan (Michael) Zhang. 2006. "Innovation Incentives for Information Goods," *Innovation Policy and the Economy*, 7: 99-123.

Buchanan, James M. and Yong J. Yoon. 2000. "Symmetric Tragedies: Commons and Anticommons." *Journal of Law and Economics*, 43: 1-13.

Burke, Dan L., and Mark A. Lemley. 2002. "Is Patent Law Technology-Specific?" *Berkeley Technology Law Journal*, 17: 1155-1206.

Business Software Alliance (BSA). 2010. *Seventh Annual BSA/IDC Global Software: 09 Piracy Study*. http://portal.bsa.org/globalpiracy2009/studies/globalpiracystudy2009.pdf

Cameron, Judy and W. David Pierce. 1994. "Reinforcement, Reward, and Intrinsic Motivation: A Meta-Analysis." *Review of Educational Research*, 64(3): 363-423.

Canada. 2007. *Mobilizing Science and Technology to Canada's Advantage*: http://www.ic.gc.ca/eic/site/ic1.nsf/vwapj/SandTstrategy.pdf/$file/SandTstrategy.pdf

Canada. 2008. *Compete to Win: Final Report*. Competition Policy Review Panel. http://www.ic.gc.ca/eic/site/cprp-gepmc.nsf/vwapj/Compete_to_Win.pdf/$FILE/Compete_to_Win.pdf

Canada. 2010. *Improving Canada's Digital Advantage: Strategies for Sustainable Prosperity*. http://dsp-psd.pwgsc.gc.ca/collections/collection_2010/ic/Iu4-144-2010-eng.pdf

Canada. 2011. *Innovation Canada: A Call to Action*. Review of Federal Support to Research and Development – Expert Panel Report. http://rd-review.ca/eic/site/033.nsf/vwapj/R-D_InnovationCanada_Final-eng.pdf/$FILE/R-D_InnovationCanada_Final-eng.pdf

Canada. 2011. "Open Data Pilot Project." http://www.data.gc.ca/default.asp?lang=En&n=F9B7A1E3-1

Canada. 2011. *Speech from the Throne: Here for All Canadians*. (3 June): http://www.speech.gc.ca/local_grfx/docs/sft-ddt-2011_e.pdf

Canada - House of Commons – Standing Committee on Canadian Heritage. 2010. "Evidence: Thursday, October 28, 2010." 40th Parl., 3rd sess.: http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4740661&Language=E&Mode=1&Parl=40&Ses=3

Canada – House of Commons – Legislative Committee on Bill C-32. 2011. "Evidence: Tuesday, March 1, 2011." 40th Parl. 3rd sess.: http://www.parl.gc.ca/HousePublications/Publication.aspx?DocId=4998663&Mode=1&Parl=40&Ses=3&Language=E

Canada – Science, Technology and Innovation Council. 2011. *State of the Nation 2010 – Canada's Science, Technology and Innovation System: State of the Nation 2010*: http://www.stic-csti.ca/eic/site/stic-csti.nsf/vwapj/10-059_IC_SotN_Rapport_EN_WEB_INTERACTIVE.pdf/$FILE/10-059_IC_SotN_Rapport_EN_WEB_INTERACTIVE.pdf

Canada Foundation for Innovation. 2010. "CFI Overview." http://www.innovation.ca/en/about-the-cfi/cfi-overview

Canadian Intellectual Property Office (CIPO). 2009. "About Intellectual Property: The Role of IP." http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr00332.html

CIPO. 2010. *Manual of Patent Office Practice*. 1998 Ed.: http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/rpbb-mopop-eng.pdf/$file/rpbb-mopop-eng.pdf

CIPO. 2011. *Practice Subsequent to the Amazon.com Decision*, PN2011-04. (1 Aug.): http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/Pratiquesuite-

PracticeSubsequent-amazon-eng.pdf/$FILE/Pratiquesuite-PracticeSubsequent-amazon-eng.pdf

CIPO. 2011. "Vision, Mission and Values." http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr00444.html

CIPO. N.d. *Moving Forward to Canada's Advantage: Strategic Plan 2007-12*. http://www.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/vwapj/corp_StrategicPlan-e.pdf/$FILE/corp_StrategicPlan-e.pdf

Canada Revenue Agency. 2009. "What is the SR&ED Program?" http://www.cra-arc.gc.ca/txcrdt/sred-rsde/bts-eng.html

Canadian International Council. 2011. *Rights and Rents: Why Canada Must Harness Its Intellectual Property Resources*. http://www.opencanada.org/wp-content/uploads/2011/10/CIC-IP-Report-2011.pdf

Canadian Radio-television and Telecommunications Commission (CRTC). 2009. *Transcript of Proceedings Before the Canadian Radio-television and Telecommunications Commission, Subject: Canadian Broadcasting in New Media*. (10 Mar.): http://www.crtc.gc.ca/eng/transcripts/2009/tb0310.html

CRTC. 2009. *Transcript of Proceedings Before the Canadian Radio-television and Telecommunications Commission, Subject: Canadian Broadcasting in New Media*. (11 Mar.): http://www.crtc.gc.ca/eng/transcripts/2009/tb0311.html

Canadian Recording Industry Association (CRIA). 2010. "Statement on Private Copying Levies." (23 Apr.): http://www.cria.ca/205.pdf

CRIA. N.d. "Statistics: December 1999." http://www.cria.ca/stats/1299_s.php

CRIA. N.d. "Statistics: December 2009." http://www.cria.ca/stats/1209_s.php

Carrier, Michael A. 2008. "Two Puzzles Resolved: Of the Schumpeter-Arrow Stalemate and Pharmaceutical Innovation Markets." *Iowa Law Review*, 93: 393-450.

Carrier, Michael. 2009. *Innovation for the 21st Century: Harnessing the Power of Intellectual Property and Antitrust Law*. New York: NY, Oxford University Press.

Carlaw, Kenneth, Les Oxley, Paul Walker, David Thorns and Michael Nuth. 2006. "Beyond the Hype: Intellectual Property and The Knowledge Society/Knowledge Economy." *Journal of Economic Surveys*, 20(4): 632-690.

Castells, Manuel. 1997. *The Information Age: Volume II - The Power of Identity*. Oxford: Blackwell.

Castells, Manuel. 2000. *The Information Age: Volume 1 - The Rise of the Network Society*. 2nd Ed. Oxford: Blackwell.

Castells, Manuel. 2000. *The Information Age: Volume III - End of Millennium*, 2nd Ed. Oxford: Blackwell.

Castells, Manuel. 2001. *The Internet Galaxy: Reflections on the Internet, Business, and Society*. Oxford: Oxford University Press.

Castells, Manuel. 2002. "The Cultures of the Internet." *Queen's Quarterly*, 109(3): 333-344.

Castells, Manuel. 2005. "The Network Society: From Knowledge to Policy." In *The Network Society: From Knowledge to Policy*. Manuel Castells and Gustavo Cardoso (Eds.), Washington, DC: John Hopkins Center for Transatlantic Relations: 3-22.

Castells, Manuel and Martin Ince. 2003. *Conversations with Manuel Castells*. Cambridge: Polity.

Center for Copyright Information. 2011. "Music, Movie, TV and Broadband Leaders Team to Curb Online Content Theft: Announce Common Framework for 'Copyright Alerts.'" (7 Jul.): http://www.copyrightinformation.org/node/704

Center for Copyright Information. N.d. "Frequently Asked Questions." http://www.copyrightinformation.org/faq

Center for Responsive Politics. 2011. "Coalition for Patent Fairness." http://www.opensecrets.org/lobby/clientsum.php?id=D000049405&year=2010

Center for Responsible Government. 2011. "Lobbying Database." http://www.opensecrets.org/lobby/index.php

Center for Responsive Politics. 2011. "Intellectual Property Owners Association." http://www.opensecrets.org/lobby/clientsum.php?id=D000026633&year=2010

Center for Responsive Politics. 2011. "Pharmaceutical Rsrch & Mfrs of American." http://www.opensecrets.org/lobby/clientsum.php?id=D000000504&year=2010

Chee, Foo Yun. 2011. "EU Commission Probes Samsung, Apple over Patents." *Reuters*, (4 Nov.): http://www.reuters.com/article/2011/11/04/us-apple-samsung-eu-idUSTRE7A32LD20111104

Chesbrough, Henry W. 2003 *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston, MA: Harvard Business School Press.

Chetty, Raj, John N. Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan. 2010. "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project Star" *NBER Working Paper No 16381*.

Chiang, Eric P. and Djesto Assane. 2007. "Determinants of Music Copyright Violations on the University Campus." *Journal of Cultural Economics*, 31: 187-204.

Chilling Effects Clearinghouse. N.d. "Chilling Effects." http://www.chillingeffects.org/index.cgi

Christie, Andrew F. 2004. "Private Copying License and Levy Schemes: Resolving the Paradox of Civilian and Common Law Approaches." In *Intellectual Property in the New Millennium*. D. Vaver and L. Bently Eds. Cambridge: Cambridge University Press: 248-258.

Chung, Emily. 2010. "Video Game Subsidy Battle Heats Up." *CBC News* (14 Sept.): http://www.cbc.ca/news/technology/story/2010/09/08/video-game-incentives-subsidies.html

Clay Mathematics Institute. 2010. "Millennium Prize Problems." http://www.claymath.org/millennium

Coalition for Patent Fairness, N.d. "CPF Statement on the Signing of the *America Invents Act*." http://www.patentfairness.org/media/press/

Coalition for Patent Fairness. N.d. "Patent Reform Supporters." http://www.patentfairness.org/learn/who/supporters/

Coase, R. H. 1960. "The Problem of Social Cost." *Journal of Law and Economics*, 3: 1-44.

Coase, R. H. 1976 "Adam Smith's View of Man." *Journal of Law and Economics*, 19: 529-546.

Cockburn, Iain M., and Rebecca Henderson. 2003. *Survey Results from The 2003 Intellectual Property Owners Association Survey on Strategic Management of Intellectual Property*: http://www.ipo.org/AM/Template.cfm?Section=Past_Meetings_and_Events&Template=/CM/ContentDisplay.cfm&ContentID=8564

Cohen, Julie E. 2007 "Creativity and Culture in Copyright Theory." *U.C. Davis Law Review*, 40: 1151-1205.

Cohen, Wesley M. 2005. "Patents and Appropriation: Concerns and Evidence," *Journal of Technology Transfer*, 30(1/2): 57-75.

Cohen, Wesley M. 2010. "Fifty Years of Empirical Studies of Innovative Activity and Performance." In *Handbook of The Economics of Innovation*. Vol. 1. Kenneth J. Arrow and Michael D. Intriligator (Eds.), Amsterdam: Elsevier: 130-213.

Cohen, Wesley M., Akira Goto, Akiya Nagata, Richard R. Nelson and John P. Walsh. 2002. "R&D Spillovers, Patents and the Incentives to Innovate in Japan and the

United States." *Research Policy*, 31: 1349-1367.

Cohen, Wesley M. and John P. Walsh. 2010. "Access – Or Not – In Academic Biomedical Research." In *Working within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Society*. Rochelle C. Dreyfuss, Harry First and Diane L. Zimmerman, (Eds.), Oxford: Oxford University Press: 3-28.

Cohen, Wesley M., Richard R. Nelson and John P. Walsh. 2000. "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (Or Not)." *NBER Working Paper*, 7552: 1-49.

Colson, Thomas J. 2001. "Defensive Publishing: Protect Your Intellectual Property." *Machine Design*, 73(6): 72-74.

Colson, Thomas J. 2001. "Leveraging the Power and Value of Intellectual Property." *Ivey Business Journal*, July/August 2001: 29-33.

Commission of the European Communities. 2005. "First Evaluation of Directive 96/9/EC on the Legal Protection of Databases." *DG Internal Market and Services Working Paper*: http://ec.europa.eu/dgs/internal_market/evaluation/evaluationdatabasesdirective.pdf

Computer Industry Almanac. N.d. "Computers in Use Forecast by Country." http://www.c-i-a.com/compuseexec.htm

Condorcet, Antoine-Nicolas de. 1955. *Sketch for a Historical Picture of the Progress of the Human Mind*. June Barraclough (Trans.,), Westport, CN: Greenwood Press.

Copyright Alliance. 2008. "Our Principles." http://www.copyrightalliance.org/content.php?id=43

Council of Canadian Academies. 2009. *Innovation and Business Strategy: Why Canada Falls Short*. http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/inno/(2009-06-11)%20innovation%20report.pdf

Creative Commons. N.d. "About." http://creativecommons.org/about

Creators' Copyright Coalition. 2011. "Creators Set Out Principles for Effective Copyright Reform." http://www.creatorscopyright.ca/op-ed/2011/06

Creutzberg, Tijs. 2001 *Canada's Innovation Underperformance: Whose Policy Problem Is It?* http://www.mowatcentre.ca/pdfs/mowatResearch/36.pdf

Dahlander, Linus and David Gann. 2008. "How Open Is Innovation?" *Creating Wealth from Knowledge: Meeting the Innovation Challenge*. John Bessant, and Tim Venables (Eds.), Cheltenham, UK: Edward Elgar: 61-79.

Dam, Kenneth W. 1994. "The Economic Underpinnings of Patent Law." *The Journal of Legal Studies*, 23(1): 247-271.

David, Paul A. 2004. "Can 'Open Science' be Protected from the Evolving Regime of IPR Protections." *Journal of Institutional and Theoretical Economics*, 160(1): 9-34.

Davidson, John. 2001. "Rethinking Private Copying in the Canadian Digital Age." LLM diss., University of Toronto.

Deci, Edward L., Richard Koestner and Richard M. Ryan. 2001. "Extrinsic Rewards and Intrinsic Motivation in Education: Reconsidered Once Again." *Review of Educational Research*, 71: 1-27.

deBeer, Jeremy F. 2006. "Locks and Levies." *Denver University Law Review*, 84: 143-180.

deBeer, Jeremy F. "The Role of Levies in Canada's Digital Music Marketplace." *Canadian Journal of Law and Technology*, 4(3): 153-168

Decker, Susan. 2011. "Abbott Wins Reversal of J&J's $1.67 Billion Patent Victory." *Bloomberg*. (23 Feb.): http://www.bloomberg.com/news/2011-02-23/j-j-s-1-67-billion-patent-ruling-against-abbott-reversed-by-appeals-court.html

Decker, Susan. 2011. "Kodak Falls as ITC Leaves Apple, RIM Claims Unresolved." *Bloomberg*. (1 Jul.): http://www.bloomberg.com/news/2011-06-30/kodak-itc-case-against-apple-rim-pushed-back-until-aug-30.html

Defensive Publications. N.d. "Frequently Asked Questions." http://docs.defensivepublications.org/defensive-pubs-faqs

de Fontenay, Alain Bourdeau, Eric Bourdeau de Fountenay, and Lorenzo Maria Pupillo. 2008. "The Economics of Peer-to-Peer." *Peer-to-Peer Video: The Economics, Policy, and Culture of Today's New Mass Medium*. Eli M. Noam and Lorenzo Maria Pupillo (Eds.,) New York: Springer: 43-91

Demsetz, Harold. 1969. "Information and Efficiency." *Journal of Law and Economics*, 12: 1-22.

Department of Finance Canada and Revenue Canada. 1996. *The Federal System of Income Tax Incentives for Scientific Research and Experimental Development: Evaluation Report*. http://www.collectionscanada.gc.ca/webarchives/20071127091048/http://www.fin.gc.ca/resdev/fedsys_e.pdf

Depoorter, Ben and Sven Vanneste. 2007. "Putting Humpty Dumpty Back Together: Experimental Evidence of Anticommons Tragedies." *George Mason Law and Economics Research Paper*, 04-53: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=592166

de Tocqueville, Alexis. 1988. *Democracy in America*. J.P. Mayer (Ed.). George Lawrence (Trans.). New York: Harper Perennial.

Dinwoodie, Graeme B. 2006. "The International Intellectual Property Law System: New Actors, New Institutions, New Sources." *Marquette Intellectual Property Law Review*, 10(2): 205-214.

Dinwoodie, Graeme. 2007. "The International Intellectual Property System: Treaties, Norms, National Courts and Private Ordering." In *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-Plus Era*. Daniel J. Gervais, (Ed.), New York: Oxford University Press, 2007: 61-114.

Directory of Open Access Journals. 2011. "Directory of Open Access Journals." http://www.doaj.org/

Downs, Jr., George W., and Lawrence B. Mohr. 1976. "Conceptual Issues in the Study of Innovation," *Administrative Science Quarterly*, 21(4): 700-714.

Drahos, Peter. 1996. *A Philosophy of Intellectual Property*. Aldreshot: Dartmouth Publishing.

Drahos, Peter and John Braithwaite. 2002. *Information Feudalism: Who Owns the Knowledge Economy*. London: Earthscan.

Du Pont. 2011. "Better Things…: 1939." http://www2.dupont.com/Heritage/en_US/1939_dupont/1939_indepth.html

Dutton, William H. 1996 "Introduction." In *Information and Communications Technologies: Visions and Realities*. William H. Dutton (Ed.), Oxford: Oxford University Press: 1-16.

Dyer-Witheford, Nick. 1999. *Cyber-Marx: Cycles and Circuits of Struggle in High-Technology Capitalism*. Urbana, IL: University of Illinois Press.

Eckersley, Peter. 2004. "Virtual Markets for Virtual Goods: The Mirror Image of Digital Copyright?" *Harvard Journal of Law and Technology,* 18(1): 85-166.

Eisenberg, Rebecca. 2000. "The Promise and Perils of Strategic Publication to Create Prior Art: A Response to Professor Parchomovsky." *Michigan Law Review*, 98(7): 2358-2370.

Eisenberg, Rebecca S. 2010. "Comment: Costs, Norms, and Inertia: Avoiding an Anticommons for Proprietary Research Tools." In *Working within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Society*. Rochelle C. Dreyfuss, Harry First and Diane L. Zimmerman, (Eds.), Oxford: Oxford University Press: 176-191.

Elkin-Koren, Niva. 2000. "The Privatization of Information Policy." *Ethics and*

Information Technology, 2: 201-209

Elkin-Koren, Niva. 2005. "What Contracts Cannot Do: The Limits of Private Ordering in Facilitating a Creative Commons." *Fordham Law Review*, 74: 375-422.

Elkin-Koren, Niva. 2011. "Tailoring Copyright to Social Production." *Theoretical Inquiries in Law*, 12: 309-346.

Engleman, Eric. "Illegal Video Streaming Elevated to Felony Under Senate Bill." *Bloomberg*. (16 Jun.): http://www.bloomberg.com/news/2011-06-16/illegal-video-streaming-elevated-to-felony-under-senate-measure.html

European Commission. 2010. "Information Society." http://ec.europa.eu/information_society/index_en.htm

European Commission – European Commissioner for Research and Innovation. 2010. *Elements for Setting-up of Headline Indicators for Innovation in Support of the Europe 2020 Strategy*: http://ec.europa.eu/commission_2010-2014/geoghegan-quinn/hlp/documents/20101006-hlp-report_en.pdf

European Patent Office (EPO), 2008. "The Economic Importance of Patents." http://www.epo.org/topics/innovation-and-economy/economic-impact.html

EPO. 2010. "Keeping the Patent System Fit for Purpose." (2 Mar. 2010): http://www.epo.org/news-issues/news/2010/20100302a.html

First, Harry. 2007. "Controlling the Intellectual Property Grab: Protect Innovation, Not Innovators." *Rutgers Law Journal*, 38: 365-398.

Fischer, William. 2001. "Theories of Intellectual Property." In *New Essays in the Legal and Political Theory of Property*. Stephen R. Munzer (Ed.). Cambridge: Cambridge University Press, 168-199.

Fisher III, William W. 2004. *Promises to Keep: Technology, Law, and the Future of Entertainment*. Stanford: Stanford University Press.

Fong, Vivian J. 2009. "Are We Making Progress?: The Constitution as a Touchstone for Creating Consistent Patent Law and Policy." *University of Pennsylvania Journal of Constitutional Law*, 11: 1163-1198.

Foreign Affairs and International Trade Canada. 2011. "Canada-European Union: Comprehensive Economic and Trade Agreement (CETA) Negotiations." http://www.international.gc.ca/trade-agreements-accords-commerciaux/agr-acc/eu-ue/can-eu.aspx?view=d

Franklin, Benjamin. 1913. *Memoirs of the Life and Writings of Benjamin Franklin*. London: J.M. Dent and Sons.

Friedman, David D. 2000. *Law's Order: What Economics Has to Do with Law and Why It Matters*. Princeton, NJ: Princeton University Press.

Friedman, Milton. 1953. *Essays in Positive Economics*. Chicago: University of Chicago Press.

Friedman, Milton and L. J. Savage. 1948. "The Utility Analysis of Choices Involving Risk." *The Journal of Political Economy*, 56(4): 279-304.

Friedman Milton and L. J. Savage. 1952. "The Expected Utility Hypothesis and the Measurability of Utility." *The Journal of Political Economy*, 60(6): 463-474.

"From Rant to Riches: Angry Student Tops the List of Most Watched YouTube Videos of 2010." 2010. *Daily Mail*. (14 Dec.): http://www.dailymail.co.uk/news/article-1338374/YouTube-watched-videos-2010-topped-angry-student-Antoine-Dobson.html

Fulton, Murray. 1997. "The Economics of Intellectual Property Rights: Discussion." *American Journal of Agricultural Economics*, 79(5): 1952-1954.

Garnham, Nicholas. 2000. "'Information Society' as Theory or Ideology: A Critical Perspective on Technology, Education and Employment in the Information Age." *Information, Communication and Society*, 3(2): 139-152.

Geist, Michael. 2008. "Everybody is Jumping on the ISP Levy Bandwagon." *Toronto Star*. (10 Mar.): http://www.thestar.com/sciencetech/article/326749

Geist, Michael. 2008. "The SAC 'Distraction.'" (28 Feb.): http://www.michaelgeist.ca/content/view/2714/125/

Geist, Michael. 2009. "Songwriters rewrite bid for legalized file sharing." *Toronto Star*, (23 Mar.): http://www.thestar.com/article/606488

Gervais, Daniel. 2007. "TRIPS and Development." In *Intellectual Property, Trade and Development: Strategies to Optimize Development in a TRIPS-Plus Era*. Daniel Gervais (Ed.). Oxford: Oxford University Press, 3-60.

Gervais, Daniel. 2009. "Of Clusters and Assumptions: Innovation as Part of a Full Trips Implementation." *Fordham Law Review*, 77: 2353-2377.

Gervais, Daniel. 2009. "(Re)implementing the Agreement on Trade-Related Aspects of Intellectual Property Rights to Foster Innovation." *The Journal of World Intellectual Property*, 12: 348-370.

Gervais, Daniel. 2009. "The Tangled Web of UGC: Making Copyright Sense of User-Generated Content." *Vanderbilt Journal of Entertainment and Technology Law*, 11(4): 841-870.

Gervais, Daniel. 2010. "User-Generated Content and Music File Sharing: A Look at Some of the More Interesting Aspects of Bill C-32." In *From Radical Extremism to Balanced Copyright: Canadian Copyright and the Digital Agend*a. Michael Geist (Ed.), Toronto: Irwin Law: 447-475.

Ghosh, Shubba. 2007. "How to Build a Commons: Is Intellectual Property Constricting, Facilitating or Irrelevant." In *Understanding Knowledge as a Commons: From Theory to Practice*. Charlotte Hess and Elinor Ostrom, Eds. Cambridge, MA: MIT Press: 209-246.

Ghosh, Shubha. 2007. "The Fable of the Commons: Exclusivity and the Construction of Intellectual Property Markets." *U.C. Davis Law Review*, 40: 850-890.

Giddens, Anthony. 1994. *Beyond Left and Right: The Future of Radical Politics*. Cambridge: Polity.

Giddens, Anthony. 1994. "Living in a Post-Traditional Society." In *Reflexive Modernization: Politics, Tradition, and Aesthetics in the Modern Social Order*. Stanford: Stanford University Press: 56-109.

Gilbert, Richard. 2006. "Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate." *Innovation Policy and the Economy*, 6: 159-215.

Gill, David. "Strategic Disclosure of Intermediate Research Results." *Journal of Economics and Management Strategy*, 17(3): 733-758.

GNU Operating System. 2011. "Licenses." http://www.gnu.org/licenses/licenses.html

GNU Operating System. 2011. "The GNU Operating System." http://www.gnu.org/

Goel, Sanjay, Paul Meising, and Uday Chandra, 2010. "The Impact of Illegal Peer-to-Peer File Sharing on the Media Industry." *California Management Review*, 52(3): 6-33.

Gonzalez-Alvarez and Mariano Nieto-Antolin, Nuria. "Appropriability of Innovation Results: An Empirical Study in Spanish Manufacturing Firms." *Technovation*, 27: 280-295.

Gordon, Wendy J. 2004. "Render Copyright unto Caesar: On Taking Incentives Seriously." *University of Chicago Law Review*, 71: 75-92.

Gordon, Wendy J. and Robert G. Bone. 2000. "Copyright." In *Encyclopedia of Law Economics*. Vol. 1. Boudewijn Bouckaert and Gerrit De Geest (Eds.). Cheltenham, UK: Edward Elgar: 189-215.

Gossen, Hermann Heinrich. 1983. *The Laws of Human Relations and the Rules of Human Action Derived Therefrom*. Rudolph C. Blitz (Trans.). Cambridge, MA: MIT Press.

Gowers, Andrew. 2005. *Gowers Review of Intellectual Property*: http://webarchive.nationalarchives.gov.uk/+/http://www.hm-treasury.gov.uk/d/pbr06_gowers_report_755.pdf

Graham, Stuart J. H., Robert P. Merges, Pam Samuelson, and Ted Sichelman. 2008. "High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey." *Berkeley Technology Law Journal*, 24: 1255-1327.

Grampp, William D. 1948. "Adam Smith and Economic Man." *Journal of Political Economy*, 56(4): 315-336.

Gratz, Joseph. 2004. "Reform in the 'Brave Kingdom': Alternative Compensation Systems for Peer-to-Peer File Sharing." *Minnesota Journal of Law, Science and Technology*, 6(1): 399-430.

Griffin, Larry J., Christopher Botsko, Ana-Maria Wahl, and Larry W. Issac. 1991. "Theoretical Generality, Case Particularity: Qualitative Comparative Analysis of Trade Union Growth and Decline," Research." In *Issues and Alternatives in Comparative Social Research*, Charles C. Ragin Ed. Leiden: E.J. Brill: 110-136.

Grokster. N.d. "Grokster." http://grokster.com/

Grossman, Sanford J. and Joseph E. Stiglitz. 1980. "On the Impossibility of Informationally Efficient Markets." *American Economic Review*, 70(3): 393-408.

Gurstein, Michael. 2011. "Open Data: Empowering the Empowered or Effective Data Use for Everyone?" *First Monday*, 16(2): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/3316/2764

Gutierrez, Carlos M. 2008. "Remarks at the Council on Competitiveness Awards Dinner, Washington D.C." (12 Nov.): http://2001-2009.commerce.gov/NewsRoom/SecretarySpeeches/PROD01_007519

Halbert, Debora. 2009. "Mass Culture and the Culture of the Masses: A Manifesto for User-Generated Rights." *Vanderbilt Journal of Entertainment and Technology Law*, 11: 921-961.

Hall, Bronwyn H. 2005. "Exploring the Patent Explosion." In *Essays in Honor of Edwin Mansfield: The Economics of R&D, Innovation, and Technological Change*. Albert N. Link and F. M. Scherer (Eds.), New York: Springer: 195-208.

Hall, Bronwyn H. 2009. "Business and Financial Method Patents, Innovation, and Policy." *NBER Working Paper*, 14868: http://www.nber.org/papers/w14868

Hall, Bronwyn, and John Van Reenen. 2000. "How Effective are Fiscal Incentives for R&D? A Review of the Evidence." *Research Policy*, 29: 449-469.

Hall, Bronwyn H., and Rosemarie Ham Ziedonis. 2001. "The Patent Paradox Revisited:

An Empirical Study of Patenting in the U.S. Semiconductor Industry, 1979-1995." *RAND Journal of Economics*, 32(1): 101-128.

Hall, Gary. 2008. *Digitize This Book: The Politics of New Media, or Why We Need Open Access Now*. Minneapolis: University of Minnesota Press.

Halliday, Josh. 2011. "European Customs to Seize PlayStation Shipments in Legal Dispute." *The Guardian*. (28 Feb.): http://www.guardian.co.uk/technology/2011/feb/28/playstation-3-lg-legal-dispute

Hansen, Stephen, Amanda Brewster, Jana Asher and Michael Kisielewski. 2006. *The Effects of Patenting in the AAAS Scientific Community*. 2nd Ed. http://sippi.aaas.org/survey/AAAS_IP_Survey_Report.pdf

Harabi, Nijab. 1995. "Appropriability of Technical Innovation: An Empirical Analysis," *Research Policy*, 24: 981-992.

Hardin, Garrett. 1968. "The Tragedy of the Commons." *Science*, 162(3589): 1243-1248.

Hargadon, Andrew B. and Yellowlees Douglas. 2001. "When Innovation Meets Institutions: Edison and the Design of the Electric Light." *Administrative Science Quarterly*, 46(3): 476-501.

Hargreaves, Ian. 2011. *Digital Opportunity: A Review of Intellectual Property and Growth*. http://www.ipo.gov.uk/ipreview-finalreport.pdf

Harhoff, Dietmar, Joachim Henkel and Eric von Hippel. 2003. "Profiting from Voluntary Information Spillovers: How Users Benefit by Freely Revealing their Innovations." *Research Policy*, 32: 1753-1769.

Harnad, Stevan and Tim Brody. 2004. "Comparing the Impact of Open Access (OA) vs. Non-OA Articles in the Same Journals." *D-Lib Magazine*, 10(6): http://www.dlib.org/dlib/june04/harnad/06harnad.html

Harris, Michael H., Stan A Hannah and Pamela C. Harris. 1998. *Into the Future: The Foundation of Library and Information Science in a Post-Industrial Era*. 2nd Ed. Greenwich, CN: Ablex.

Harvey, David. 1990. *The Condition of Post Modernity*. Cambridge, MA: Blackwell.

Harvey, David. 2004. *A Brief History of Neoliberalism*. Oxford: Oxford University Press.

Harvey, David. 2006. *Spaces of Global Capitalism*. London: Verso.

Harvey, David. 2006. *The Limits to Capital*. London: Verso.

Harvey, David. 2010. *The Enigma of Capital*. Oxford: Oxford University Press.

Hassan, Robert. 2008. *The Information Society*. Cambridge: Polity.

Heald, Paul. 1991. "Federal Intellectual Property Law and the Economics of Preemption." *Iowa Law Review*, 76: 959-1010.

Hébert, Jean. 2008. "On the Proposal to Initiate a Blanket Levy System for Internet Service Providers to Enshrine Creators' 'Rights to Remuneration:' A Report on the Socio-technical Dimensions of Digital Music Prepared of the Songwriters' Association of Canada." http://clicknoise.net/wp-content/uploads/2008/02/sac-report.pdf

Hegel, G. W. F. 1996. *The Philosophy of Right*. S.W. Doyle Trans., Amherst, NY: Prometheus Books.

Helberger, Natali and P. Bernt Hugenboltz. 2007. "No Place Like Home for Making a Copy: Private Copying in European Copyright Law and Consumer Law." *Berkeley Technology Law Journal*, 22: 1061-1098

Heller, Michael A. 1998. "The Tragedy of the Anticommons: Property in Transition for Marx to Markets." *Harvard Law Review*, 111(3): 621-688.

Heller, Michael. 2008. *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives*. New York: NY, Basic Books.

Heller, Michael A., and Rebecca S. Eisenberg. 1998. "Can Patents Deter Innovation? The Anticommons in Biomedical Research." *Science*, 280(5364): 698-701.

Henkel, Joachim and Florian Jell. 2008. "Alternative Motives to File for Patents: Defensive Publishing in the Patent System." *Paper Presented at the 3rd Annual Conference of the European Policy for Intellectual Property (EPIP) Association*, Berne, Switzerland Oct 3-4, 2008: http://www.epip.eu/conferences/epip03/papers/Jell_20080920_Henkel_Jell_DP_in_the_Patent_System.pdf

Henkel, Joachim and Stefanie Pangerl. 2008. "Defensive Publishing: An Empirical Study." *DRUID Working Papers*, 08-04: http://www3.druid.dk/wp/20080004.pdf

Hennessey, Beth A. and Teresa M. Amabile. 1998. "Reward, Intrinsic Motivation, and Creativity." *American Psychologist*, 53(6): 674-675.

Hess, Charlotte and Elinor Ostrom. 2007. "Introduction: An Overview of the Knowledge Commons." In *Understanding Knowledge as a Commons: From Theory to Practice*. Charlotte Hess and Elinor Ostrom, Eds. Cambridge, MA: MIT Press: 3-26.

Hess, Thomas , Rolf T. Wigand, Florian Mann, and Benedikt von Walter. 2007. *Open Access and Science Publishing: Results of a Study of Researchers' Acceptance and Use of Open Access Publishing*. Munich: Institute for Information Systems and New Media: http://openaccess-

study.com/Hess_Wigand_Mann_Walter_2007_Open_Access_Management_Report.pdf

Hettinger, Edward C. 1989. "Justifying Intellectual Property." *Philosophy and Public Affairs*, 18(1): 31-52.

Hobbes, Thomas. 1985. *Leviathan*. C. B. Macpherson, (Ed.), London: Penguin Books.

Hoeyer, Klaus, Mette N. Svendsen and Lene Koch. 2008. "OECD Guidelines on Open Access: Commercialization in Disguise?" *Trends in Biotechnology*, 26(9): 479-82.

Hollis, Adrian. 2007. "Incentive Mechanisms for Innovation." *IAPR Technical Paper Series*, TP-07005: http://iapr.ca/files/iapr/iapr-tp-07005_0.pdf

Horowitz, Steven. 2009. "Designing the Public Domain." *Harvard Law Review*, 112: 1489-1510.

Hughes, Alan. 2008. "Innovation Policy as Cargo Cult: Myth and Reality in Knowledge-Led Productivity Growth." In *Creating Wealth from Knowledge*. John Bessant and Tim Venables, (Eds.), Cheltenham, UK: Edward Elgar: 80-104.

Hughes, Alan and Andrea Mina. 2010. "The Impact of the Patent System on SMEs." *Centre for Business Research, University of Cambridge Working Paper*, 411: http://www.cbr.cam.ac.uk/pdf/WP411.pdf

Hughes, Justin. 2006. "Copyright and Incomplete Historiographies: Of Piracy, Propertization and Thomas Jefferson." *Southern California Law Review*, 79: 933-1084.

Hui, Kai-Lung and I. P. L. Png. 2002. "On the Supply of Creative Work: Evidence from the Movies." *American Economic Review*, 92(2): 217-220.

Hunt, Robert M. 2001. "You Can Patent That? Are Patents on Computer Programs and Business Methods Good for the New Economy?" *Business Review – Federal Reserve Bank of Philadelphia*, Q1: 5-15.

Hunt, Robert and James Bessen. 2004. "The Software Patent Experiment." *Federal Reserve Bank of Philadelphia Business Review*, Q3 2004: 22-32.

Hurt, Robert M. and Robert M. Schuchman. 1966. "The Economic Rationale of Copyright." *American Economic Review*, 56(1/2): 421-432.

IBM. 2009. "IBM Shatters U.S. Patent Record; Will Openly Publish Many More Future Inventions; IBM Research to Work on Patent Quality Index." (14 Jan.): http://www-03.ibm.com/press/us/en/pressrelease/26471.wss

IBM. 2011. "IBM Shatters U.S. Patent Record; Tops Patent List for 18th Consecutive Year." (10 Jan.): http://www-03.ibm.com/press/us/en/pressrelease/33341.wss

IBM. N.d. "IBM Redbooks." http://www.redbooks.ibm.com/

IBM. N.d. "Technical Disclosure for Patents." http://www.ibm.com/ibm/licensing/patents/disclosures.shtml

Industry Canada. 2008. "European Union – Canada Joint Statement: Electronic Commerce in the Global Information Society." http://www.ic.gc.ca/eic/site/ecic-ceac.nsf/eng/gv00386.html

Industry Canada. 2008. "Canada – United Kingdom Joint Statement on Global Electronic Commerce and E-Government." http://www.ic.gc.ca/eic/site/ecic-ceac.nsf/eng/gv00387.html

Industry Canada. 2008. "Canada – Costa Rica Joint Statement on Global Electronic Commerce." http://www.ic.gc.ca/eic/site/ecic-ceac.nsf/eng/gv00382.html

Industry Canada. 2009. "Convergence Policy – Backgrounder." http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf05267.html

Industry Canada. 2011. "Minister Paradis Reaffirms Commitment to Canada's Digital Economy." http://www.ic.gc.ca/eic/site/ic1.nsf/eng/06506.html

Ingram, John Kells. 1914. *A History of Political Economy*. 2nd Ed. London, Adam and Charles Black.

Intel. N.d. "Moore's Law and Intel Innovation." http://www.intel.com/about/companyinfo/museum/exhibits/moore.htm

Intellectual Property Owners Association. 2011. *Top 300 Organizations Granted U.S. Patents in 2010.* http://www.ipo.org/AM/Template.cfm?Section=Top_300_Patent_Owners&template=/CM/ContentDisplay.cfm&ContentID=29856

International Federation of the Phonographic Industry (IFPI). 2009. *Digital Music Report 2009: New Business Models for a Changing Environment.* http://www.ifpi.org/content/library/DMR2009-real.pdf

IFPI. 2011. *IFPI Digital Music Report 2011: Music at the Touch of a Button*. http://www.ifpi.org/content/library/DMR2011.pdf

International Intellectual Property Alliance (IIPA). N.d. "Description of the IIPA." http://www.iipa.com/aboutiipa.html

Institute of Intellectual Property. 2009. "Peer to Patent in Japan." http://www.iip.or.jp/e/e_p2pj/

IP.com. 2011. "Defensive Publishing." http://priorartdatabase.com/defensive-publishing.html

IP.com. 2011. "IP.com." http://www.ip.com

IP.com. 2011. "Journal Overview." http://priorartdatabase.com/prior-art-journal.html

IP.com. 2011. "Non-Patent Literature Coverage." http://ip.com/resources/coverage-npl.html

IP.com. 2011. "Our Clients and Affiliates." http://ip.com/about/clients.html

IP.com. 2011. "Pricing." http://priorartdatabase.com/prior-art-pricing.html

IP.com. 2011. "Search for Technical Disclosures and Non-Patent Literature." http://priorartdatabase.com/search.html#legacy

IP.com. 2011. "Searching Overview." http://priorartdatabase.com/prior-art-searching.html

ISI Web of Science. 2010. "Journal Citation Reports, 2010: Biology." *Thompson Reuters*. http://wokinfo.com/products_tools/analytical/jcr/ [Subscription required].

Jaffe, Adam B. 2000. "The U.S. Patent System in Transition: Policy Innovation and the Innovation Process." *Research Policy*, 29: 531-557.

Jaffe, Adam B. and Josh Lerner 2006. *Innovation and Its Discontents: How Our Broken Patent System Is Endangering Innovation and Progress, and What to Do About It*. Princeton, NJ: Princeton University Press.

Jaffe, Adam B. and Josh Lerner. 2006. "Innovation and Its Discontents." *Innovation Policy and the Economy*, 6: 27-65.

Jefferson, Thomas. 1813. "To Issac McPherson: Monticello, August 13, 1813." In *Jefferson: Political Writings*. Joyce Appleby and Terence Ball (Eds.), Cambridge: Cambridge University Press: 575-581.

Jevons, W. Stanley. 1965. *The Theory of Political Economy*. 5th Ed. New York: Augustus M. Kelly.

Jin, Hyunjoo and Poornima Gupta. 2011. "Apple Blocks Samsung from Selling Galaxy Tablet in EU." *The Globe and Mail*. (10 Aug.): http://www.theglobeandmail.com/news/technology/tech-news/apple-blocks-samsung-from-selling-galaxy-tablet-in-eu/article2124845/

Johnson, Justin P. 2004. "Defensive Publishing by a Leading Firm." http://ssrn.com/abstract=606781

Judge, Elizabeth F. and Daniel Gervais. 2009. "Of Silos and Constellations: Comparing Notions of Originality in Copyright Law." *Cardozo Arts and Entertainment Law Journal*, 27: 375-408.

Kahin, Brian. 2007 "Cyberinfrastructure and Innovation Policy." *First Monday*, 12(6): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1906/1788

Kahin, Brian. 2007. "Patents and Diversity in Innovation." *Michigan Telecommunications Technology Law Review*, 13: 389-399.

Kahin, Brian, and Christopher T. Hill. 2010. "United States: The Need for Continuity." *Issues in Science and Technology*, 23(3): 51-60.

Kamiyama, Shigeki, Jerry Sheehan, and Catalina Martinez. 2006. "Valuation and the Exploitation of Intellectual Property," *OECD Science, Technology and Industry Working Papers*, 2006/5: 1-48.

Kant, Immanuel. 1883. "Die Unrechtmässigkeit des Büchenachdrucks." In *Copyrights and Patents for Inventions*. Vol. 2, R. A. Macfie (Ed.), Edinburgh: T. and T. Clark: 581-586.

Kay, John. 1993. "The Economics of Intellectual Property Rights." *International Review of Law and Economics*, 13: 337-348.

Kellner, Douglas. 1989. *Critical Theory, Marxism and Modernity*. Cambridge: Polity.

Kellner, Douglas. 1990. "Critical Theory and the Crisis of Social Theory." *Sociological Perspectives*, 33(1): 11-33.

Kendall, Bridget. 2001. "The New World Order." *BBC News*. 15 Aug.: http://news.bbc.co.uk/2/hi/europe/1480801.stm

Keynes, John Neville. 1930. *The Scope and Method of Political Economy*. 4th Ed. London: Macmillan and Co.

King, Peter. 1858. *The Life and Letters of John Locke with Extracts from his Journals and Common Place Books*. New Ed., London: Bell and Daldy.

Kitch, Edmund W. 1977. "The Nature and Function of the Patent System." *Journal of Law and Economics*, 20(2): 265-29.

Kitch, Edmund W. 1986. "Patents: Monopolies or Property Rights." *Research in Law and Economics*, 8: 31-41.

Kitch, Edmund W. 2000. "Elementary and Persistent Errors in the Economic Analysis of Intellectual Property." *Vanderbilt Law Review*, 53: 1727-1741.

Klein, Jeremy A. 2001. "Innovation as Discourse." Paper presented at the annual meeting of the International Association for Management of Technology (IAMOT). Mar. 19, Lausanne, Switzerland: http://www.iamot.org/conference/index.php/ocs/7/paper/viewFile/830/280

Knight, Frank H. 1956. *On the History and Method of Economics*. Chicago: University of Chicago Press.

Kocieniewski, David. 2011. "Rich Tax Breaks Bolster Makers of Video Games." *The New York Times*, (10 Sept.): http://www.nytimes.com/2011/09/11/technology/rich-tax-breaks-bolster-video-game-makers.html?_r=1&scp=4&sq=video%20games&st=cse

Korobkin, Russell B. and Thomas S. Ulen. 1998. "Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics." *California Law Review*, 88(4): 1051-1144.

Kozinski, Alex and Christopher Newman. 1999. "What's So Fair about Fair Use?" *Journal of the Copyright Society of the U.S.A.*, 46(4): 513-530.

Kravets, David. 2008. "File Sharing Lawsuits at a Crossroads, After 5 Years of RIAA Litigation." *Wired*, (4 Sept.): http://www.wired.com/threatlevel/2008/09/proving-file-sh/

Krueger, Anne O. 1974. "The Political Economy of the Rent-Seeking Society." *American Economic Review*, 64(3): 291-303.

Ku, Raymond Shih Ray. 2002. "The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology." *University of Chicago Law Review*, 69(1): 263-324.

Ku, Raymond Shih Ray, Jiayang Sun and Yiying Fan. 2009. "Does Copyright Law Promote Creativity? An Empirical Analysis of Copyright's Bounty." *Vanderbilt Law Review*, 62: 1669-1746.

Kurtz, Michael and Tim Brody. 2006. "The Impact Loss to Authors and Research." In *Open Access: Key Strategic, Technical and Economic Aspects*. Neil Jacobs, (Ed.), Oxford: Chandos: 45-54.

L'Accès Gratuit à la Musique est un Mythe. 2010. "L'AGAMM Rights Holders Demand Their Fair Share." (15 Jun.): http://www.apem.ca/lagamm/cmq_ang_15juin10.pdf

Lakoff, George. 2008. *The Political Mind: Why You Can't Understand 21st-Century Politics with an 18th-Century Brain*. New York: Viking.

Lamberton, Donald McL. 2001."The Knowledge Based Economy: Better Living or Bigger Profits." In *Innovation, Economic Progress and the Quality of Life*. Gerry Sweeney, (Ed.), Cheltenham, UK: Edward Elgar, 111-119.

Landes, William M. and Richard A. Posner. 1988. "The Economics of Trademark Law." *The Trademark Reporter*, 78: 267-306.

Landes, William M., and Richard A. Posner. 1989. "An Economic Analysis of Copyright." *Journal of Legal Studies*, 18: 325-363.

Landes, William M. and Richard A. Posner. 2003. "Indefinitely Renewable Copyright." *University of Chicago Law Review*, 70(2): 471-518.

Landes, William M. and Richard A. Posner. 2003. *The Economic Structure of Intellectual Property Law*. Cambridge, MA: Belknap Press.

Lei, Zhen, Rakhi Juneja and Brian D. Wright. 2009. "Patents versus Patenting: Implications of Intellectual Property Protection for Biological Research." *Nature Biotechnology*, 27(1): 36-40.

Lemley, Mark A. 1997. "Romantic Authorship and the Rhetoric of Property." *Texas Law Review*, 75: 873-906.

Lemley, Mark A. 2004. "Ex Ante versus Ex Post Justifications for Intellectual Property." *University of Chicago Law Review*, 71: 129-149.

Lemley, Mark A. 2005. "Property, Intellectual Property, and Free Riding." *Texas Law Review*, 83: 1031-1075.

Lepper, Mark R., David Greene, and Richard E. Nisbett. 1973. "Undermining Children's Intrinsic Interest with Extrinsic Reward: A Test of the 'Overjustification' Hypothesis." *Journal of Personality and Social Psychology*, 28(1): 129-137.

Lerner, Josh. 2002. "Patent Protection and Innovation over 150 Years." *NBER Working Paper*, 8977: http://www.nber.org/papers/w8977

Lerner, Josh and Jean Triole, 2002. "Some Simple Economics of Open Source." *The Journal of Industrial Economics*, 50(2): 197-234.

Leslie, Thomas Edward Cliffe. 1969. *Essays in Political Economy*. 2nd Ed. New York: Augustus M Kelly.

Lessig, Lawrence. 2001. *The Future of Ideas*. New York: Random House.

Lessig, Lawrence. 2004. *Free Culture: How Big Media Uses Technology and the Law to Lock Down Culture and Control Creativity*. New York: Penguin.

Lessig, Lawrence. 2006. *Code*. Ver. 2.0. New York: Basic Books.

Levin, Richard C., Alvin K. Klevorick, Richard R. Nelson, Sidney G. Winter, Richard Gilbert, and Zvi Griliches. 1987. "Appropriating the Returns from Industrial Research and Development." *Brookings Papers on Economic Activity*, 1987(3): 783-831.

Licthman, Douglas, Scott Baker and Kate Kraus. 2000. "Strategic Disclosure in the Patent System." *Vanderbilt Law Review*, 53(6): 2175-2217.

Liebowitz, Stan J. 2004. "Alternative Copyright Systems: The Problems with a Compulsory License." *IP Central Review*, 1(2): 1-21.

Liebowtiz, Stan J. 2006. "File Sharing: Creative Destruction or Just Plain Destruction?" *Journal of Law and Economics*, 49: 1-28.

Liebowitz, Stan J. and Stephen Margolis. 2005. "Seventeen Famous Economists Weight in on Copyright: The Role of Theory, Empirics, and Network Effects." *Harvard Journal of Law and Technology*, 18(2): 435-457

Liebowitz, Stan J. and Richard Watt. 2006. "How to Best Ensure Remuneration for Creators in the Market for Music? Copyright and Its Alternatives." *Journal of Economic Surveys*, 20(4): 513-545.

Litman, Jessica. 2001. *Digital Copyright*, Amherst, NY: Prometheus Books.

Litman, Jessica. 2004. "Sharing and Stealing." *Hastings Communications and Entertainment Law Journal*, 27: 1-49.

Locke, John. 1963. *Two Treaties of Government: The Second Treaties of Government*. Rev. Ed. New York: New American Library.

London Economics. 2010. *Patent Backlogs and Mutual Recognition*. http://www.ipo.gov.uk/p-backlog-report.pdf

Lucasfilm. 2006. "Lucasfilm Ltd. Wins Major Copyright Infringement Lawsuit Against *Star Wars* Stormtrooper Pirate." http://www.lucasfilm.com/press/news/news20061011.html

Ludwig von Mises Institute. N.d. "About the Mises Institute." http://mises.org/about.aspx

Lunney, Jr., Glynn S. 1996. "Reexamining Copyright's Incentives-Access Paradigm." *Vanderbilt Law Review*, 49(3): 483-656.

Lunney, Glynn S. 2001. "The Death of Copyright: Digital Technology, Private Copying and the Digital Millennium." *Virginia Law Review*, 87(5): 813-920.

Macaulay, Thomas. 1875. Speech to the House of Commons on Copyright (5 Feb. 1841). In *The Works of Lord Macaulay (Complete)*. Vol. 8, Lady Trevelyan (Ed.). London: Longmans, Green and Co., 195-208.

Machlup, Fritz. 1958. *An Economic Review of the Patent System: A Study of the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary United States Senate*. Washington, DC: Government Printing Office.

Machlup, Fritz. 1980. *Knowledge and Knowledge Production*. Princeton, NJ: Princeton University Press.

Machlup, Fritz. 1984. *The Economics of Information and Human Capital*. Princeton, NJ: Princeton University Press.

Machlup, Fritz and Edith Penrose. 1950. "The Patent Controversy of the 19th Century." *The Journal of Economic History*, 10(1): 1-29.

Madison, James. 1961. "Number 43: Powers Delegated to the General Government III." In *The Federalist*. Benjamin Fletcher Wright (ed.), Cambridge, MA: Harvard University Press, 1961: 309-316.

Maher, Marcus. 2000. "Open Source Software: The Success of an Alternative Intellectual Property Incentive Paradigm." *Fordham Intellectual Property, Media and Entertainment Law Journal*, 10: 619-695.

Malthus, Thomas. 2008. *An Essay on the Principle of Population*. Oxford: Oxford University Press.

Mansfield, Edwin. 1986. "Patents and Innovation: An Empirical Study." *Management Science*, 32(2): 173-181.

Mansfield, Edwin, Mark Schwartz and Samuel Wagner. 1981. "Imitation Costs and Patents: An Empirical Study." *The Economic Journal*, 91(364): 907-918.

Margiano, Richard D. 2009. "Cost and Duration of Patent Litigation." *Managing Intellectual Property*, 186: 49.

Marx, Karl, and Friedrich Engels. 1985. *The Communist Manifesto*. London: Penguin.

Marx, Leo. 2003. "Does Improved Technology Mean Progress." In *Technology and the Future*, Albert H. Teich, Ed. Belmont, CA: Wadsworth/Thomson, 2003: 3-12.

Maxwell, Elliot. 2006. "Open Standards, Open Source and Open Innovation: Harnessing the Benefits of Openness." *Innovations*, 1(3): 119-176.

May, Christopher. 2000. *A Global Political Economy of Intellectual Property Rights: The New Enclosures*. London: Routledge.

May, Christopher. 2002. *The Information Society: A Skeptical View*. Cambridge: Polity.

Mazzoleni, Roberto and Richard R. Nelson. 1998. "The Benefits and Costs of Strong Patent Protection: A Contribution to the Current Debate." *Research Policy*, 27: 273-284.

McAleer, Michael and Les Oxley. 2006. "Intellectual Property and Economic Incentives." *Journal of Economic Surveys*, 20(4): 483-491.

McCann, Anthony. 2005. "Enclosure Without and Within the 'Information Commons.'" *Information and Communications Technology Law*, 14(3): 217-240.

McGowan, Matthew K., Paul Stephens, and Dexter Gruber. 2007. "An Exploration of the Ideologies of Software Intellectual Property: The Impact on Ethical Decision Making*." Journal of Business Ethics*, 73: 409-424.

McKenna, Barrie. 2011. "Canada's Innovation Window of Opportunity." *The Globe and Mail*, (19 Nov.): http://www.theglobeandmail.com/report-on-business/economy/canadas-innovation-window-of-opportunity/article2242078/

McKenna, Barrie. 2011. "Canada's Missing R&D Ecosystem." *The Globe and Mail*, (13 Nov.): http://www.theglobeandmail.com/report-on-business/commentary/barrie-mckenna/canadas-missing-rd-ecosystem/article2234944/

McKenna, Barrie. 2011. "Dubious Claims Diminish R&D Tax Credit." *CTV News*: http://www.ctv.ca/generic/generated/static/business/article1896434.html

McKenna, Barrie. 2011. "Flawed R&D Scheme Costs Taxpayers Billions." *The Globe and Mail*. (27 Apr.): http://www.theglobeandmail.com/report-on-business/flawed-rd-scheme-costs-taxpayers-billions/article1939418/

McKenna, Barrie. 2001. "Time for Action on Innovation, Not More Study." *The Globe and Mail*, (3 July): http://www.theglobeandmail.com/report-on-business/commentary/barrie-mckenna/time-for-action-on-innovation-not-more-study/article2084968/

McLeod, Kembrew. 2000. "How Copyright Law Changed Hip Hop: An Interview with Public Enemy's Chuck D and Hank Shocklee." *Stay Free*, 20: http://www.stayfreemagazine.org/archives/20/public_enemy.html

Menell, Peter S. 1987. "Tailoring Legal Protection for Computer Software." *Stanford Law Review*, 39(6): 1329-1372.

Menell, Peter S. 2000. "Intellectual Property: General Theories." in *Encyclopedia of Law Economics*. Vol. 1. Boudewijn Bouckaert and Gerrit De Geest (Eds.). Cheltenham, UK: Edward Elgar: 129-188.

Menger, Carl. 2007. *Principles of Economics*. Auburn, AB: Ludwig von Mises Institute.

Merges, Robert P. 1988. "Commercial Success and Patent Standards: Economic Perspectives on Innovation." *California Law Review*, 76: 803-876.

Merges, Robert P. 2004. "A New Dynamism in the Public Domain." *University of Chicago Law Review*, 71(1): 183-203.

Merges, Robert P. 2004. "Compulsory Licenses vs. the Three 'Golden oldies:' Property Rights Contracts and Markets, *CATO Institute Policy Analysis 508*: http://www.cato.org/pubs/pas/pa508.pdf

Merges, Robert P. 2007. "Locke Remixed ;-)." *U.C. Davis Law Review*, 40: 1259-1273.

Mezei, Peter. 2008. "Fair Use and Culture: Comments on the Gowers Review." *University of Toledo Law* Review, 39: 653-668.

Mill, John Stuart. 1844. "On the Definition of Political Economy; and on the Method of Investigation Property to It." In *Essays on Some Unsettled Questions in Political Economy*. London: John W. Parker, 129-164.

Mill, John Stuart. 1882. *A System of Logic, Ratiocinative and Inductive*. 8th Ed. New York: Harper and Bros.

Mill, John Stuart. 1948. *Essays on Some Unsettled Questions in Political Economy*. London: University of London.

Moore, Adam D. 2001. *Intellectual Property and Information Control: Philosophic Foundations and Contemporary Issues*. New Brunswick, NJ: Transaction.

Moreno, Jonathan D. 1997 "Science Progress, the Phrase and the Title." *Center for American Progress*. (4 Oct.): http://www.americanprogress.org/issues/2007/10/science_progress.html

Moreno, Jonathan D., and Rick Weiss. 2009. "Introduction: Time for Science to Reclaim Its Progressive Roots." In *Science Next: Innovation from the Common Good from the Center for American Progress*. Jonathan D. Moreno and Rick Weiss (Eds.), New York: Bellevue Literary Press:13-18.

Morrow, Raymond A. and David D. Brown. 1994. *Critical Theory and Methodology*. Thousand Oaks, CA: Sage.

Moser, Petra. 2005. "How Do Patent Laws Influence Innovation? Evidence from Nineteenth-Century World's Fairs." *American Economic Review*, 95(4): 1214-1236.

Mossoff, Adam. 2007. "Who Cares What Thomas Jefferson Thought about Patents? Reevaluating the Patent 'Privilege' in a Historical Context." *Cornell Law Review*, 92: 953-1012.

Napster. 2008. "About Napster." http://www.napster.ca/about_napster.html

National Research Council Canada. 2010. "Canada's Technology Clusters." http://www.nrc-cnrc.gc.ca/eng/clusters/index.html

National Research Council Canada. 2010. "Our Mandate." http://www.nrc-cnrc.gc.ca/eng/about/mandate.html

National Research Council Canada. 2011. "About the NRC Industrial Research Assistance Program." http://www.nrc-cnrc.gc.ca/eng/ibp/irap/about/index.html

National Small Business Association. 2011. "NSBA Cautions Lawmakers Against Patent Reform." (7 Sept.): http://www.nsba.biz/content/4180.shtml

Netanel, Neil Weinstock. 2003. "Impose a Noncommercial Use Levy to Allow Free Peer-to-Peer File Sharing." *Harvard Journal of Law and Technology*, 17(1): 1-84.

Netcraft. 2011. "June 2011 Web Server Survey." http://news.netcraft.com/archives/2011/06/07/june-2011-web-server-survey.html

Nicol, Dianne, and Jane Nielsen. 2003. "Patents and Medical Biotechnology: An Empirical Analysis of Issues Facing the Australian Industry." *Centre for Law and Genetics Occasional Paper*, 6: http://www.ipria.org/publications/reports/BiotechReportFinal.pdf

Nisbet, Robert. 1980. *History of the Idea of Progress*. New York: Basic Books.

Nordhaus, William D.1969. *Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change*. Cambridge, MA: MIT Press.

OCLC. 2011. *WorldCat*: http://www.worldcat.org/

O'Keefe, Ed. 2011. "Budget Could Close Door on Open Government." *The Washington Post*, (14 Apr.): http://www.washingtonpost.com/blogs/federal-eye/post/budget-could-close-the-door-on-open-government/2011/04/13/AFttdXbD_blog.html?wpisrc=nl_fedinsider

Oksanen, Ville and Mikko Valimaki. 2005. "Copyright Levies as an Alternative Compensation Method for Recording Artists and Technological Development." *Review of Economic Research on Copyright Issues*, 2(2): 25-39.

Oliar, Dotan. 2006. "Making Sense of the Intellectual Property Clause: Promotion of Progress as a Limitation on Congress's Intellectual Property Power." *Georgetown Law Journal*, 94: 1771-1845.

Open Source Initiative. N.d. "Licenses by Name." http://opensource.org/licenses/alphabetical

Organisation for Economic Cooperation and Development (OECD). 2002. *Genetic Inventions, Intellectual Property Rights and Licensing Practices: Evidence and Policies*. http://www.oecd.org/dataoecd/42/21/2491084.pdf

OECD. 2005. *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*.

3rd Ed. Paris: OECD.

OECD. 2007. *OECD Principles and Guidelines for Access to Research Data from Public Funding*. http://www.oecd.org/dataoecd/9/61/38500813.pdf

OECD. 2010. *Measuring Innovation: A New Perspective*. Paris: OECD.

OECD. 2010. *Ministerial Report on the OECD Innovation Strategy: Key Findings*. http://www.oecd.org/dataoecd/51/28/45326349.pdf

OECD. 2010. *OECD Information Technology Outlook*. http://dx.doi.org/10.1787/it_outlook-2010-en

OECD. 2010. *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*. Paris, OECD.

Ostergard, Robert. 2007. "Economic Growth and Intellectual Property Rights Protection: A Reassessment of the Conventional Wisdom." In *Intellectual Property, Trade and Development: Strategies to Optimize Development in a TRIPS-Plus Era*. Daniel Gervais (Ed.). Oxford: Oxford University Press, 115-156.

Owen, David S. 2002. *Between Reason and History: Habermas and the Idea of Progress*. Albany, NY: State University of New York Press.

Oxford English Dictionary. 2001. Oxford University Press: http://dictionary.oed.com

Palmer, Tom G. 1990. "Are Patents and Copyrights Morally Justified? The Philosophy of Property Rights and Ideal Objects." *Harvard Journal of Law and Public Policy*, 13: 817-865.

Parchomovsky, Gideon. 2000. "Publish or Perish." *Michigan Law Review*, 98(4): 926-951.

Parliament of Canada. N.d. "House Government Bill 41st Parliament, 1st Session: C-11" *LEGISinfo*: http://www.parl.gc.ca/LegisInfo/BillDetails.aspx?Mode=1&Language=E&billId=5134851&View=0

Patent Commons Project. N.d. "Commitments." http://www.patentcommons.org/resources/about_commitments.php

Patent Commons Project. N.d. "Find Contributors." http://www.patentcommons.org/commons/contributorsearch.php

"Patently Absurd?" 2001. *The Economist*, (23 Jun.): http://www.economist.com/node/662374

Peer Patent. N.d. "Services." http://peerpatent.org/pages/services

Peer to Patent. 2010. “Welcome to Peer to Patent.” http://peertopatent.com

Peer to Patent. N.d. “About the Project.” http://peertopatent.tumblr.com/abouttheproject

Penrose, Edith Tilton. 1951. *The Economics of the International Patent System*. Baltimore, MD: Johns Hopkins Press.

Persky, Joseph. 1995. “Retrospectives: The Ethology of Homo Economicus.” *Journal of Economic Perspectives*, 9(2): 221-231.

Phipps, Simon. 2006. “The Challenge of Open Source Software – Open up with Simon Phipps, Sun’s Chief Open Source Office.” *Sun Inner Circle Newsletter*, (Sept.): http://www.sun.com/emrkt/innercircle/newsletter/0906feature.html

Pigou, Arthur Cecil. 2009. *The Economics of Welfare*. New Brunswick, NJ: Transaction Publishers.

Pilieci, Vito. 2011. “Canadian Songwriters Propose $10 File Sharing Fee.” *National Post*, (7 Mar.): http://arts.nationalpost.com/2011/03/07/canadian-songwriters-propose-10-file-sharing-fee/

Plant, Arnold. 1934. “The Economic Aspects of Copyright in Books.” *Economica*, 1(2): 167-195.

Plant, Arnold. 1934. “The Economic Theory Concerning Patents for Inventions.” *Economica*, 1(2), (1934): 30-51.

Png, I. P. L., and Qiu-hon Wang. 2006. *Copyright Duration and the Supply of Creative Work*: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=932161

Ponce, Carlos J. 2008. “More Secrecy… More Knowledge Disclosure? On Disclosure Outside of Patents.” *European University Institute (EUI) Working Paper MWP 2008/02*: http://cadmus.eui.eu/bitstream/handle/1814/8091/EUI-MWP-2008-02.pdf?sequence=1

Polanvyi, Michael. 1944. “Patent Reform.” *The Review of Economic Studies*, 11(2): 61-76.

Pollack, Malla. 2001. “What is Congress Supposed to Promote?: Defining ‘Progress’ in Article I, Section 8, Clause 8 of the United States Constitution, or Introducing the Progress Clause.” *Nebraska Law Review*, 80:755-815.

Polushin, William. 2011. “Canada Must Change Its Innovation Ecosystem.” *The Globe and Mail*. (16 Nov): http://www.theglobeandmail.com/report-on-business/international-news/global-exchange/international-roundup/canada-must-change-its-innovation-ecosystem/article2236983/

Posner, Richard A. 1979. "Utilitarianism, Economics and Legal Theory." *Journal of Legal Studies*, 8: 103-140.

Posner, Richard A. 1991. *The Economics of Justice*. Cambridge MA: Harvard University Press.

Posner, Richard A. 1998. "Rational Choice, Behavioral Economics, and the Law," *Stanford Law Review*, 50: 1551-1575.

Posner, Richard A. 2005. "Intellectual Property: The Law and Economics Approach." *Journal of Economic Perspectives*, 19(2): 57-73.

Posner, Richard A. 2007. *Economic Analysis of Law*. 7th Ed. New York: Wolters Kluwer.

Priest, George L. 1986. "What Economists Can Tell Lawyers about Intellectual Property: Comment on Cheung." *Research in Law and Economics*, 8: 19-24.

Public Library of Science. N.d. "About PLoS Biology" http://www.plosbiology.org/static/information.action

PubMed Central. 2010. "New in PMC – PMC Hits the Two Million Mark." http://www.ncbi.nlm.nih.gov/pmc/about/new_in_pmc.html#day12

Pyati, Ajit K. 2005. "WSIS: Whose Vision of an Information Society?" *First Monday*, 10(5): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1241/1161

Pyati, Ajit. 2007. "A Critical Theory of Open Access: Libraries and Electronic Publishing." *First Monday*, 12(10): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1970/1845

Pyett, Amy and Narayanan Somasundaram. 2011. "Apple Wins Ban on Sale of Samsung Tablet in Australia." *The Globe and Mail*, (13 Oct.): http://www.theglobeandmail.com/news/technology/tech-news/apple-wins-ban-on-sale-of-samsung-tablet-in-australia/article2199797/

Qian, Yi. 2007. "Do National Patent Laws Stimulate Domestic Innovation in a Global Patenting Environment? A Cross-Country Analysis of Pharmaceutical Patent Protection, 1978-2002." *Review of Economics and Statistics*, 89(3): 436-453.

Quill, H. 1963. "John Harrison, Copley Medallist, and the £20 000 Longitude Prize." *Notes and Records of the Royal Society of London*, 18(2): 146-160.

Ragin, Charles C. 1987. *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. Berkeley, CA: University of California Press.

Ragin, Charles C. 1991. "Introduction: The Problem of Balancing Discourse on Cases and Variables in Comparative Social Science." In *Issues and Alternatives in*

Comparative Social Research. Charles C. Ragin (Ed.), Leiden: E.J. Brill: 1-8.

Ragin, Charles C. 1992. "'Casing' and the Process of Social Inquiry." *What Is a Case? Exploring the Foundations of Social Inquiry*. Charles C. Ragin and Howard S. Becker, (Eds.), New York, NY: Cambridge University Press: 217-226.

Rantanen, Jason. 2011. "The Effects of the *America Invents Act* on Technical Disclosure." *PatentlyO Blog*. (8 Sept.): http://www.patentlyo.com/patent/2011/09/the-effects-of-the-america-invents-act-on-technological-disclosure.html

Rdio. 2010. "Rdio Takes the Wraps of Social Music Service." http://www.rdio.com/#/press/20100803_Launch/

Recording Industry Association of America (RIAA). 2011. "For Students Doing Reports." http://www.riaa.com/faq.php

RIAA. 2011. "Why We Do What We Do." http://www.riaa.com/physicalpiracy.php?content_selector=piracy-online-why-we-do-what-we-do

RIAA. N.d. "Piracy: Online and on the Street." http://www.riaa.com/physicalpiracy.php

Reichman, Jerome and Rochelle Cooper Dreyfuss. 2007. "Harmonization without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty." In *Intellectual Property, Trade and Development: Strategies to Optimize Economic Development in a TRIPS-plus Era*. Daniel J. Gervais (Ed.), Oxford: Oxford University Press: 443-474.

"Relative Ranking of a Selected Pool of Leading Scholars in the Social Sciences by Number of Citations in the Social Science Citation Index, 2000-2009." N.d. http://www.manuelcastells.info/en/SSCIsocialranking_eng.pdf

Research Disclosure. 2011. "About the Database." http://researchdisclosure.com/searching-disclosures/about-the-database

Research Disclosure. 2011. "Publication Rates." http://www.researchdisclosure.com/publishing-disclosures/publication-rates

Research Disclosure. 2011. "Recent Disclosures." http://researchdisclosure.com/searching-disclosures/recent-disclosures

Research Disclosure. 2011. "Research Disclosure." http://www.researchdisclosure.com/

Research Disclosure. 2011. "Subscription Rates." http://www.researchdisclosure.com/searching-disclosures/subscription-rates

Research Disclosure. N.d. *An Overview of the Research Disclosure Publication Process*.

http://www.researchdisclosure.com/pdf-download/Research-Disclosure-Publication-Service.pdf

Research in Motion. 2006. "Research in Motion and NTP Sign Definitive Settlement Agreement to End Litigation." 3 Mar. 2006: http://press.rim.com/release.jsp?id=981

RIM. 2010. *Annual Report [Financial Year] 2010*. http://www.rim.com/investors/documents/pdf/annual/2010rim_ar.pdf

Reuters, "Samsung Considers Legal Action over Apple's New iPhone: Source," (20 Sept.): http://www.reuters.com/article/2011/09/20/us-samsung-apple-idUSTRE78I6NL20110920

Reuters. 2011. "Samsung Galaxy Tablet Ban Lifted in Most of Europe." *The Globe and Mail*, (16 Aug.): http://www.theglobeandmail.com/news/technology/tech-news/samsung-galaxy-tablet-ban-lifted-in-most-of-europe/article2131251/

Reuters. 2011. "Samsung to Reveal New Android 'Ice Cream Sandwich' Smartphone Oct. 19." *The Globe and Mail*, (14 Oct.): http://www.theglobeandmail.com/news/technology/tech-news/samsung-to-reveal-new-android-ice-cream-sandwich-smartphone-oct-19/article2201042/

Rich, Giles S. 1960. "Principles of Patentability." *George Washington Law Review*, 28(2): 393-407.

Rockett, Katharine. 2010. "Property Rights and Invention." In *Handbook of The Economics of Innovation*. Vol. 1. Kenneth J. Arrow and Michael D. Intriligator (Eds.), Amsterdam: Elsevier: 315-380.

Rogers, Everett M. 2003. *Diffusion of Innovations*. 5th Ed. New York: Free Press.

Romer, Paul M. 1990. "Endogenous Technological Change." *Journal of Political Economy*, 98(5 pt. 2): S71-S102.

Romer, Paul. 2002. "When Should We Use Intellectual Property Rights." *American Economic Review*, 92(2): 213-216.

Roszak, Theodore. 1996. *The Cult of Information*, 2nd Ed. Berkeley, CA: University of California Press.

Saint-Amour, Paul K. 2003. *The Copywrights: Intellectual Property and the Literary Imagination*. Ithica, NY: Cornell University Press.

"Samsung Cites Stanley Kubrick's '2001: A Space Odyssey' Movie as Prior Art Against iPad Design Patent." 2011. *FOSS Patents.* (23 Aug.): http://fosspatents.blogspot.com/2011/08/samsung-cites-stanley-kubricks-2001.html

"Samsung Redesigns Galaxy Tab after Apple's Sales Ban." 2011. *BBC News*, (17 Nov.): http://www.bbc.co.uk/news/technology-15773944

Samuelson, Pamela. 1996. "The U.S. Digital Agenda at WIPO." *Virginia Journal of International Law*, 37: 369-440.

Scherer, F. M. 1999. *New Perspectives on Economic Growth and Technological Innovation*, Washington, DC: Brookings Institute.

Schiller, Dan. 1997. "The Information Commodity: A Preliminary View." In *Cutting Edge: Technology, Information Capitalism and Social Revolution*. Jim Davis, Thomas A. Hirschl and Michael Stack (Eds.), London: Verso: 103-120.

Schiller, Dan. 2007. *How to Think about Information*. Urbana, IL: University of Illinois Press.

Schumpeter, Joseph. 1934. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*. Redvers Opie (Trans.). Cambridge, MA: Harvard University Press.

Schumpeter, Joseph. 1954. *History of Economic Analysis*. Elizabeth Boody Schumpeter (Ed.). New York: Oxford University Press.

Schumpeter, Joseph A. 1964. *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*. New York: McGraw Hill.

Schumpeter, Joseph, A. 2008. *Capitalism, Socialism and Democracy*. 3rd Ed. New York: Harper Perennial.

Schwartz, Eddie. 2010. "Legalize File Sharing." *The Mark*. (15 Apr.): http://www.themarknews.com/articles/1305-legalize-file-sharing

Schwartzman, David. 1976. *Innovation in the Pharmaceutical Industry*. Baltimore, MD: Johns Hopkins University Press.

Schweik, Charles M. and Andrei Semenov. 2006. "The Institutional Design of Open Source Programming: Implications for Addressing Complex Public Policy and Management Problems." *First Monday*, 8(1): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1019/2426

Schweik, Charles M. and Robert English. 2007. "Tragedy of the FOSS Commons? Investigating the Institutional Designs of Free/Libre and Open Source Software." *First Monday*, 12(2): http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/1619/1534

Scotchmer, Suzanne. 2004. *Innovation and Incentives*. Cambridge, MA: MIT Press.

Shapiro, Carl. 2000. "Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting." *Innovation Policy and the Economy*, 1: 119-150.

Shapiro, Carl. 2010. "Injunctions, Hold-Up, and Patent Royalties." *American Law and Economics Review*, 12(2): 280-318.

Shavell, Steven and Tanguy Van Ypesele. 2001. "Rewards versus Intellectual Property Rights." *Journal of Law and Economics*, 44: 525-547.

Sheridan, Cormac. 2005. "EPO Neem Patent Revocation Revives Biopiracy Debate." *Nature Biotechnology*, 23: 511-12.

Shiffrin, Seana Valentine. 2001. "Lockean Arguments for Private Intellectual Property." In *New Essays in the Legal and Political Theory of Property*. Stephen R. Munzer (Ed.). Cambridge: Cambridge University Press, 138-167.

Shiffrin, Seana Valentine. 2008. "The Incentives Argument for Intellectual Property Protection." In *Intellectual Property and Theories of Justice*. Axel Gosseries, Alain Marciano and Alain Stowel Eds., Houndmills, UK: Palgrave Macmillan, 2008: 94-105.

Shiva, Vandana. 2002. *Protect or Plunder*. London, Zed Books.

Siwek, Stephen E. 2009. *Copyright Industries in the U.S. Economy: The 2003-2007 Report*. Prepared for the International Intellectual Property Association (IIPA): http://www.iipa.com/pdf/IIPASiwekReport2003-07.pdf

Slacker Radio. 2011. "Subscriptions." https://store.slacker.com/store/Subscriptions.do?source=site-header

Sjoberg, Gideon, Norma Williams, Ted R. Vaughan, and Andree F. Sjoberg, 1991."The Case Study Approach in Social Research." *A Case for the Case Study*. Joe R. Feagin, Anthony M. Orum and Gideon Sjoberg, Eds. Chapel Hill, NC: University of North Carolina Press: 27-79.

Slind-Flor, Victoria. 2011. "Samsung, USPTO, Kraft, Ambercrombie: Intellectual Property." *Businessweek*, (18 Nov.): http://www.businessweek.com/news/2011-11-18/samsung-uspto-kraft-abercrombie-intellectual-property.html

Smith, Adam. 2003. *An Inquiry into the Nature and Cause of the Wealth of Nations*. New York: Bantam Classics.

Smith, Adam. 2009. *The Theory of Moral Sentiments*. New York: Penguin Books.

Songwriters Association of Canada (SAC). 2010. "Creators' Copyright Coalition Proposes Reforms to Bill C-32." http://www.songwriters.ca/news/258/20101206cccreformproposals.aspx

SAC. 2011. "Our Proposal: Detailed." http://songwriters.ca/ContentFiles/ContentPages/Documents/S.A.C.%20Proposal/S.A.C.%20Proposal%201%2015%202011.Final.pdf

SAC. N.d. "Are You an ISP, Consumer or Creative?" http://www.songwriters.ca/ispconsumercreative.aspx

SAC. N.d. "Proposal FAQ." http://www.songwriters.ca/proposalfaq.aspx

SAC. N.d. "Songwriters' Perspectives." http://songwriters.ca/songwritersperspectives.aspx

Solow, Robert M. 1957. "Technological Change and the Aggregate Production Function." *The Review of Economics and Statistics*, 39(3): 312-320.

Solow, Robert M. 1994. "Perspectives on Growth Theory." *The Journal of Economic Perspectives*, 8(1): 45-54.

Sookman, Barry. 2008. "The SAC Proposal for the Monetization of the File Sharing of Music in Canada: Does It Comply with Canada's International Treaty Obligations Related to Copyright." *Osgoode Hall Review of Law and Policy*, 1(2): 101-136.

Soulseek. N.d. "Soulseek." http://www.slsknet.org/

Stalder, Felix. 2006. *Manuel Castells: The Theory of the Network Society*. Cambridge: Polity.

Stallman, Richard. 1999. "The GNU Operating System and the Free Software Movement." In *Open Sources: Voices from the Open Source Revolution*. http://oreilly.com/catalog/opensources/book/stallman.html

Stallman, Richard. 2010. "Why Open Source Misses the Point of Free Software." *GNU Project*. http://www.gnu.org/philosophy/open-source-misses-the-point.html

Strandburg, Katherine J. 2009. "Evolving Innovation Paradigms and the Global Intellectual Property Regime." *Connecticut Law Review*, 41(3): 861-920.

Strandburg, Katherine J. 2009. "User Innovator Community Norms: At the Boundary between Academic and Industry Research." *Fordham Law Review*, 77: 2237-2274.

Stewart, Steven and David J. Bjornstad. 2002. "An Experimental Investigation of Predictions and Symmetries in the Tragedies of the Commons and Anticommons." *Joint Institute for Energy and the Environment Report*, 2002-07: http://isse.utk.edu/pdf/jieepubs/2002_07Experiment.pdf

Stevenson, Jane and Bilal Kaafarani. 2011. *Breaking Away: How Great Leaders Create Innovation that Drives Sustainable Growth – And Why Others Fail*. New York:

McGraw Hill.

Stiglitz, Joseph E. 2004. "Information and the Change in the Paradigm of Economics." *American Economist*, 48(1): 17-49.

Stiglitz, Joseph. 2008. "Economic Foundations of Intellectual Property Rights." *Duke Law Journal*, 57: 1693-1724.

Stratford Institute for Digital Media. 2011. *The Stratford Report 2011*. http://www.canada30.com/TheStratfordReport.pdf

Strong, William S. 1986. "Notes from the Carrot Patch: Copyright Incentives and Disincentives for Intellectual Innovation." *Book Research Quarterly*, 2(2): 33-39.

Suber, Peter. 2006. "Open Access in the USA." *Open Access: Key Strategic, Technical and Economic Aspects*. Neil Jacobs, (Ed.), Oxford: Chandos: 149-160.

Suber, Peter. 2007. "Creating an Intellectual Commons through Open Access." In *Understanding Knowledge as a Commons: From Theory to Practice*. Charlotte Hess and Elinor Ostrom, (Eds.), Cambridge, MA: MIT Press: 171-208.

Suber, Peter. 2010. "Open Access in 2009." *SPARC Open Access Newsletter*, 141, (2 Jan.): http://www.earlham.edu/~peters/fos/newsletter/01-02-10.htm

Swann, G. M. Peter. 2009. *The Economics of Innovation: An Introduction*. Cheltenham, UK: Edward Elgar.

Sweeney, Gerry. 2001. "Introduction: Innovation and Innovation Policy: The Need for Re-examination." In *Innovation, Economic Progress and the Quality of Life*. Gerry Sweeney, (Ed.) Cheltenham, UK: Edward Elgar: 1-19.

Szostak, Rick. 1995. *Technological Innovation and the Great Depression*. Boulder, CO: Westview Press.

Takano, Toru. 2002. "Study on Patent and Economy." *Institute of Intellectual Property Bulletin 2002*: 120-133: http://www.iip.or.jp/e/e_summary/pdf/detail2001/e13_11.pdf

Taussig, F. W. 1915. *Inventors and Money Makers*. New York: Macmillon.

Taylor, C.T. and Z. A. Silberston. 1973. *The Economic Impact of the Patent System*. Cambridge: Cambridge University Press.

Thompson, Robert. 2008. "Canada's Labels Slam Proposed Digital 'Tax.'" *Reuters*, (4 Jan.): http://www.reuters.com/article/2008/01/05/us-canada-idUSN0432940320080105

Thurow, Lester C. 1997. "Needed: A New System of Intellectual Property Rights," *Harvard Business Review*, Sept.-Oct. 1997: 94-103.

Toffler, Alvin. 1980. *The Third Wave*. New York: William Morrow.

Towse, Ruth. 2006. "Copyright and Artists: A View from Cultural Economics," *Journal of Economic Surveys*, 20(4): 567-585.

Towse, Ruth. 2006. "Copyright and Creativity: An Application of Cultural Economics." *Review of Economic Research on Copyright Issues*, 3(2): 83-91.

Trosow, Samuel E. 2002. "Information for Society: Towards a Critical Theory of Intellectual Property Policy." PhD diss., UCLA.

Trosow, Samuel E. 2003. "The Illusive Search for Justificatory Theories: Copyright, Commodification and Capital." *The Canadian Journal of Law and Jurisprudence*, 16(2): 217-241.

Trosow, Samuel E. 2003. "The Ownership and Commodification of Legal Knowledge: Using Social Theory of the Information Age as Tool for Policy Analysis." *Manitoba Law Journal*, 30: 417-462.

Trosow, Samuel E., Jacquelyn Burkell, Nick Dyer-Witheford, Pamela McKenzie, Michael B. McNally, Caroline Whippey, and Lola Wong. 2010. *Mobilizing User-Generated Content for Canada's Digital Advantage*: http://ir.lib.uwo.ca/fimspub/21/

Tushnet, Rebecca. 2009. "Economies of Desire: Fair Use and Marketplace Assumptions," *William and Mary Law Review*, 51: 513-546.

Ulmer-Eilfort, Constanze. 2003. "Private Copying and Levis for Information – and Communication-Technologies and Storage Media in Europe." *Lecture Notes in Computer Science*, 2770: 447-461.

United Kingdom – Intellectual Property Office. 2011. "Peer to Patent UK." http://www.ipo.gov.uk/peertopatent.htm

United Nations Educational, Scientific and Cultural Organization (UNESCO). 2011. "Open Access to Information." http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-access-to-scientific-information/

United States - America.gov. 2003. "U.S. Delegation Cites Consensus on Key Information Society Issues." http://www.america.gov/st/washfile-english/2003/December/20031210163112rellufj0.6401483.html

United States - Centers for Disease Control. 2011. *Policy Impact: Prescription Painkiller Overdoses*. http://www.cdc.gov/homeandrecreationalsafety/pdf/PolicyImpact-PrescriptionPainkillerOD.pdf

United States – Copyright Office. 2009. *Circular 92: Copyright Law of the United States and Related Laws Contained in Title 17 of the United States Code*. http://www.copyright.gov/title17/circ92.pdf

United States - Copyright Office. N.d. "Public Catalog." http://cocatalog.loc.gov/cgi-bin/Pwebrecon.cgi?DB=local&PAGE=First

United States Courts – 9th Circuit. 2011. "Chief Judge Alex Kozinski." http://www.ce9.uscourts.gov/chief_judge_bio.html

United States – Data.gov. N.d. "About." http://www.data.gov/about

United States – Department of Commerce – Advisory Committee on Measuring Innovation in the 21st Century Economy. 2008. *Innovation Measurement: Tracking the State of Innovation in the American Economy*. http://www.innovationmetrics.gov/Innovation%20Measurement%2001-08.pdf

United States – Department of Commerce – Information Infrastructure Task Force. 1993. *The National Information Infrastructure: Agenda for Action*. http://www.eric.ed.gov/PDFS/ED364215.pdf

United States – Department of Energy - L Prize. 2010. "Transforming the Lighting Landscape." http://www.lightingprize.org

United States – Department of Health, Education and Welfare – Commission on New Technological Uses of Copyrighted Works (CONTU). 1978. *Final Report*. http://www.eric.ed.gov/PDFS/ED160122.pdf

United States – Department of Labor – Bureau of Labor Statistics. 2010. "May 2009 National Occupational Employment Wage Estimates." http://www.bls.gov/oes/current/oes_nat.htm#25-0000

United States – Executive Office of the President – National Economic Council. 2009. *A Strategy for American Innovation: Driving Towards Sustainable Growth and Quality Jobs*. http://www.manufacturing.gov/interagency/documents/SEPT_20__Innovation_Whitepaper_FINAL.pdf

United States – Federal Trade Commission (FTC). 2003. *To Promote Innovation: The Proper Balance of Competition and Patent Law Policy*. http://www.ftc.gov/os/2003/10/innovationrpt.pdf

United States General Accounting Office (GAO). 1987. *Strengthening Worldwide Protection of Intellectual Property Rights*. http://archive.gao.gov/d2t4/132699.pdf

United States GAO. 2010. *Intellectual Property: Observations on Efforts to Quantify the Economic Effects of Counterfeit and Pirated Goods*. http://www.gao.gov/new.items/d10423.pdf

United States – General Services Administration. N.d. "Challenge.gov - Frequently Asked Questions." http://challenge.gov/faq

United States International Trade Commission (USITC). 2010. *Year in Review: Fiscal Year 2010*. http://usitc.gov/publications/year_in_review/pub4212.pdf

USITC. 2011. "Investigations under Section 337 of the *Tariff Act of 1930*: Current Statistics." http://www.usitc.gov/press_room/337_stats.htm

USITC. N.d. "Number of Section 337 Investigations Instituted by Calendar Year." http://www.usitc.gov/intellectual_property/documents/cy_337_institutions.pdf

USITC. N.d. "Pending 337 Investigations." http://info.usitc.gov/ouii/public/337inv.nsf/Pending?OpenView

United States – Library of Congress. N.d. "Bill Summary and Status 109th Congress (2005-2006) S 2695: All Information." http://thomas.loc.gov/cgi-bin/bdquery/z?d109:SN02695:@@@L&summ2=m&

United States – Library of Congress. N.d. "Bill Summary and Status 110th Congress, (2007-2008) H.R. 6845: All Information." http://thomas.loc.gov/cgi-bin/bdquery/z?d110:H.R.6845:

United States – Library of Congress. N.d. "Bill Summary and Status 111th Congress, (2009-2010) H.R. 801: All Information." http://thomas.loc.gov/cgi-bin/bdquery/z?d111:H.R.801:

United States – Library of Congress. N.d. "Bill Summary and Status 111th Congress (2009-2010) H.R. 5037: All Information." http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR05037:@@@L&summ2=m&

United States – Library of Congress. N.d. "Bill Summary and Status 111th Congress (2009-2010) H.R. 5253: All Information." http://thomas.loc.gov/cgi-bin/bdquery/z?d111:HR05253:@@@L&summ2=m&

United States – Library of Congress. N.d. "Bill Summary and Status 111th Congress (2009-2010) S. 1373: All Information." http://thomas.loc.gov/cgi-bin/bdquery/z?d111:SN01373:@@@L&summ2=m&

United States – National Economic Council. 2011. *A Strategy for American Innovation: Securing Our Economic Growth and Prosperity*: http://www.whitehouse.gov/sites/default/files/uploads/InnovationStrategy.pdf

United States – National Institutes of Health (NIH). 2005. "Policy on Enhancing Access to Archived Publications Resulting from NIH-Funded Research." http://grants.nih.gov/grants/guide/notice-files/NOT-OD-05-022.html

United States – NIH. 2011. "NIH Fiscal Policy for Grant Awards – FY 2011." http://grants.nih.gov/grants/guide/notice-files/NOT-OD-11-068.html

United States National Intellectual Property Law Enforcement Coordination Council (NIPLECC). 2008. *Report to the President and Congress on the Coordination of Intellectual Property Enforcement and Protection*. http://2001-2009.commerce.gov/s/groups/public/@doc/@os/@opa/documents/content/prod01_005189.pdf

United States Patent and Trademark Office (USPTO). 2003. *The 21st Century Strategic Plan*.: http://www.uspto.gov/web/offices/com/strat21/stratplan_03feb2003.pdf

USPTO. 2006. "Bush Administration Officials Update Congress on Intellectual Property Enforcement Efforts." http://www.uspto.gov/news/pr/2007/07-26-06ip.jsp

USPTO. 2009. "Issue Years and Patent Numbers." http://www.uspto.gov/patents/process/search/issuyear.jsp

USPTO. 2010. *2010-2015 Strategic Plan.* http://www.uspto.gov/about/stratplan/USPTO_2010-2015_Strategic_Plan.pdf

USPTO. 2010. *Manual of Patent Examining Procedure*. 8th Ed.: http://www.uspto.gov/web/offices/pac/mpep/index.htm

USPTO. 2010. "Office of Intellectual Property Policy and Enforcement: NIPLECC – National IP Law Enforcement Coordination Council – Introduction." http://www.uspto.gov/ip/global/enforcement/niplecc.jsp

USPTO. 2010. "USPTO Opens Application Exchange Program to All Applicants to Reduce Patent Backlog." http://www.uspto.gov/news/pr/2010/10_17.jsp

USPTO. 2011. "About USPTO." http://www.uspto.gov/about/index.jsp

USPTO. 2011. "Fee Schedule: Effective Sept. 26, 2011." http://www.uspto.gov/web/offices/ac/qs/ope/fee092611.htm

USPTO. 2011. "Patents Dashboard." (July): http://www.uspto.gov/dashboards/patents/main.dashxml

USPTO. 2011. "USPTO Patent Full-Text and Image Database." (20 Sept.): http://patft.uspto.gov/netahtml/PTO/search-bool.html

USPTO. 2011. "U.S. Patent Activity: Calendar Years 1790 to the Present." http://www.uspto.gov/web/offices/ac/ido/oeip/taf/h_counts.htm

USPTO. 2011. "U.S. Patent Statistics Chart Calendar Years 1963-2010." http://www.uspto.gov/web/offices/ac/ido/oeip/taf/us_stat.htm

USPTO. 2011. "Patent UPR Application Backlog." http://www.uspto.gov/dashboards/patents/kpis/kpiBacklogDrilldown.kpixml

USPTO. 2011. *Statutory Invention Registrations and Defensive Publications January 1977 to December 2010*. http://www.uspto.gov/web/offices/ac/ido/oeip/taf/sir.pdf

USPTO. 2011. "Withdrawn Patent Numbers, 1790 through 13 September 2011." http://www.uspto.gov/patents/process/search/withdrawn.jsp

USPTO. N.d. "Geographical Indications – Frequently Asked Questions." http://www.uspto.gov/ip/global/geographical/faq/index.jsp

United States Trade Representative (USTR). 2009. *2009 Special 301 Report.* http://www.ustr.gov/sites/default/files/Full%20Version%20of%20the%202009%20SPECIAL%20301%20REPORT.pdf

USTR. N.d. "Anti-Counterfeiting Trade Agreement." http://www.ustr.gov/acta

USTR. N.d. "Free Trade Agreements:" http://www.ustr.gov/trade-agreements/free-trade-agreements

USTR. N.d. "Outlines of the Trans-Pacific Partnership Agreement." http://www.ustr.gov/about-us/press-office/fact-sheets/2011/november/outlines-trans-pacific-partnership-agreement

USTR. N.d. "Trade and Investment Framework Agreements." http://www.ustr.gov/trade-agreements/trade-investment-framework-agreements

United States – White House. 2004. *A New Generation of American Innovation*. http://georgewbush-whitehouse.archives.gov/infocus/technology/economic_policy200404/toc.html

United States – White House – Office of the Press Secretary. 2011. "President Obama Signs *America Invents Act*, Overhauling the Patent System to Stimulate Economic Growth, and Announces New Steps to Help Entrepreneurs Create Jobs." (16 Sept.): http://www.whitehouse.gov/the-press-office/2011/09/16/president-obama-signs-america-invents-act-overhauling-patent-system-stim

University of Chicago Law School. 2011. "Frank H. Easterbrook: Curriculum Vitae." http://www.law.uchicago.edu/node/514/cv

University of Chicago Law School. 2011. "Richard A Posner: Curriculum Vitae." http://www.law.uchicago.edu/node/79/cv

University of Hertfordshire. 2008. *Music Experience and Behaviour in Young People: Main Findings and Conclusions*. http://songwriters.ca/ContentFiles/ContentPages/Documents/S.A.C.%20Proposal/Hertfordshire%20University%20Study%202008.pdf

University of Nottingham. 2009. "Research Funders' Open Access Policies." http://www.sherpa.ac.uk/juliet/index.php

Valkonen, Sami J., and Lawrence J. White. 2007. "An Economic Model for the Incentive/Access Paradigm of Copyright Propertization: An Argument in Support of the *Orphan Works Act*." *Hastings Communication and Entertainment Law Journal*, 29: 359-400.

Van Paassen, Kevin. 2011. "Canada Must Change Its Innovation Ecosystem," *The Globe and Mail*, (16 Nov.): http://www.theglobeandmail.com/report-on-business/international-news/global-exchange/international-roundup/canada-must-change-its-innovation-ecosystem/article2236983/

Varian, Hal R. 2005. "Copying and Copyright." *Journal of Economic Perspectives*, 19(2): 121-138.

Vaughan, Diane. 1992. "Theory Elaboration: The Heuristics of Case Analysis." In *What Is a Case? Exploring the Foundations of Social Inquiry*. Charles C. Ragin and Howard S. Becker, Eds. New York, NY: Cambridge University Press: 173-202.

Vaver, David. 1991. "Some Agnostic Observations on Intellectual Property." *Intellectual Property Journal*, 6: 121-153.

Vaver, David. 2011. *Intellectual Property Law: Copyrights, Patents and Trade-marks*. 2nd Ed. Toronto: Irwin Law.

Velben, Thorstein. 1994. *The Theory of The Leisure Class*. New York: Dover.

von Hippel, Eric. 2005. *Democratizing Innovation.* Cambridge, MA: MIT Press.

von Hippel, Eric and Georg von Krogh. 2003. "Open Source Software and the 'Private-Collective' Innovation Model: Issues for Organization Science." *Organization Science*, 14(2): 209-223

Walker, Kent. 2011. "Patents and Innovation." *The Official Google Blog*. (4 Apr.): http://googleblog.blogspot.com/2011/04/patents-and-innovation.html

Walras, Leon. 1954. *Elements of Pure Economics or The Theory of Social Wealth*. William Jaffe (Trans.). Homewood, IL: Richard D. Irwin.

Walsh, John P., Ashish Arora, and Wesley M. Cohen. 2003. "Effects of Research Tool Patents and Licensing on Biomedical Innovation." In *Patents in the Knowledge Economy*. Wesley M. Cohen and Stephen A. Merill Eds., Washington: National Academies Press, 2003: 285-340.

Walsh, John P., Charlene Cho and Wesley M. Cohen. 2003. "View from the Bench: Patents and Material Transfers." *Science*, 309(5743): 2002-03.

Walsh, John P., and Hsin-I Huang. 2007. *Research Tool Access in the Age of the IP Society: Results from a Survey of Japanese Scientists*. http://sippi.aaas.org/Pubs/SIPPI_Japan_IP_Survey.pdf

Walterscheid, Edward C. 1994. "To Promote the Progress of Science and the Useful Arts: The Background and Origin of the Intellectual Property Clause of the United States Constitution." *Journal of Intellectual Property Law*, 2(1): 1-56.

Walterscheid, Edward C. 2002. "To Promote the Progress of Science and the Useful Arts: The Anatomy of a Congressional Power." *IDEA – The Journal of Law and Technology*, 43(1): 1-81.

Walton, John. 1992. "Making the Theoretical Case." *What Is a Case? Exploring the Foundations of Social Inquiry*. Charles C. Ragin and Howard S. Becker, Eds. New York, NY: Cambridge University Press: 121-138.

Wagner, R. Polk. 2003. "Information Wants to Be Free: Intellectual Property and the Mythology of Control." *Columbia Law Review*, 103: 995-1034.

Watch Tower Bible and Track Society of Pennsylvania. 2011. "Publications Available." http://www.watchtower.org/e/publications/index.htm

Waters, Richard. 2011. "Patent Hunting is the Latest Game on the Tech Bubble Circuit." *The Globe and Mail*. (27 Jul.): http://www.theglobeandmail.com/globe-investor/patent-hunting-is-latest-game-on-tech-bubble-circuit/article2111870/

Weber, Max. 2003. *The Protestant Ethic and the Spirit of Capitalism*. Talcott Parsons (Trans.), Mineola, NY: Dover.

Webster, Frank. 2006. *Theories of the Information Society*, 3d Ed., London: Routledge.

Weiser, Philip J. 2003. "The Internet, Innovation, and Intellectual Property Policy." *Columbia Law Review*, 103: 534-613.

Willinsky, John. 2006. *The Access Principle: The Case for Open Access to Research and Scholarship*. Cambridge, MA: MIT Press.

Wiseman, Jonathan. 2012. "In Fight Over Piracy Bill, New Economy Rises Against Old." *The New York Times*. (18 Jan.): http://www.nytimes.com/2012/01/19/technology/web-protests-piracy-bill-and-2-key-senators-change-course.html?pagewanted=all

World Bank. 2011. "GDP (Current US$)." http://data.worldbank.org/indicator/NY.GDP.MKTP.CD

World Health Organization (WHO). 2006. *Public Health: Innovation and Intellectual Property Rights*. http://www.who.int/intellectualproperty/documents/thereport/CIPIH23032006.pdf

World Intellectual Property Organization (WIPO). 2010. "World Intellectual Property Day 2010 – Innovation Linking the World." http://www.wipo.int/pressroom/en/articles/2010/article_0010.html

WIPO. 2010. *Handbook on Industrial Property Information Documentation: Part 4 PCT Minimum Documentation*. http://www.wipo.int/standards/en/pdf/04-02-01.pdf

WIPO. N.d. "About Geographical Indication." http://www.wipo.int/geo_indications/en/about.html

WIPO. N.d. "Development Agenda for WIPO." http://www.wipo.int/ip-development/en/agenda/

WIPO. N.d. "Draft Substantive Patent Law Treaty." http://www.wipo.int/patent-law/en/harmonization.htm

WIPO. N.d. "Frequently Asked Questions: Internet Domain Names." http://www.wipo.int/amc/en/center/faq/domains.html

WIPO. N.d. *Intellectual Property: A Power Tool for Economic Growth*: http://www.wipo.int/about-wipo/en/dgo/wipo_pub_888/index_wipo_pub_888.html

WIPO. N.d. "Substantive Patent Law Harmonization." http://www.wipo.int/patent-law/en/harmonization.htm

WIPO. N.d. "The 45 Recommendations under the WIPO Development Agenda." http://www.wipo.int/ip-development/en/agenda/recommendations.html

WIPO. N.d. "Washington Treaty on Intellectual Property in Respect of Integrated Circuits." http://www.wipo.int/treaties/en/ip/washington/

WIPO. N.d. "What is WIPO?" http://www.wipo.int/about-wipo/en/what_is_wipo.html

WIPO - Standing Committee on the Law of Patents. 2008. *Report on the International Patent System*. SCP/12/3: http://www.wipo.int/edocs/mdocs/scp/en/scp_12/scp_12_3_rev_2.pdf

World Trade Organization (WTO). 2001. "Declaration on the TRIPS Agreement and Public Health." (14 Nov.): http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.htm

WTO. 2001. "Declaration on the TRIPS Agreement and Public Health." (14 Nov.): http://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_trips_e.pdf

WTO - Council for TRIPS. 2005. "Extension of the Transition Period Under Article 66.1 for Least Developed Members." (29 Nov.): http://www.wto.org/english/news_e/pres05_e/pr424_e.htm

Wright, Ronald. 2004. *A Short History of Progress*. Toronto: Anansi.

Writers Guild of Canada. 2009. "Writers Guild of Canada Presents New Ideas for More Canadian Stories Online." (24 Feb.): http://www.wgc.ca/images2/New%20Media%20Press%20Release%2002%2024%2009.pdf

X Prize Foundation. 2010. "Overview." http://www.xprize.org/x-prizes/overview

Yu, Peter K. 2005. "P2P and the Future of Private Copying." *University of Colorado Law Review*, 76: 653-765.

Zimmerman, Diane Leenheer. 2002. "Authorship without Ownership: Reconsidering Incentives in a Digital Age." *DePaul Law Review*, 52: 1121-1169.

Zimmerman, Diane Leenheer. 2010 "Cultural Preservation: Fear of Drowning in a Licensing Swamp." in *Working within the Boundaries of Intellectual Property: Innovation Policy for the Knowledge Society.* Rochelle C. Dreyfuss, Harry First and Diane L. Zimmerman, (Eds.), Oxford: Oxford University Press: 29-54.

Zittrain, Jonathan. 2004. "Normative Principles for Evaluating Free and Propriety Software." *University of Chicago Law Review*, 71: 265-287.

Curriculum Vitae

I. Education

Current: PhD Candidate (Library and Information Science) - University of Western Ontario (UWO), Faculty of Information and Media Studies (FIMS)

2007 Master of Library and Information Science – UWO, FIMS

2005 Bachelor of Arts (Hons). (History) - University of Waterloo, Faculty of Arts

II. Teaching and Research Experience

2012 Graduate Research Assistant, UWO, FIMS – Social Sciences and Humanities Research Council of Canada (SSHRC) Knowledge Synthesis Grant on Leveraging Public Investments in Higher Education Research and Development to Stimulate Innovation

2011 Graduate Research Assistant, UWO, FIMS – Graphics, Animation and New Media (GRAND) Networks of Centres of Excellence of Canada (NCE), Digital Infrastructures Project

Lecturer, UWO, FIMS – Information Policy (LIS 9130)

2010 Lecturer, UWO, FIMS – Research Methods and Statistics (LIS 9004)

Graduate Research Assistant, UWO, FIMS – FIMS User Generated Content Research Group, SSHRC Knowledge Synthesis Grant on the Digital Economy

Teaching Assistant, UWO, FIMS – Foundations of Library and Information Science (LIS 9001) and Research Methods and Statistics (LIS 9004)

2009 Teaching Assistant, UWO, FIMS – Research Methods and Statistics (LIS 9004) and The Matter of Technology (MIT 1500)

2008 Teaching Assistant, UWO, FIMS – Foundations of Library and Information Science (LIS 9001) and The Matter of Technology (MIT 1500)

2006 Graduate Research Assistant, UWO, FIMS

III. Relevant Professional Experience

2006 Reference Librarian, Transport Canada Library, Ottawa, ON, Canada

2004-2005 Researcher and Statistical Assistant, Canadian International Trade Tribunal, Ottawa, ON, Canada

IV. Scholarly Contributions

Publications

McNally, M.B. (2012, accepted). Intellectual Property Rights, Innovation and Theories of the Information Society: Why Proponents of the Information Age Fail to Account for Intellectual Property. In *Intellectual Property for the 21st Century: Multidisciplinary Approaches to Intellectual Property Law*. Teresa Scassa, Mistrale Goudreau, and Madelaine Saginur (Eds.). Chapter 24.

McNally, M. B. (2010). Enterprise Content Management Systems and the Application of Taylorism and Fordism to Intellectual Labour. *Ephemera: Theory & Politics in Organization*, 10(3/4): 357-373. Full text available: http://www.ephemeraweb.org/journal/10-3/10-3mcnally.pdf

Co-authored Publications

Trosow, S. E., Burkell, J., Dyer-Witheford, N., McKenzie, P., McNally, M.B., Whippey, C., & Wong, L. (2010). *Mobilizing User-Generated Content for Canada's Digital Advantage*.
Full text available:
http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1022&context=fimspub

Conference Presentations

McNally, M. B. (2011). Supporting Alternative Incentive Mechanisms for Digital Content: A Comparison of U.S. and Canadian Policy. Presented at the 31st Annual Conference of the Canadian Communication Association, University of New Brunswick, Fredericton , NB, 2 June, 2011.

McNally, M. B. (2011). Reconciling the Federal Government's Information Economy Rhetoric and the Abandonment of the Long-Form Census. Presented at Coming to Our Senses: Theorizing the Contexts and Impacts of Making the Census Long-Form Voluntary, University of Ottawa, Ottawa, ON, 26 Mar. 2011.

McNally, M. B. (2010). Media and Propaganda in the USSR 1917-1939. Presented at the 30th Annual Conference of the Canadian Communication Association, Concordia University, Montreal, QC, 1 June, 2010.

McNally, M. B. (2010). A Political Ontology of Intellectual Goods. Presented at Connections 2010, University of Western Ontario, London, ON, 16 May, 2010.

McNally, M. (2009). Content Management Systems and the Degradation of Intellectual Work in the 21st Century. Presented at Digital Labour: Authors, Workers, Citizens, University of Western Ontario, London, ON, 17 Oct. 2009.

McNally, M. (2009). The Influence of Washington's Farewell Address on the American Intellectual Property Debate in the Late 19th Century. Presented at the 37th Annual Conference of the Canadian Association for Information Science, Carleton University, Ottawa, ON, 30 May, 2009.
Full text available: http://www.cais-acsi.ca/proceedings/2009/McNally_2009.pdf

Invited Presentations

McNally, M. B. (2012). Democratizing Access to Knowledge: Find out What Open Educational Resources Have to Offer. Presented for Western Libraries and the Teaching Support Centre, London, ON, 7 Mar. 2012.

McNally, M., Whippey, C. & Wong, L. (2011). Mobilizing User-Generated Content for Canada's Digital Advantage. Presented for the FIMS Brown Bag Series, University of Western Ontario, London, ON, 23 Mar. 2011.

McNally, M. B. (2011). Copyright and Librarians: Roles and Responsibilities. Presented for the Southwestern Ontario Health Library Information Network, London, ON, 9 Dec. 2011.

V. Scheduled Scholarly Contributions

Conference Presentations

McNally, M. B. (2012). Theories of the Information Society, Innovation and Intellectual Property. To be presented at Multidisciplinary Approaches to Intellectual Property Law, Ottawa, ON, 25 May, 2012.

McNally, M. B. (2012). Foreign Investment and the 700MHz Spectrum Auction. To be presented at the 32nd Annual Conference of the Canadian Communication Association, University of Waterloo and Wilfred Laurier University, Waterloo, ON, 30 May – 1 June, 2012.

VI. Professional Contributions

2009-2010	Connections 2010 Conference Organizing Committee, University of Western Ontario (UWO)
2009-2010	Treasurer, Library and Information Science Doctoral Students Association (LIS-DSA), UWO
2007-2009	President, LIS-DSA, UWO
2003-2005	President, Applied Studies Student Association (ASSU), Faculty of Arts, University of Waterloo

VII. Award and Recognitions

2009-10 Ontario Graduate Scholarship (value: $15 000)

2005 Dean’s Honours List (University of Waterloo)

2000 Arts Entrance Scholarship (University of Waterloo)