



2004

No.04-47

Technology, Justice and Imagination
Intellectual property rule-making for the digital
economy

Dieter Zinnbauer

Published: 2004

Development Studies Institute

London School of Economics and Political Science

Houghton Street

Tel: +44 (020) 7955 7425/6252

London

Fax: +44 (020) 7955-6844

WC2A 2AE UK

Email: d.daley@lse.ac.uk

Web site: www.lse.ac.uk/depts/destin

Technology, Justice, and Imagination

Intellectual property rule-making for the digital economy

Research Paper for Carnegie Council on Ethics and International Affairs
Fellowship Program: Justice and the World Economy, 2002-03

**Draft, please do not quote or reference without explicit permission
of the author**

Dieter Zinnbauer

Development Studies Institute, London School of Economics

Version 1.2, November 2003

Contact: d.zinnbauer@lse.ac.uk

Table of Contents

I.	Introduction	4
II.	IP and the digital economy – the predominant story line	6
A.	A story about creating stories	6
B.	The story of IP	9
III.	Dissecting the story	11
A.	The normative bias of metaphoric choice	11
1.	Encoding freedom and autonomy – ‘property’ as adequate paradigm?	12
2.	The blurry properties of property	14
3.	A fresh start	15
4.	Exclusive ownership for fairness?	16
5.	Exclusive ownership for personhood?	17
6.	Synopsis: the normative expectations on intellectual property: freedom, security, personality, equality.....	19
B.	The utilitarian discourse on IP	19
1.	Theoretical support for stronger IP?	20
2.	Empirical evidence.....	25
C.	From evidence to policy.....	27
IV.	Digital artifacts – the dawn of a new enclosure?	28
A.	Deepening entitlements	28
1.	Technological developments: Digital Rights Management	28
2.	Emerging regulatory outpacing: from public to private ordering	32
B.	Broadening entitlements	33
1.	The breakdown of the idea/expression dichotomy	33
2.	Nuisance or trespass? The stricter interpretation of IP violations.....	35
3.	Lowering the threshold of originality/invention.....	35
4.	Sweat-of-the-brow protection.....	36
5.	The privatisation of information services	36
6.	Summary	37
C.	The implications for international justice.....	38
1.	From claims on the present to claims on the future.....	39
2.	Exclusivity and opportunity	39
3.	The magnitude of welfare gains.....	41
4.	Procedural aspects of distributive justice.....	42
V.	Beyond the towards: just arrangements for a global digital economy	48
A.	Discourse: imaginative tropes and framings for a less biased approach.....	49

B.	Technology as site of agency and principled action: the example of open source software	49
C.	Content: Reworking incentives and models for broader access.....	53
D.	IP rules and procedural issues	56
VI.	References	59
VII.	Annex	66

I. Introduction

As I have come to recognize during my inquiries, it is impossible to evaluate the adequacy of specific intellectual property arrangements from a distributive justice point of view *without* addressing broader issues. A thorough discussion of distributive justice issues inevitably raises more fundamental questions of how we think about intellectual property, what values we associate with it and how we perceive the involved trade-offs. Sooner or later a justice-oriented reasoning about intellectual property (IP) needs to engage with a set of fundamental shared beliefs about the values that IP systems encode and promote. If a focus on justice ignores these normative intuitions and compelling utilitarian claims, it will be irrelevant, for these tropes form the predominant and very compelling frame for the ongoing IP policy discourse. And the pecking order of values and aims drawn up in the predominant discourse demotes fairness and justice considerations to narrowly-construed end-of-the-pipe policy fixtures at the exceptional margins of human emergencies such as the HIV/Aids crises. But it does not treat distributive issues as central to the IP rule system.

Taking these commonsensical tenets that generate this pecking order head on is not only necessary to stake out a visible claim, but also opens the opportunity to intervene on a more fundamental level and widen the scope of imaginable options for reorganizing societal arrangements with regard to digital technologies.

This is a steep agenda and the chosen line of reasoning thus faces an uphill battle in several respects. For a start, it appears necessary to draw out some interrelations between the concepts of technology, justice and imagination, three terms that do not really seem intuitively compatible.

How does for example, the arcane business of technocratic administration of a technology relate to issues of distributive justice?

Two justifications come to mind. First, distributive justice in a more encompassing and sustainable conceptualization can go beyond the consequentialist analysis of a distribution of specific technological benefits and risks. Including a notion of procedural justice opens the arrangements for technology governance to scrutiny with regard to their inclusiveness and fairness. But this would not matter much if governance meant simply the administration and management of a technological reality predetermined by the particular properties of the technical artifacts at hand. This is where the second justification comes in: technology is neither value free, nor inevitable or immutable. It is malleable and it is political. It allows for agency and provides us with a range of possible arrangements, trajectories and value-trade-offs to choose from. And principles of distributive justice are important criteria in this choice. The possibility of choice leads directly to the role of imagination. Technological choice is

choice under uncertainty. It means selecting from an open set of future options, some of them unknowable, all of them uncertain to varying degrees. Imagination is vital for widening the horizon, for becoming aware of the range of technological outcomes we might aspire to and chose from. Technology and imagination are not antipodes but siblings. Imagination drives technological innovation and in turn technological progress fires up imagination, also the imagination about how technology provides novel opportunities for justice and a reworking of societal structures to this end. But imagination interrelates with technology and justice also in a more fundamental sense. Not only does it widen awareness of future options, it also structures how we see technology, how we perceive its effects. And an inquiry into the justice dimension of an existing technology can be an imaginative exercise. It offers a fresh perspective on a specific technological arrangement, widens the range of permissible arguments and the legitimate circle of discussants.

At this point this is a highly abstract and stylised sketch. But the triangulated interplay between technology, justice and imagination will become clearer in the course of the argumentation. It provides the overall leitmotif and invites to organize the argument into the following components:

The first part is all about imagination, a central factor when dealing with the *'what is?'* and *'what should we do?'* with regard to digital intellectual property.

In short I attempt an imaginative rewiring of the intellectual property discourse. As outlined at the beginning, taking on the fundamental storyline on IP appears indispensable. Sooner or later, the discussion of specific policy details runs up against what are often implicit descriptive and normative presumptions that heavily prejudice the discourse, despite their questionable validity. Making these presumptions explicit and exposing their tenuous nature is a necessary step for outlining plausible alternatives. The strategy of choice for this endeavour is creative destruction. The demolition work involves an examination of the predominant conceptual, empirical and normative templates that steer intellectual property policy-making. They are found to be incomplete and inconclusive at best, misleading and biased at worst.

This might reek of a pathetic or quixotic endeavour to take on tried and tested windmills of intellectual property thought. But it really is only the patient assembling of various dispersed but pre-existing conceptual splinters and think bites, whose combined presentation is hoped to push the imaginative boundaries a little bit.

This conceptual reframing sets the stage for the second part, a more open and imaginative discussion of practical concerns and trends with regard to intellectual property rules for the digital economy. Along the way I will emphasize 'distributive justice' as an analytical corrective and argue that it offers a fresh and richer perspective on intellectual property in the digital realm. The scope and complexity of the issues makes an exhaustive discussion

impossible. I will confine myself to some high profile developments that illustrate what is at stake.

In order to avoid instant obsolescence in a rapidly evolving socio-technical environment the analysis does not so much dwell on the status quo as it takes a forward-looking approach. A more speculative outlook directs attention from current benefits and costs to future opportunities and challenges. The added uncertainty and higher margin of error appears justified. It is offset by enhanced opportunities to move beyond reactive end-of-the-pipe fixes to more profound questions of institutional choice and thus consider a more encompassing, systemic notion of justice.

The concluding part is the most positive. And the most difficult. It seeks to move from conceptual critique to practical ways forward. I will try to point out some feasible innovative proposals that translate concerns of fairness and global justice into workable institutional arrangements for ownership and access in the digital age. And I will argue that we have already moved beyond mere scenario-building and can already find incipient proof of concept, offering a reasonable justification for more imaginative digital IP policies.

Overall this project is one that emphatically signs up to a pragmatist ontology, Dewey style, that views *“formative contexts of social life or the procedural frameworks of problem solving and interest accommodation ... as ... frozen politics: conflicts interrupted or contained.”* And flowing from this is the rewiring of imagination exercise at the core of this study that hopes to make a small contribution to *“deprive these frameworks of contexts of their aura of higher necessity or authority”*.¹

II. IP and the digital economy – the predominant story line

A. A story about creating stories

Scholarly and populist pundits alike have left no doubt that the advent of novel information and communication technologies in tandem with economic globalization is profoundly restructuring the modalities of economic production and the nature, as well as distribution of related opportunities in the world economy. A swirl of new and often dramatic catchphrases lends expressive power to these observations. The formula is as follows. In ascending order of visionary gravitas nouns such as ‘industry’, ‘economy’, ‘society’ and ‘revolution’ are prefixed with a choice of ‘post-industrial’, ‘weightless’, ‘digital’, ‘information-’, ‘knowledge-’ or simply ‘new’ and topped with a slightly subversive borderless, a more conventional ‘international or ‘global’ or the rather neutral yet still impressive ‘ubiquitous’ or ‘pervasive’. The ‘pervasive weightless economy’ evokes much the same sense of paradigmatic change as the ‘digital

¹ Rorty, 1988, p. 7.

revolution' or the 'global network society' and all place information and communication technologies (ICTs) at the center of these dynamics.²

Internet stock-bubble and a still tenuous statistical relationship between ICT investment and productivity growth have recently infused some sobriety. But the catchphrase cottage industry describes a phenomena of real economic and societal significance.

- The total value of E-commerce in the US has reached more than 15 billion USD in 2001.³
- Capital investment in ICT equipment and software accounts for more than 30% of annual capital formation in advanced Internet countries and is rising rapidly.⁴
- In countries at the forefront of ICT development such as Finland the value generated by the ICT sector already accounts for 15% of total business value added.⁵
- The ICT sector is a major driver for employment growth with an average annual growth rate of 4% in OECD countries between 1995 and 2000.⁶

These impressive figures notwithstanding, the most exuberant predictions for ICT in development have not materialized. Although most is still in flux and much inherently unpredictable, we gradually learn from emerging case studies that the Internet by itself does not usher in the ultimate demise of rent-absorbing intermediaries. Neither does it quite level the playing for small-scale entrepreneurs nor does it make likely the leapfrogging of entire stages of economic development for whole states as was an appealing idea for many policy makers.⁷ These sobering insights have reshuffled the discourse on ICT in development in two major ways. Unsurprisingly, the voices of long-time ICT critics have grown louder. They argue that society shapes technology, not the other way round and that powerful actors can be expected to be able to structure the adoption of novel technologies in ways so as to protect or even expand their own power base. And they feel largely proven right by ongoing developments.⁸ At the other end of the spectrum long-standing optimists have been prompted to revise their expectations and shed lingering sentiments of technological determinism, the idea that technologies are intrinsically transformative and quasi automatically restructure societal arrangements. But they have not given up yet and now turn their attention to the infrastructural and policy preconditions that are believed to be necessary to unlock the potential of ICT on a global level.

² For seminal contributions see Quah, 1999 (weightless economy); Mansell/When, 1998 (knowledge societies); Bell, 1976 (post-industrial society); Castells, 1996 (network society); Worldbank, 2000 (network revolution).

³ See US Department of Commerce: E-Stats Briefing, March 19, 2003.

⁴ See OECD, 2002, p. 11.

⁵ See OECD, 2002, p. 22.

⁶ See OECD, 2002, p.

⁷ See for example the research project on global B2B e-commerce by LSE/IDS Sussex (See Humphrey et al., 2003).

⁸ See for example Schiller, 1999.

Both positions have their weak spots. The luddite variant scoffs at technological determinism – and often replaces it with an equally undifferentiated social determinism. Where fundamental systemic deficiencies are believed to determine the final outcome the nitty-gritty can be ignored and skipping a serious engagement with the specificities of the technology and possible policy levers is considered to be justified.

Persistent techno-optimists on the other hand develop their newfound policy-contingency often only into a simple laundry list of desirable policy parameters, implying a simplistic conception of agency. Quite often they end up with commonplace prescriptions for development such as infrastructure investment, education and good governance but pay little attention to how these superficially compelling rules play out in an environment that is fraught with multiple asymmetries or on how these asymmetries structure the entire rule-making process in the first place.⁹

In a peculiar way the two positions feed on each others and effectively hamper a constructive dialogue. Luddites scoff at the political naivety of techno-optimists, while the latter complain about the technology ignorance of these skeptics. As a consequence, a critical appreciation of systemic deficiencies and policy interdependencies rarely productively interacts with intimate knowledge of the technology. And the situation is not helped by the abstention from the policy discourse of large parts of the technology community. Many influential Internet developers espouse a radical libertarian position and regard any policy-intervention as bad, since it potentially curtails their individual freedoms to develop and use technology.¹⁰ This 'interlocking disconnect' pervades the technology discourse in academia and the development practitioners community alike. Policy-makers in developing countries that need to make concrete choices with regard to rules for a specific technology are thus left with little more than generic guidance for good governance and economic management modeled on the rules of industrialized countries. Against this backdrop of lackluster guidance by the academic and development community, lobbyists have a field day in framing the more practical discourse and translating elusive reference points into concrete rules that are conducive to their private but not necessarily to societal ends.¹¹

This is a very, simplistic generalization, impossible to prove and subjective, based on participant observation at numerous policy conferences, policy strategy meetings in the development practitioners', technology and academic community. Despite its stylized character, it is important, since it makes visible some dynamics that underpin the creation and transmission of policy relevant knowledge on technologies in development. In that sense, it is

⁹ An outgrowth of this are for example the recommendations by the Digital Opportunity Task Force, 2001.

¹⁰ For evidence on the libertarian bent of advance Internet practitioners see Norris, 2001, chapter 10.

¹¹ Some specific characteristics of the political economy of IP rulemaking are considered later (IV.C.4.a))

a first step towards an imaginative rewiring of the narrative , perhaps more as backdrop for the story than a major building block, but nevertheless part of it.

B. The story of IP

So what does the main narrative on IP and ICT in development look like?

The story usually goes as follows: ICTs offer unprecedented economic opportunities for developing countries, but a number of enabling policies need to be put in place, in order to realize this potential. Alongside general principles of sound economic management and market development such as liberalization of telecommunication markets and development of the human resource base, intellectual property protection is considered as instrumental to reaping the benefits from the digital revolution. It is part and parcel of creating a sound investment environment. It is a prerequisite for attracting foreign investment by new economy companies, whose competitive advantage is built around an intellectual asset base. As a consequence these companies fiercely guard their intellectual assets and would never dare to jeopardize them through locating production in countries that do not provide sufficient legal protection. But attracting high-tech FDI is only one reason for IP. Equally important, intellectual property protection is considered indispensable for building a vibrant and innovative domestic ICT economy. Widespread piracy and disrespect of intellectual property frustrate potential new economy entrepreneurs. They make business models unviable, destroy incentives for innovation and creative activity and discourage domestic investment. Who would aspire to set-up a software company, when the pirates are already waiting on the doorstep, ready to churn out cheap copies of ones own innovative idea, dispersing revenues and making it impossible to even recoup initial development costs? For these reasons, the story goes, insufficient intellectual property protection will paralyze the domestic innovative capacity of developing countries and lock-them into permanent dependence upon digital imports from industrialized nations that encourage innovation and provide their own ICT entrepreneurs with strong IP rights.

In international perspective IP appears not only as a *conditio sine qua non* for taking part, but also as a unique opportunity for catching-up: mutual recognition of intellectual property entitlements as stipulated in international IP regime provides the chance for David to reap worldwide benefits from its creative and innovative activities by granting legal protection against Goliath's intimidating copying and imitation capacities.

To put it bluntly, IP becomes the stirrup for equal opportunity, a prerequisite for the global version of the American dream. It is the innovative idea and creative achievement that is rendered relevant and fairly rewarded. Everyone has a chance. Existing advantages in implementation capacity, marketing, capital access etc. weigh less. These facilities can also be harnessed by everyone, even the foreign inventor, as long as she can turn her idea into a protected asset abroad.

This IP narrative is not new, but, as mentioned earlier, it has been infused with a particular urgency with the advent of the digital economy. Novel ICTs have not only given rise to the weightless economy whose lifeblood are intellectual rather than physical assets. But, the story continues, they also provide the very tools to destroy intellectual property in the most effective way imaginable. Infinite numbers of identical copies can be made from any kind of digital artifacts at negligible costs. What's more the Internet also provides the medium for distributing these pirated wares almost anywhere, almost instantly, again at very marginal costs. As a consequence, inventors and creators are in danger of losing complete control their property. They are routinely robbed of their brainchild, even before they chose to introduce it to the public. And finally, Internet culture has turned piracy into a widespread popular pastime and at its most sophisticated or heinous a sort of competition sport among some programming elites.¹²

It is this perceived imminent elimination of digital intellectual property that generates a particular sense of urgency. Stronger IP protection is no longer only viewed as a proactive measure to partake in the global digital economy, but as a vital necessity to defend the status quo, restore law and order and reinstate the protection of property and fair rewards for innovation that has come under threat.

This predominant descriptive and prescriptive narrative is ubiquitous. It inhabits numerous consultancy reports and research papers and is featured in ICT policy frameworks and strategy documents.¹³ Not always are all components spelled out. Sometimes the prescriptive part of the story is tempered somewhat by inserting a reference to the need to balance IP ownership and access issues. And where this general statement is carried over into practical policy recommendations, it usually takes the form of suggesting a limited 'fair use' right for specific groups, such as educators, as a narrowly defined exception to the general rule of strengthening individual ownership.

These qualifications on the margins notwithstanding, the story outlined above represents the common frame of thinking IP for the digital economy. The premises of a 2003 high-level WIPO summit on intellectual property in the knowledge economy encapsulates this message:

Today, a state does not have to be "lucky" – in terms of its possession of land, labor and capital – to succeed. Creativity and innovation are the new drivers of the world economy and national well-being increasingly depends on the strategy a country develops to harness this intellectual capital. An effective intellectual property system is the foundation of such a strategy. Within knowledge-based, innovation-driven economies, it is a dynamic tool for wealth

¹² For exemplary framings of this kind see Covelli, 2001, pp. 23-24.

¹³ See for example Worldbank 2000, p. 93; on WIPO's position see WIPO, 2002, in particular chapter 5; for the predominant framing at WTO see for example Council for Trade-Related Aspects of Intellectual Property Rights, 2003, item 40. for an exemplary integration into a development policy strategy paper see the repeated single-sentence reference to IP protection in: South African Development Community, 2002; for the position taken by the G8 see G8, 2000.

creation – providing an incentive for enterprises and individuals to create and innovate; a fertile setting for the development of, and trade in, intellectual assets; and a stable environment for domestic and foreign investment. ¹⁴

One might like it or not, but when arguing the case for a somewhat different take on IP regimes in the digital economy one needs to engage sooner or later with these fundamental arguments. In fact I would argue that it is necessary to do so right at the outset. No other vision can provide a convincing alternative and counter this extraordinarily compelling story line, without taking on its fundamental tenets and exposing their tenuous character.

III. Dissecting the story

Quinean holism helps assure romantics that we humans are lords of possibility as well as actuality –for possibility is a function of a descriptive vocabulary and that vocabulary is as much up for political grabs as anything else (Richard Rorty)¹⁵

It is not surprising that the ‘*stronger IP for unlocking the ICT revolution*’ narrative has gained such popularity. Political economy arguments aside, the storyline represents an amalgamation of metaphors, conceptual models and empirical evidence that evoke commonsensical ideas about the working of the world, strong normative intuitions about the values at stake and what would constitute a fair allocation of benefits and burdens. In the following sections all these elements are subjected to a closer inspection.

A. The normative bias of metaphoric choice

Taking on moral, in addition to strictly utilitarian arguments is particularly important, when one ultimately wants to put together a principled line of reasoning as is the case here with the focus on global justice. Unfortunately, a case for distributive justice is extraordinarily difficult to make, when the vocabulary and the dominant metaphors used to describe the phenomena at hand are heavily charged with normative connotations. The shared understanding of the problematic is one of ‘property’ on the one hand and ‘theft’ or ‘piracy’ and lately even terrorism¹⁶ on the other, thereby eliciting some of the most value-laden categories in political thinking and related principled belief systems. Invoking property rights for one side and theft on the other marks out the moral starting point in the most effective way. It makes clear on which side entitlements are situated and places the burden of justifying what can only be imagined as narrow exemptions and reassignments fully on the side of the ‘expropriator’. The

¹⁴ WIPO Summit on Intellectual Property and the Knowledge Economy: Introductory Premise, scheduled for April 2003 (postponed because of SARS) (www.wipo.int/summit-china/en).

¹⁵ Rorty, 1988, p.8.

¹⁶ See for example the oversight hearing on “International Copyright Piracy: Links to Organized Crime and Terrorism” organized by the US House of Representatives Committee of the Judiciary, March 13, 2003.

pirate has to prove that he is not a pirate, and even if he isn't this does not automatically legitimate trespass into private property. To put it more bluntly, the framing of the issues around a property metaphor is perhaps the single most effective semantic move to prejudice the argument. What's more, designating something as property not only evokes instant political allegiance but also sets into motion a quasi automatic process of doctrinal accommodation in the legal system. Once the definition of property is accepted the scope for rule-making in the digital arena shrinks to the task of systematizing novel technological challenges into established legal categories and reinstate the efficacy of established principles.¹⁷

1. *Encoding freedom and autonomy – 'property' as adequate paradigm?*

But this all should not matter much, if intellectual property simply *is* the beast it is alleged to be: a subset of property. At least from the perspective of the property doctrinaire we might then simply end up with a strong normative template for making rules in the digital realm and need not bother too much about opening a Pandora's box of conceptual and normative uncertainty. However, there are good reasons to believe that this is not the case.

Intellectual property and related legislative principles diverge from what is commonly understand as property in important ways. First, it is difficult to reconcile an absolute property concept with the important idea/expression dichotomy as provided for by IP law. Ideas are usually believed not to be appropriateable. Only a specific expression of an idea in the form of a book, a piece of art or a technical apparatus that embodies the innovative principle enjoys protection. This is a central tenet in intellectual property rule-making. Besides utilitarian considerations to be addressed later, this distinction is also underpinned by a moral argument. It reflects a general unease over how to conceptualize human creativity and innovative effort and thus ultimately reflects the ambivalence over the epistemic and ontological foundations of our world. Is $E=mc^2$ a discovery or an invention? And in any case, should an individual be able to own it? Is the simple idea of visually emulating an office desktop for intuitive operation of a computer worthwhile protection? IP rules struggle with these questions on a daily basis and the idea/expression distinction is one principle to strike a compromise. Other calibration tools include the legitimate scope of patent protection, the criteria for originality and innovative step and most importantly, the limited duration of protection. The details do not matter here. Important is the general point that intellectual property rules struggle with an enormous moral ambiguity about what should and what should not be protected.¹⁸ The criteria for legitimate protection are very different from the criteria for legitimate ownership of a piece of land or a car, making the use of the term property appear as a potentially misleading choice.

¹⁷ For an account of the moral power of legal rules and classification see Balkin, 2003.

¹⁸ See Stern, 1999.

More importantly, the nature and consequences of violating the respective rights are fundamentally different. Stealing the neighbors horse directly deprives the neighbor of enjoying his possession. Imitating the neighbor's garden design does not prevent the neighbor from retaining it herself, Strictly speaking, nothing is taken away. In economic terms, ideas or information are nonrivalrous.¹⁹ This is a platitude, but in morally charged debates on intellectual property theft it is almost never recognized. Sadly so, because from a fairness perspective it is an important distinction. For ownership arrangements for nonrivalrous goods the trade-off between benefits and burdens and their allocation among the parties is very different. Lumping *seizure* and *imitation* together under the label *theft* appears not very helpful to make an informed choice on the legal protection rules that ought to apply to each category. A general objection that this line of reasoning usually triggers is that in both cases the owner might experience harm, the nonrivalrousness of the good in one case notwithstanding. However, that a change and in *entitlements* takes place in both situations is not denied. The point is only that the damages are different in nature. Having one's horse stolen creates a different type of loss than having one's idea imitated. Both might diminish the value of a property bundle held by the previous owner, but in the case of theft the action of the thief directly and immediately effectuates an equivalent loss on the owner's side, whereas imitation does not directly impair the utility of the artifact to be enjoyed by the original owner. His use of his idea or innovation is left untouched.

This argument is usually difficult to stomach for a fairness-minded person, who might angrily object that this rhetoric difference does not really matter, since it might generate the same consequences. After all, the original inventor might be deprived of a fair reward for the fruits of her creative work, a line of reasoning often traced back to the labor desert theory proposed by Locke.²⁰

However, the nature of this harm is different, it is not directly related to the act of imitation. Possible losses take the form of a dilution of marketability and are thus mediated through a vast variety of market factors. It is not plausible why ex-ante these two cases should be conceptualized and judged alike. To illustrate this a little better: treating a loss in market value as a harm that entitles to compensation or must be prevented in the first place is a principle that is usually frowned upon.²¹ It is the very essence of the market to allocate limited resources efficiently by creating and destroying values qua the price mechanism. The market is held to be efficient, not fair. It does not endorse outright theft, but is meant to encourage competition. Protectionism is deemed necessary to help people that fall between the cracks, but it is rarely viewed as *morally* legitimate to protect someone's monopoly profits at the expense of efficiency. At least this is how the market liberal argument usually goes.

¹⁹ See Shapiro/Varian, 1999, Quah, 1999.

²⁰ See Fisher, 1998.

²¹ One might argue that compensation is justified when the loss is directly linked to a regulatory intervention. But as Singer shows this is problematic, since it confers undue moral privilege on the status quo, which is itself a product of prior regulations (see Singer, 2000, introduction).

The point here is not about coming down on one side or the other in the debate over how much social buffering for the market mechanism is justified. It merely serves to exemplify that the nature and underlying responsibilities for the ensuing losses resulting from physical theft and imitation are very different. Should a hot-dog seller who imitates his competitor's mustard recipe be treated the same, as when he steals the mustard pot? Maybe. Perhaps we can find plausible utilitarian arguments to justify that. Maybe the market cannot be efficient if we do not provide incentives for better mustard in form of temporary monopolies. But this is a utilitarian, not a fairness argument and will be considered later. Harm from physical theft and harm from imitation or copying are two very different things. Creating the impression of a moral equivalence is not helpful and unduly prejudices the choice of options with regard to defensible digital IP rules.

2. The blurry properties of property²²

Another line of defense for retaining the property analogy might be to unpack the concept of property and argue that both physical and intellectual property might only be different beast of property, but types of property nevertheless. According to this view, seizure in each case might have somewhat different consequences. But for both it entails the violation of the *right of exclusive use*, a central tenet in the property doctrine. This method of disassembling property into a set of rights, freedoms, privileges akin to a bundle of stick is a well established legal doctrine.²³ But going down this road has some very interesting ramifications. In essence, it puts a big question mark on the absoluteness and individualistic nature of entitlements associated with property and, centrally to our concerns, brings down the 'illusion of moral clarity' that the concept commands. When picking apart what property actually means and what different rights are associated with it, the concept dissolves into a complex agglomeration of entitlements and functionings that are neither clear-cut, nor can they be systematized into an internally consistent framework of rules.

As Joseph Singer has shown so masterfully, the concept of property is not really about the clearly defined task of ordering the relation between an individual and an object, but it is essentially about the messy sorting out of relationship between individuals and a variety of often competing and overlapping claims and entitlements they hold with regard to objects. In particular the claim of exclusivity, idolized by Blackstone in his paradigmatic description of property as the

*"sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe"*²⁴

is revealed as a chimera. How far does exclusivity go? Does ownership of a hammer entitle to smashing the neighbor's window, ownership of a store to shutting out people of different skin

²² For the following see Singer, 2000.

²³ See Rose, 1998.

²⁴ Quoted in Rose, 1998, p. 601.

color, ownership of a piece of land to erecting a building as tall as one wants? How long does absolute control last? Does ownership of a house at some point in time entitle to contractually bind all future owners to only use the premises for a specific purpose? Some of these questions have clear legal answers, some are very ambivalent, but none of the answers construe an absoluteness of exclusive control. All illustrate the contingent, constructed and interdependent features of property.

Or as Rose, a renowned property theorist puts it: “if the trope of exclusivity does any major disservice, it is to overstate the case, concealing the interactive character of property and giving an inappropriately individualistic patina to this most profoundly sociable of human institutions”²⁵

The question is not freedom or regulation, but how to create and balance different freedoms through what kind of regulation. In moral terms, ownership and the individual freedoms associated with it are not self-regarding. Property does not constitute a pre-regulatory state of maximum individual freedom but is socially constituted and at any point in time reflects a delicate balance among interdependent claims. Property and ownership are not absolutes. The use of these terms cannot serve as pretext to serve or abridge difficult choices as to a morally justifiable design and regulation of related social arrangements.

3. *A fresh start*

So what does that all mean for the metaphorical framing of the discourse on intellectual property?

Having gone that far and deflated the imagined moral absoluteness of property, it would not really matter any more, whether intellectual property should be called property or not. The normative prejudice of a fair original position made up of exclusive ownership does not find traction anyway.

But this differentiated view of property rarely features at the level of conventional policy discourse. Here the property metaphor serves as a moral sledgehammer for forging an absolutist mould for the problem. Where property and freedom are juxtaposed with piracy and terrorism, the many nuances and fundamentally conflictual nature of the concept cannot be appreciated. As I have argued, these differences are significant, in particular with regard to their implications for fairness. Rejecting the ‘*property*’ in *intellectual property* is thus not a cynical attempt to euphemize theft but a necessary step to correct normative bias in the conceptual vocabulary. But mere criticism is not sufficient. An alternative concept needs to be introduced to fill the semiotic void.

Help for this reframing comes from an unexpected ally: the language of intellectual property law itself provides for an alternative. In many jurisdictions fundamental legal protection extended to ideas and innovation is referred to as ‘a temporary monopoly granted by the

²⁵ See Rose, 1998, p. 632.

state'. Admittedly, this is a less catchy term that has been overshadowed by the ubiquitous intellectual property trope, which itself only gained currency in the late 18th century and gradually supplanted the term 'monopoly'²⁶. But a reorientation towards 'temporary monopoly' rather than 'property' as a conceptual anchor is advisable. It puts the discourse on what are fair rules for intellectual creations on a completely different, more open footing and helps to avoid undue subconscious constraints on the defensible rule-making space for intellectual artifacts.

4. Exclusive ownership for fairness?

From a market liberal perspective the switch from the property paradigm to a 'temporary monopoly granted by the state' comes with an unsettling somewhat totalitarian undertone, since it could arguably pave the way for infringement of individual freedoms and harm through illegitimate seizure. In a nutshell, I have addressed the freedom concern by reference to the fundamental interdependency and social construction of individual freedoms, in particular with regard to property. Similarly, due to the nonrivalrous nature of intellectual creations, the harm argument has been reduced to a labor-desert issue, which should concern market liberals for utilitarian but not for other normative reasons.

But the desert-desert argument might still bother someone who finds an intrinsic fairness value in meritocracy, along the lines of "innovators should be entitled to a fair return for their socially valuable accomplishments." From such an angle resort to "property-strength" protection rights might be enticing as a vehicle to deliver on these just rewards. This fairness appeal of intellectual *property* is further enhanced through the alleged protection it grants David's business start-up idea from being instantly stolen and exploited by Goliath's conglomerate. In this context intellectual property promises equality in opportunity.

However, on closer inspection neither of these concerns makes a strong point for retaining the property paradigm for fairness reasons.

The desert-desert argument needs to grapple with all the pitfalls that beset the efforts to sell market-generated meritocracy as fair. Are social arrangements that favor people with higher innate intellectual capabilities really fair? If sweat of the brow (or investment costs), should be the guiding criteria, what effort level and thus reward corresponds to originality? Why should intellectual creation be sheltered from competition, but not labor, which can also come with dramatic sunk investment costs in the form of education?

In this ambivalent context, intellectual property appears a very problematic vehicle to deliver on fairness. The latter point becomes even clearer, when we address the equality in opportunity claim. This argument is based on another strong but misleading imagery that is predominant in the intellectual property discourse: the lone inventor dreaming up creative

²⁶ See Fisher, 1999.

ideas in his garage. This picture contains two interrelated fallacies. First, innovations are rarely stand-alone or self-regarding. Second, innovative competition does not start from scratch with a level playing field. More realistically, the innovative process can be described as cumulative and interactive, building upon and interfacing with prior and supplemental innovations and ideas.²⁷ Against this backdrop excessive intellectual property protection stands to privilege the large, incumbent player, who commands a vast pool of intellectual assets that serve as fundamental intellectual building blocs in a specific industry or trade. Strong entitlements in conjunction with the resources to assert them through litigation can be wielded against novel entrants that seek to steal market share through implementing innovative follow-on ideas.²⁸ Climbing onto the shoulders of giants, to paraphrase a popular metaphor for innovative development, is difficult, if the giant has the right to shrug off the climber. In this context equality in opportunity is only a hypothetical conditions and ensuring public access rights as opposed to exclusive ownership might appear as the fairer option that helps level the playing field somewhat. As discussed later, this seems particularly plausible for the digital economy.²⁹

To sum this point up, implementing a strong property paradigm in order to further fair rewards or equality in opportunity is problematic. Strong intellectual property rights are ill-fitted to deliver on these objectives. At best they generate rewards for a selective few activities, but leave out others, raising questions of relative fairness . At worst they aggravate the problem of equality in opportunity rather than alleviate it. The relation between exclusive entitlements and fairness is less straightforward than it might appear at first sight, leaving open a legitimate role for intellectual property but strongly cautioning against overprotection.³⁰

5. *Exclusive ownership for personhood?*

Having addressed, freedom, protection from harm and equality another popular association between intellectual property and non-utilitarian normative goals needs to be examined. Quite often individual control over intellectual artifacts is justified by reference to an intimate link between creative activity and personhood. According to this view, begrudging innovators of their rights to steer the implementation and circulation of their creations is tantamount to defacing them and thus to denying the right to expressive self-actualization a vital condition for personhood and autonomy.³¹ This argument is considered to be of particular importance

²⁷ Section III.B.1.a) deals with these issues in more detail and provides background references.

²⁸ Empirical evidence confirms this. Lanjouw/Schankerman (2001) in a comprehensive analysis of patent litigation in the US find that larger firms are more likely to sue over patent infringements and that firms with large patent portfolios are less likely to get sued. Smaller rights holders are thus more likely to be taken to court and are found to avoid high-litigation industries. Allison/Lemley, 2000, p. 79., find that patents filed by small entities are mainly confined to mechanical inventions.

²⁹ See section III.B.1.c). The interactive and sequential characteristics of software development have been documented by Bessen/ Maskin, 1997.

³⁰ For a policy-oriented introduction to trade-offs between competition and IP see the expert testimony gathered in a series of public hearings by the US Federal Trade Commission on: "Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy" in 2002 (www.ftc.gov/opp/intellect/index.htm).

³¹ For an introduction see Holderness, 1998.

for the creative communities and thus copyright issues. However, several qualifications are necessary. First, the legal relationship between personal rights and intellectual property is unclear. Ubiquitous 'work for hire' clauses assign IP to the commissioning rather than to the creating agent, breaking the alleged link between control and personality. Most notably, this is the case for the US.³² Second, legal and technological innovations facilitate the separation of control and recognition of authorship. On the technical side, software and encryption techniques make it possible to inextricably link information about author and origin to a digital artifact and verify its integrity.³³ On the legal side, novel forms of contractual templates are being made available that protect authorship, but ensure access and contribution.³⁴ Moreover, other legal remedies such as libel laws exist to protect individuals from against misrepresentation and false allegations.

Third, technological and legal measures aside, respect for authorship is promoted through social codes of conduct in professional fields. Specific communities of practice have developed their own professional standards that allow for both access to authored works and respect for attribution. Academic communities for example recognize authorship through strict standards of referencing and by ostracizing plagiarism.

Other creative communities thrive even more on the constant refinement, reinterpretation and recombination of cultural repertoires, putting a big question mark on the concept of original authorship in the first place. In such a context exclusive control more plausibly stifles than promotes expressive freedom and creative plagiarism is viewed as a legitimate sub genre. Or from an even more fundamental post-modern perspective, claiming exclusive control over what is rather the constitution of a public persona than private personal rights seems questionable. It might be counterproductive in an environment where personalities are understood to be constructed and expressed through adoption or creative re-interpretation of established cultural signifiers, including commercial brands.³⁵ From this perspective personality rights associated with authorship overlap heavily with freedom of expression issues, which are found to clash frequently with intellectual property protection, in particular in the digital environment.³⁶

To put it more bluntly, the strong positive link between intellectual property and personality rights that is often invoked in IP debates is very questionable. Technological, legal and social arrangements exist that protect personality rights more effectively than the coarse and often counterproductive instrument of exclusive ownership.

³² See Hoderness, 1998.

³³ See Gervais, 1999.

³⁴ For more on this initiative called 'Creative Commons' see section V.C.

³⁵ For an exhaustive discussion on the interplay of culture and authorship and the stifling rather than enabling effects of IP see Coombs, 1998; Boyle, 1996.

³⁶ For a documentation of digital cases, in which IP legislation is used to stifle expressive and artistic freedom see www.chillingeffects.org; for a conceptual analysis see Cohen, 2001.

6. *Synopsis: the normative expectations on intellectual property: freedom, security, personality, equality*

Evaluating social arrangements for intellectual artifacts through the analytical lens of 'property' is tempting but misleading. On the surface, applying the property concept seems to make a lot of sense. It provides a suggestive conceptual toolbox for organizing thinking on intellectual artifacts. What's more, it also comes with a compelling normative framework that seems to appropriately encode a wide-range of non-utilitarian values such as freedom, personality, or equality. In other words, it appears to provide an adequate moral compass for choosing rules on intellectual artifacts. But this is exactly where the problem is. As I have argued the property paradigm and the strong normative connotations it commands threaten to constrain and prejudice the debate on what constitutes fair rules for ideas and innovations. Its strong normative presumptions convey a moral absoluteness that does not adequately reflect the complex array of competing values and their trade-offs that attach to intellectual artifacts.

As opposed to physical property, the act of innovation or creation is constituted differently. Likewise, imitation is very different from physical theft and interacts with values such as freedom or safety from loss in different ways. These important divergences are difficult to recognize and translate into appropriate policies under a property paradigm. In addition, the often implicit claims that an intellectual property frame furthers the protection of equality in opportunity and personality rights deserve serious qualifications.

These conclusions by no means constitute an exotic re-reading of the conceptual background for IP policies. They rather re-emphasize some basic caveats on innovation and intellectual creation, that have long informed fundamental doctrines in IP rule-systems. Unfortunately this differentiated view on ownership and innovation is increasingly overshadowed by a crude property analogy. Switching back from piracy and property to temporary monopoly granted by the state helps to clear this implicit but misguided normative underbrush. It thus provides for a good starting point to address the central rationale for IP protection: the utilitarian claim that it is an indispensable vehicle to generate innovation and thus an essential driving force for human progress.

B. The utilitarian discourse on IP

As indicated by the ICT for development story outlined at the beginning, the utilitarian importance of IP stems from two interrelated claims. The first one is that temporary monopoly rights are required to create incentives for investment into innovation that would not take place, if rents are instantly competed down to zero through imitation. The second one is that strengthening weak intellectual property protections is of particular importance for developing countries that want to attract foreign direct investment and create local knowledge economies.

Just like the property analogy, both of these claims are seemingly self-evident, easy to communicate and thus usually command the status of economic truisms. Their uncontested standing is such that policies to the contrary are regarded as legitimate only at the most tragic edges of life-saving medication. These emergency exceptions aside, the utilitarian orthodoxy views support for low intellectual property standards at best as misguided infant industry protection, but more typically as short-sighted instant gratification and free riding that squanders long term development opportunities. But is the relation between IP, innovation and ultimately development as strong and unquestionable as asserted? To be fair it is epistemologically impossible to verify a causal link between two complex phenomena and unequivocal proof cannot be the benchmark to hold a piece of evidence up to. However, given the assuredness with which this claim is usually made and the captivating popularity it enjoys in the IP discourse, it seems advisable to probe a little deeper and, where applicable, highlight divergences from the orthodoxy that would suggest a more cautious approach for IP policy-making. This examination requires to consider both theoretical and empirical arguments.

1. Theoretical support for stronger IP?

a) Promoting innovation

Neo-classic economics, today's orthodoxy in economic theory, typically encodes the IP-innovation relationship in a model on investment behavior. At its most basic, the model leads to the conclusion that higher expected returns, as associated with stronger IP protection, makes investment into R&D more attractive relative to other uses of income. As a consequence, scarce resources are shifted from consumptive to investment activity, laying the basis for innovation and growth.

This unequivocal conclusion however, comes already under pressure, when the model is only marginally expanded and a two step-innovation process is introduced, in order to approximate a more realistic innovation environment. Bessen and Maskin provide a basic model for this case. They conclude, that overly strong IP protection can stifle follow-on innovations and does not provide socially optimal investment decisions.³⁷ Unsurprisingly, introducing more real-life complexity does not help to regain clarity in results and policy implications. The emerging picture from a large body of literature is that the prevalence of a cumulative and

³⁷ Peculiarly, this model has been rejected as not adequately reflecting the realities of the innovation process, by some legal observers, who prefer to stick to the even more simplistic isolated innovation model outlined at the beginning. However, as high-level economic abstractions both models are valid examinations of isolated effects under very specific stylized assumptions. Only the Bessen model relaxes a crucial assumption and replaces it with a more plausible one.

interdependent innovation processes requires a careful calibrating of intellectual property rights for maximizing overall innovative activity.³⁸ Private contracting is only considered an imperfect tool for recombining fragmented intellectual property rights, in order to remove blockages and hold ups by individual rights owners. Transaction costs and strategic behavior in view of competition and the protection of prior investments provide major stumbling blocs and a wasteful use of resources.³⁹ The theoretical and empirical salience of these hold-up problems has inspired an important conceptual innovation in orthodox economic theory and an entire school of thinking around it: the concept of the anti-commons. While the concept of the *commons* refer to the economic problem of overuse of resources for which no one holds effective rights to exclude others, the anti-commons provide the symmetrical antipode: it refers to a situation in which resources remain *underused* because *everyone* holds effective rights to exclude others, and no one can exert meaningful usage privileges. With regard to intellectual property, the commons problem applies to a situation without any IP rights whatsoever, whereas the anti-commons apply to a situation of too strong and too fragmented exclusive ownership rights. The ensuing policy challenges is to find a middle-ground for IP protection between these two symmetrical problems, rather than seeking a continuous expansion of IP. It is worthwhile noting that all these refinement take place within the orthodoxy of neo-classical thinking. This evolution in economic thinking has yet to find its way into the IP policy discourse. This is quite surprising given that the concept of the anti-commons has also gained ground in legal scholarship where it ultimately echoes the concerns about the fallacy of a self-regarding conception of property rights outlined earlier.⁴⁰ The current lack of consideration for these novel insights indicates a considerable policy lag or disconnect. However, the significant policy impact that the concept of the 'commons' eventually gained in the environment debate provides reason for optimism. Interdisciplinary support and appeal as a reasonably accessible policy narrative makes the anti-commons a promising element for reframing the policy discourse. The specter of overly fragmented usage rights and the anti-commons is particularly relevant to the IP discourse for digital artifacts.⁴¹ For novel information and communication technologies interdependence is not a collateral but a central design objective.⁴² The utility of the Internet hinges upon its ability to interconnect very diverse networks. Interoperability is imperative and control over pivotal standard

³⁸ Nelson/Merges, in a seminal contribution introduce the concept of cumulative systems technologies and discuss the problematic nature of broad patent scope in this context. See Merges/Nelson, 1990. In a later work Mazzoleni/Nelson put the current belief in the IP-innovation linkage into historic perspective and point at the long tradition of economic scholarship wary to support excessive IP protection. They also find that "the swing in the climate towards such an endorsement is specially puzzling in the light of the empirical research that has been done on the efficacy of patent protection". See Mazzoleni/Nelson, 1998, p. 274.

³⁹ See Lerner, 2002. Empirical evidence backs these claims. Patent litigation in the US has risen tenfold between 1978 and 1999 with the bulk of the increase in the 90s (Lanjouw/Schankerman, 2001, p. 3);

⁴⁰ For an elaboration from an economic perspective see Parisi et al., 2000; for a legal perspective see Heller, 1998.

⁴¹ See Depoorter/Parisi, 2001 for anticommons and copyright issues; Cohen/Lemley, 2001 for an analysis of the software sector see.

⁴² See Merges, 2000.

technologies can confer significant gate-keeping powers suggesting particular caution when it comes to creating and allocating exclusive entitlements.⁴³

b) Adopting innovations

When moving from innovation *production* to models that focus on innovation *diffusion* and *use*, additional doubts on the social efficiency of ever stronger IP protection emerges. The conceptual switch from property to ‘temporary monopoly rights’ already points the way: the welfare reducing monopoly effect of exclusive property rights has been a staple of economic thinking on intellectual property. Creating exclusive rights might be ex-ante conducive to generating innovations under the qualifications discussed above. But it comes with the ex-post problem of monopoly power. Theoretical models that incorporate both effects have been around for a long time.⁴⁴ They corroborate the finding that intellectual property rights need to be carefully calibrated rather than continuously expanded, in order to generate innovation and ensure its transmission into productivity advances through widespread diffusion. These insights have also been strengthened through an influential strand of thinking in growth theory. Theories on innovation systems and endogenous growth emphasize diffusion and adoption of innovations as drivers of growth and thus posit access and spill-over issues at the center of the argument.⁴⁵ Despite constituting a central component of the utilitarian argumentation on IP, the trade-off between exclusive control and access is rarely acknowledged. Where access issues are raised they tend to be defended on equity and fairness grounds. This is very legitimate as I will address later. But this sole focus on distributive aspects fails to enlist support from these key insights about efficiency that can directly take on conventional utilitarian objections. Access not only matters on fairness grounds, but also on efficiency grounds. This is important. It prevents the false segregation of the policy discourse into efficiency and distributive issues. This separation usually demotes access arguments to an emotive fairness issue to be considered only as an ex-post add-on and only where dramatic consequences linger. Refined theoretical models show that this is a false dichotomy. The aims of distributive justice and utilitarian efficiency converge. In utilitarian terms, balancing IP rather than just strengthening it, is not only relevant to ensuring a justifiable distribution of the innovation cake, but it is also central to the utilitarian paradigm that we generate the biggest cake possible in the first place.

c) Innovation use in the digital environment

The debate on intellectual property for digital artifacts exemplifies this disconnect particularly well. The advent of digital technologies is usually understood to foster piracy and erode the incentive system for innovation, thus evoking calls for *reinstating* protection. However, this is only half of the story, when considering the full utilitarian argumentation: The advent of digital

⁴³ On Internet design principles see Lessig, 1999a; McTaggart, 1999, chapter 7; for a discussion of open and closed systems and their implications for competition and innovation see Carlton/Gertner, 2002.

⁴⁴ See Nordhaus, 1969; specifically with regard to information markets see for example Arrow, 1962.

⁴⁵ See Romer, 1990; Freeman, 1995.

technologies lowers the reproduction costs of a digital artifact to almost zero, thereby effectively turning it into a non-rivalrous good. Eroding variable production require, on social efficiency grounds, to widen access to everyone, thus rolling back monopoly rights. In other words, the costs of exclusive control in terms of foregone benefits to consumers, which cannot afford to buy at the monopoly price, are rising. This point is almost never considered in policy debates. Taking it into account, it is ex-ante far from clear, whether the innovation or distribution effect weighs more and thus whether digital copying capabilities should lead to a strengthening or weakening of intellectual property protection. This is a somewhat complex but very important point. An analogy might illustrate the situation: Let us assume that a new technology arrives that makes it possible to clone toothbrushes or bicycles at basically no cost. Everyone can take their bicycle, utter a magic saying and another identical bicycle materializes. From a utilitarian perspective, what would be the policy implications? One consideration is that we need to make sure that bicycle producers still have an incentive to innovate and improve bicycles and produce new models. But at the same time these magical cloning capabilities offer the marvelous opportunity to supply the entire world with bicycles and toothbrushes at basically no costs. To put it more bluntly, from a social efficiency perspective cloning and this is what digital reproduction of all information artifacts is all about, represents technological progress in its purest form. It offers a 'free lunch for humankind', the opportunity to proliferate information goods without consuming extra resources.

On sum, should we seek to strengthen monopoly control or reduce it as to allow for more cloning and wider distribution? At the very least, the case for stronger monopoly rights appears unclear on efficiency grounds, without even considering distributive justice arguments.

d) IP to secure value-added services?

Advocates of stronger property rights usually fail to consider this distribution part of the efficiency argument. If they take it on at all, they usually introduce the pragmatic ad-hoc argument that cloning alone does not mean utility. According to this view, the purchase of the clone-able product comes with a number of additional services, such as distribution, support, training etc. that make it useful in the first place.

Consider this quote from a recent study commissioned by a software producer advocacy group:

"Q. Isn't there an economic benefit from pirated software?"

A. Yes. There is always an economic benefit from something that is "free." However there are also often hidden costs. It might be nice if gasoline was free, but not if you had to drive to the tanker yourself, store a year's supply in your garage, and do all the repair and maintenance that you might have gotten done at a local gas station."⁴⁶

⁴⁶ IDC, 2003, p. 24.

But what does this argument actually say? The incidence of required ancillary services (or in economic terms 'complements') does not diminish the social utility of cloning. On the contrary, cloning boosts the demand for these very complimentary services or products. It creates new markets. If bicycles can be cloned but bicycle lights and repair services cannot, these markets are going to flourish and scarce resources are not wasted on monopoly rents of something that could be obtained for free, but freed up for value-creating services such as repair-shops and bicycle light industries.⁴⁷ The incidence of compliments can help recoup investment costs, thus retaining incentives for investment even in the context of novel cloning technologies.⁴⁸

This rather lengthy exploration is important, since it describes the reality in many digital markets rather well. The incidence of ancillary services is high. According to industry figures, the global ICT services market has reached almost the same size as the hardware and software markets taken together (420 billion USD out of an overall market volume of one trillion USD).⁴⁹ As will be discussed later in detail, an entire service industry has emerged around what are essentially free or open source software products, demonstrating the viability of a service based business model.⁵⁰ Given these facts, it is very questionable whether stronger property rights are indispensable to safeguard innovation in the software industry.

e) Macro-level models

Moving from partial models to macro-economic frameworks that model investment, innovation and trade in two or more country settings the implications for IP policies are even less clear. The question about how strong or weak monopoly rights should be is expanded to the question how strong or weak rights in one country should be made *in relation* to other jurisdictions. Typically, the findings in a large body of literature are not very robust and changes in assumption and model specifications tend to change recommendations quite dramatically.⁵¹ This inconclusiveness of the theoretical literature stands in stark contrast to the commonsensical certainty and assertiveness with which claims about long-term beneficial effects from stronger IP protection for developing countries are presented. The theoretical literature does not lend support to this strong claim. A large number of influential theoretical models on innovation, trade and investment suggest that stronger intellectual property rights

⁴⁷ Conceptual refinements also point to the possibility that distribution systems based on individual distributed copying capabilities can be more efficient than distribution qua a monopoly producers. The reason for this are superior, transaction costs saving self-selection and aggregation of potential buyers in communities of practices with low cost sharing arrangements(see Bakos et al., 1999).

⁴⁸ A variety of sophisticated theoretical refinements also chip away on this assumption that strong IP is necessary to appropriate gains from innovation in the digital environment. Boldrin/Levine, 2002 for example reconceptualise up-front investment costs as so called *competition with indivisibilities* that still provides for investment incentives, since the value of the first copy rises.

⁴⁹ See IDC, 2003, p. 5.

⁵⁰ See section V.B.

⁵¹ For an overview of studies see Kumar, 2002.

will rather hurt than benefit developing countries and often imply considerable resource transfers from poor to rich economies.⁵²

2. Empirical evidence

With a theoretical literature on the overall developmental effects of IP mired in disagreement, guidance might come from empirical investigations. Unfortunately contrary to received wisdom, the picture is not clear either.

Many indicators related to R&D, innovation, trade and development are positively correlated with stronger intellectual property protection.⁵³ On closer inspection however, this consensus breaks down for several reasons. Results are often found to be highly contingent. Borensztein et al., for example, find that FDI can be responsible for technology transfer, but only where capital and technology stock are relatively high already.⁵⁴ Kumar arrives at a similar conclusion.⁵⁵ Irrespective of these counterfactual, it would not be possible to infer from positive correlations that stronger IP would lead to economic development. At a methodological level, the issue of 'causality vs. correlation' and 'asymmetries in measurement' raise concerns. Crude regression analyses that detect a correlation between strong IP and development indicators across countries appear unconvincing since correlation does not equal causality. And even assuming that causality exists, it might as well run the other way, since a higher level of development might bring about improvements in governance capabilities with the byproduct to modernize policies and institute an IP system.

a) Visualization vs. change

Some more differentiated regressions seek to prove a causal link between IP and innovation proxies, such as technology imports, licensing or patent registrations.⁵⁶ However, these studies face a methodological problem that is to my knowledge not considered in the literature: asymmetric measurement. It is only with the introduction of exclusive ownership rights that diffusion and trade of innovations are made *visible* in an economic accounting sense. It is not really surprising that the introduction of exclusive ownership increases the need to obtain formal licenses, or to purchase technologies that could previously be obtained for free through informal channels, below the radar screen of the national accounting system. Much of the suggested rise in technology transfer could eventually only be a shift from informal, unmeasured imitation and adoption to formal, accounted acquisition. This is speculative, but a plausible working hypothesis in the absence of evidence to the contrary. To the extent that this is a true assumption, the increases in licensing and technology import

⁵² See for example Helpman, 1993; Grossman/Lai, 2002; Deardorff, 1992; Glass/Saggi, 2002.

⁵³ See Kanwar/Evenson, 2001.

⁵⁴ See Borensztein et al., 1998.

⁵⁵ See Kumar, 1996.

⁵⁶ See Worldbank, 2002a, chapter 5 for an example of listing trade effects without addressing the substitution issue.

simply represent resource transfers from developing to developed countries, an important point from a distributive justice perspective.

b) Qualitative case evidence

These concerns make macro-structural regression analysis a bad tool for examining the relationship between intellectual property and development. More detailed qualitative assessments have been conducted in a variety of formats. A historical analysis of commonalities in the development trajectories of countries is one possible method. Related studies show that early stages of development are usually associated with weak intellectual property protection that allow local industries to exploit existing technological innovations and break into new markets.⁵⁷ It is far from clear however, whether these historical findings hold for advanced stages of development or how robust they are in a globalized economic system. Detailed investigations of innovation-imitation cycles in different industries and interviews with business executives also yield mixed results. A comprehensive survey of patenting in the US manufacturing sector finds that intellectual property is regarded as quite insignificant relative to other strategies for recouping investment such as lead time, secrecy, or complimentary marketing. Furthermore, the study concludes that patenting is often motivated by defensive reasons such as building a patent pool to force rivals with complimentary patents into bargaining.⁵⁸ Interviews with business representatives seem to corroborate that IP protection is an important factor for *some* types of foreign direct investment in *some* industries.⁵⁹ But these results need to be treated carefully, given that interviewees are usually IP lawyers within a corporation who are unlikely to undermine their reason for existence, or business leaders, for whom stronger IP protection translates into additional revenues. In fact this political economy consideration can be taken further. Irrespective of the real importance of IP for foreign investment decisions, alluding to its relevance can provide leverage over countries that are competing for investments but are reluctant to grant protection for the investor's products. All other things equal, FDI can thus be located strategically to reward the countries that fall-in line and provide additional revenue sources for the investor through stronger IP. On the surface, this leads to strong empirical linkages between IP and foreign direct investment, even when controlling for all other factors. But in essence it is IP as quasi-subsidy that generates additional revenue, rather than as location prerequisite to avoid theft of secrets linked to the production process. To my knowledge these issues are not discussed in the related literature.

⁵⁷ See Chang, 2001.

⁵⁸ See Cohen/Nelson, 2000.

⁵⁹ See Mansfield, 1994.

C. From evidence to policy

Where does this all leave us with regard to the policy guidance on intellectual property to be derived from utilitarian reasoning?

As it turns out, the aura of truism that surrounds the claim that stronger intellectual property rights further innovation and development is misguided. It rests upon a very selective reading of the theoretical and empirical literature that ignores a large body of evidence to the contrary, while brushing off methodological and empirical problems in the body of work it enrolls for support. The image of the lone inventor in her garage motivated by the prospects of future gains provides for a suggestive metaphor, but does not adequately describe an interdependent innovation process, where overburdening exclusive control rights stifle rather than promote innovative activity.

Likewise, the commonsensical relation between innovation and productivity is too simplistic. It masks important issues of innovation diffusion and access that are central to maximizing the social gains from innovative activity. And again, overly strong intellectual property rights can hamper rather than help these diffusion efforts.

Finally, the strong association between IP, technology transfer and economic modernization is very tenuous, leading an IP proponent and Worldbank economist to the conclusion that: *“it is impossible to guarantee as a matter of logic or fact that stronger IPRs [intellectual property rights] will generate economic gains for all countries. Indeed, the implementation of stronger IPRs alone could make some nations worse off.”*⁶⁰

In sum, the empirical and theoretical evidence does not support the strong utilitarian claims about IP that are usually advanced in the policy discourse. It calls for careful calibration and differentiation of IP rules within and across countries, leaving the door open for qualified experiments with weaker protection rules and lower standards for developing countries.

As the literature review has also shown the negative effects of excessive protection can be expected to be of particular salience in the digital environment, where many products exhibit non-rival properties and interoperability is key. Ultimately the utilitarian choice of IP rules depends on the status quo and the technological and legal dynamics that the advent of digital technologies has set in motion.

The overall picture to emerge is one of a wider potential scope for IP rule-making, far more inviting to experiments, in particular with regard to digital technologies and developing country contexts. And given the inconclusiveness and contingency of moral and utilitarian claims considered so far, arguments of distributive justice could assume a greater role in shaping the choice of substantive rules one way or the other.

Dissecting the IP discourse also provided us with a more differentiated vocabulary that has replaced property and piracy with temporary monopoly and adoption or diffusion, and

⁶⁰ Maskus, 2000, p. 236.

introduced some conceptual caveats such as anti-commons or cumulative innovation to be placed alongside the misguided imagery of the garage-inventor or lone genius.

We can now put this more differentiated and less myopic toolbox to use and examine some specific IP arrangements and trends in the digital economy from a global justice point of view.

IV. Digital artifacts – the dawn of a new enclosure?

In the following I will outline some major legal and technical trends that restructure the allocation of entitlements related to digital artifacts.

I will assess these shifts along two somewhat stylized dimensions: *scope* and *depth*. Scope refers to the different types of artifacts to which private claims can be attached and depth denotes the strength of control, the range of functionalities of a given claimable intellectual artifact that can be subjected to private controls.

Given the scope of this paper and the complexity and diversity of issues at hand, the discussion can only be indicative. I will simply flag some major developments and focus on drawing out some implications for distributive justice, a perspective rarely adopted in the literature.

A. Deepening entitlements

Reports of online file-sharing of songs and movies on an epic scale have for quite some time dominated the news coverage about digital reproduction technologies. These reports not only evoke a sense of urgency and regulatory neglect, but also leave no doubt as to who benefits from these technology-dictated changes: the computer savvy end-user.

However, this dominant storyline distracts attention from a number of concurrent technological and legal developments that together rework effective controls over digital content in far more profound ways - and with diametrically opposite results.

1. Technological developments: Digital Rights Management

The advent of soft- and hardware architectures for digital rights management (DRM) is at the heart of the pertinent technological developments in this regard. DRM is made possible through effectively unbreakable digital encryption technologies that protect access to digital content and can also be used to authenticate users. These capabilities can be embedded into software and hardware modules, which can be interlinked to form very sophisticated usage verification and content control systems. Such systems often entail information exchange and verification processes between multiple networked resources. They make it possible to implement highly differentiated information access and use policies stipulated by the content

originator.⁶¹ In simplistic terms, advanced DRM systems offer the content originator not only the opportunity to determine who can decrypt and gain access to digital items, but also what can be done with these items, in which contexts it can be done, how often or how long. DRM systems not only assign these rights but can also change or withdraw them.⁶² Systems already in use make it possible to allow viewing of documents, but prevent printing or copying⁶³. They can specify that an audio file can only be downloaded to a limited number of computers and some portable devices⁶⁴, that copies expire or can only be viewed x-times, that they can be used only with equipment in a certain geographical region, but not another.⁶⁵ What is on the horizon resembles somewhat Rifkin's dystopic vision of an age of hypercapitalism, where everything will be a paid-for experience and leasing replaces ownership.⁶⁶

a) Efficiency and expectations of fairness and justice

Now as far-reaching and startling as these technologies might be, they might be defended on the basis that they simply provide tools to enforce and thus make possible in the first place highly specified transactions. From an economic efficiency perspective DRM could be viewed as the ideal tool to approximate ideal markets and specify the most sophisticated ownership rights.⁶⁷ In other words, DRM would simply appear as a heaven's sent mechanism to perfect ownership. In fact, this is the argument most frequently advanced in this context.⁶⁸ The tenuousness of these claims should already be obvious in the light of the general discussion on ownership, fairness and efficiency and its relation to property in the digital environment as outlined in earlier sections. Strengthening exclusive control in the context of interdependent creative activity might neither promote individual freedoms nor social efficiency. But what it definitely entails is a distributive effect by shifting specific entitlements from the user to the content originator.⁶⁹

Two analogies might help to illustrate the enormity of the distributive changes on the horizon. First, let us assume that a DRM system might become feasible for tangible objects, say

⁶¹ For the path-breaking account of DRM see Stefik, 1997; for an introduction see Iannella 2001.

⁶² See Erickson, 2003.

⁶³ E.g. the popular Adobe Portable Document Format (PDF) (www.adobe.com).

⁶⁴ E.g. the music downloading service 'iTunes Music Store' by Apple Computers (www.apple.com/music).

⁶⁵ E.g. the regional code system for DVD technologies (german.about.com/library/bldvdcodes.htm).

⁶⁶ See Rifkin, 2000.

⁶⁷ Merges, 1997 discusses these issues in the area of e-commerce (Merges, 1997).

⁶⁸ See Boyle, 2000; Cohen, 2000.

⁶⁹ *Ceteris paribus*, this distributive effect would persist even if we ignored the collateral effects on social efficiency and assumed that the introduction of DRM actually resulted in an efficiency maximum. This point touches upon a central insight of neo-classical welfare economics, the policy implications of which are rarely explicitly considered: even a policy that enables to move to the most efficient resource allocation (i.e. the greatest cake, the so called Pareto maximum) is rarely itself Pareto-efficient, i.e. putting in place the conditions to bake the biggest cake might typically leave some worse off compared to the initial endowments of goods or rights (see for example: Aidt, 2000). In policy debates these distributional concerns are typically brushed aside and the move towards more efficiency (the bigger cake) is justified with the claim that a hypothetical ideal redistribution would make it possible to compensate the losers and make everyone better off.

clothes.⁷⁰ Imagine that a clothing retailer would find it possible to stipulate that a jacket self-destructs after six months, or that it can only be worn for a total of twenty-five hours; that a shirt can only be worn in Europe and that it cannot be worn by anyone else. Would this be considered to be a mere refinement of the garment vendor's property rights? Maybe. But one cannot help a certain unease that a fundamental reallocation of what were once settled entitlements is underway and that this shift comes with significant distributional effects that cannot be simply brushed aside as a refinement of property rights. Or consider another, this time real-world, scenario: the discussion about so called 'terminator seeds'. Advanced biotechnology methods make it possible to restrain the germination capabilities of seeds and effectively switch off their innate capacity to procreate.⁷¹ The application is obvious. It allows biotechnology companies to create continuous market demand for their advanced seed products, by curtailing the ability of farmers to keep on generating new seedlings generation by generation. The moral outcry that accompanies the use of these terminator genes in seed products is enormous.⁷² Partly it revolves around the claim of irresponsible tampering with nature with unforeseeable ecological consequences. But to a great extent it is also fuelled by the feeling that the use of terminator seeds constitute an unjustified appropriation of entitlements and resources on the part of biotechnology companies on an epic scale. In many ways, terminator seeds are the equivalent to DRM architectures. They are *biological rights management*. The point I try to make is not that the status quo should always be viewed as superior, but that the introduction of all these technologies cannot be merely discussed in terms of refinement of ownership. Just as with terminator seeds, the advent of DRM portends dramatic changes in the allocation of effective usage powers associated with a specific artifact, intellectual or otherwise. The expansion of control for the producer goes hand in hand with the erosion of well-established rights for subsequent owners and users. These distributional implications need to be recognized as such and be considered in the discussion on the policy framework for DRM.⁷³

⁷⁰ The hypothetical futuristic technical implementation might consist of a built in microchip that interacts with 'smart fibres in the garment and can communicate with external monitoring systems.

⁷¹ For an introduction to the technology see Colorado State University, no date.

⁷² See for example CNN: "Terminator Victory a Small Step in a Long War", October 7, 1999.

⁷³ Both digital copying and DRM might be considered as disrupting settled expectations and shifting effective powers over an artifact. But crucial differences characterize the nature of these respective disruptions with important implications for the distributive justice dimension implicated in both cases. The earlier discussion on property in the digital realm should help to understand these differences. Digital copying suspends scarcity, while DRM re-introduces an artificial version of it. Duplication is not equivalent to seizure. It does not reduce the direct utility and physical disposition of the artifact enjoyed by the original owner. But DRM directly seizes positive functionalities from the user and reduces the utility derived from it. Thus, digital copying is a positive sum extension of functionalities attached to a resource, while DRM is a zero-sum transfer or even negative-sum reduction of the same. Or in other words, digital copying expands the freedom to utilize, while DRM expands the freedom to restrict. Or in close relation to the discussion at the beginning, digital copying represents a move towards a non-rivalrous commons cornucopia, while DRM creates new entitlements to restrict and thus makes more likely a move towards the anti-commons fragmentation scenario. Given these very different characteristics, the distributional shifts involved cannot be viewed as equivalent from a distributive justice perspective. All other equal, positive-sum copying raises less fairness concerns than zero or negative-sum rights DRM.

Re-framing the discourse on DRM by linking it closely to these analogies helps to bring out these essentially political and distributive aspects that require careful evaluation, when creating the regulatory framework for deploying DRM.

b) The regulatory response

The respective governance structures in the making however, show little regard for these concerns. Updated legislation in the key standard-setting fora usually recognize digital rights management as an important tool in the information economy and grant it special legal protections by outlawing the circumvention of access control technologies. For the US, these provisions have been enacted via the Digital Millennium Copyright Act (DMCA) of 1998.⁷⁴ The European Union has included them in their Directive on Copyright and Related Rights in the Information Society (Directive) of 2001⁷⁵ and the transformation towards an international IP norm is expedited by respective provisions in the World Intellectual Property Organization Copyright Treaty, to which already more than thirty countries have signed up.⁷⁶ Proponents of DRM note that these rule-systems do not represent a full-scale shift of powers but respect some well-established user's rights by providing for specific legitimate fair use exemptions such as copying for educational purposes or creating a private safety back-up. But these claims need to be substantially qualified.

The devil is in the detail and the implementation frameworks that serve as role models bode ill for the future of said user rights. The US, for example, allows for the circumvention of access controls for some fair use purposes but at the same time cracks down determinedly on the circulation of circumvention technologies.⁷⁷ Put differently, cutting the wire for emergency purposes is allowed, but the sale of wire cutters is banned, turning legitimate self-help into a remote theoretical possibility, rather than practical option. The EU, on the other hand, has outlawed circumvention, but mandates right holders to build fair use exemptions into their rights management systems.⁷⁸ Again, this is rather wishful thinking, since it is not coupled with clear enforcement mechanisms. And more generally, this approach militates against the consensual perception of what is technologically feasible. Fair use by technological design is not regarded as realistic, since DRM systems cannot replace human judgment to determine the incidence of fair use. These systems lack the capabilities to undertake the context specific evaluation and weighing of a variety of criteria, required to determine the incidence of fair use.⁷⁹

⁷⁴ See Samuelson, 2003.

⁷⁵ See Dusolier, 2003.

⁷⁶ Respective articles in WIPO Copyright Treaty, Articles 11 and 12, are at <http://www.wipo.int/treaties/ip/wct/index.html>; a list of countries party to the treaty is at <http://www.wipo.int/treaties/ip/wct/index.html>.

⁷⁷ See Samuelson, 2003, Lessig, 2003.

⁷⁸ See Dusolier, 2003.

⁷⁹ See Erickson, 2003; Samuelson, 2003.

2. *Emerging regulatory outpacing: from public to private ordering*

The difficulties of recognizing copyright principles such as fair use in the DRM environment are far outpaced by a set of more fundamental legal challenges. Control over digital artifacts and their use is increasingly expanded via means of private contracting. Technological rights management is advanced in tandem with legal rights management. Sales are converted into leases and contracts specify in great detail what type, frequency and context of uses are legitimate. Fair use rights might have to be honored on the basis of copyright law, but can they be contracted away in private agreements? This fundamental clash between freedom of contract and social protections, between private and public ordering is highly complex, highly salient in the digital environment and far from resolved. However, close observers voice concerns over tendencies in current legislative and jurisdictional activities to grant exceptional leeway for private ordering at the expense of established information rights.⁸⁰

The problems with these developments from a distributional justice perspective are similar but somewhat more subtle than what has been discussed for DRM. Like DRM, private contracting widens the scope for exclusive control. But unlike DRM it does not pre-allocate it to the originator but simply brings additional control rights within the realm of negotiations between contract partners.

The eventual distributive effect thus hinges upon the distribution of bargaining powers. It would be unsatisfactory however to stop the analysis at this point and presume a level playing field or simply by call the evidence inconclusive. Several considerations suggest the incidence of asymmetric bargaining powers. First, the economic properties of information and digital information in particular do allow for some inferences on the likely concentration of bargaining powers. Pervasive network effects, ubiquitous economies of scale, scope and position generate markets for digital artifacts that are far from competitive.⁸¹ Second IP legislation works to the same effect, since it explicitly seeks to stave off competition and confer temporary monopoly rights for digital artifacts.⁸² Third, novel digital tools support these contracting practices by automating the presentation of licensing rules and expression of consent. So called shrink-wrap and click-wrap licenses make access to digital products conditional upon clicking away a usage agreement presented on the screen.⁸³

The emerging picture is one of take-it-or-leave-it contracts with very specific and strict licensing agreements without much alternative choices for the information users.⁸⁴

⁸⁰ See Boyle, 2000; Benkler, 2000; Cohen, 1998; for an inter-generational justice perspective see Nunziato, 2001.

⁸¹ For an accessible overview see Shapiro/Varian, 1998.

⁸² This indicates a shifting role for IP policies. They might be superseded by private contracting with regard to their effects on consumers, but at the same time ensure the temporary monopoly power that makes the imposition of restrictive contract terms upon consumers possible in the first place.

⁸³ The legal standing of these agreements is not without controversy but has been confirmed in a number of rulings (see Samuelson/Opshal, 1999).

⁸⁴ For an elaborate critique of the alleged superiority of private ordering in cyberspace see Merges, 1997.

The media focus on recreational music file-sharing unfortunately overshadows the implications of this sea change. A sweeping reworking of fundamental information rights is on the doorstep with implications for freedom of expression⁸⁵, innovation, creative activity and not least distributive justice.

The scale of these changes driven by private contracting and expansive technological control capabilities has been likened by some legal observers of the precedence-setting US jurisdiction to the doctrinal legal clashes over private and public ordering in the early 20th century. Back then, the controversy surrounded the New Deal and its introduction of basic social protections against excesses of private contracting. This debate laid the foundations for the social market economy.⁸⁶ Today, prominent legal observers call for a reorientation of intellectual property law towards information rights as safeguards against the excesses of private contracting in an information economy. Unfortunately, these warnings by a small band of highly specialized technology law experts mainly in the US has yet to make a wider mark on the policy discourse.⁸⁷

B. Broadening entitlements

The ascent of DRM and private ordering not only strengthens the degree of control over a digital artifact, but also the range of artifacts to which such entitlements can be attached. Admittedly, this is as to yet rather uncharted territory, since it is not yet clear, how public and private orderings will interact. But in the following I will enlist a number of other trends that work to the same effect and have greatly expanded the scope of protectable materials.

1. The breakdown of the idea/expression dichotomy

As mentioned earlier, the distinction between an unprotectable abstract idea and its protectable expression (in copyright law), or technical implementation (in patent law), is a central tenet in IP rule-systems. It reflects moral reservations about the origins and appropriability of human ingenuity and, on a more practical level, about overly broad claims that could stifle the desirable 'inventing around' by competing innovators. The nature of digital technologies poses a serious problem for this distinction.⁸⁸ Software is both speech and technical implementation. On the one hand, it serves as a language with strictly defined grammar and vocabulary to formulate and express complex ideas in a very exact form. On the other hand, it serves as a set of machine-executable orders that whisk around electrons in electronic circuits. What looks like irrelevant ontological hairsplitting has great implications for intellectual property rule-making. It all but precipitates the breakdown of the idea/expression

⁸⁵ On related freedom of expression issues see Cohen, 2001.

⁸⁶ See Cohen, 1998.

⁸⁷ For a European contribution see Bechthold, 2002.

⁸⁸ For the following see Stern, 1999; Newman, 1999; Merges, 1999.

dichotomy. There are no ideas prior to language. Language, including computer language is the most abstract way of expressing them. At the same time software renders an immediate technical effect. It is thus a hybrid, consisting of description *and* implementation. As a consequence, the question whether software should be patentable assumes a significance that goes well beyond the immediate software issue. It is of crucial importance to the fundamental scope of intellectual property protection.

Emerging legal frameworks and early case law are rather oblivious to these wider consequences. Courts and policymakers treat the patentability of software as a simple and logical extension of established rules to a novel group of artifacts, paving the way for a dramatic reworking of IP principles and thus a significant extension of intellectual property protection. Following a landmark decision in 1998, the US explicitly recognizes the patentability of software based business methods.⁸⁹ This has ushered in a tsunami of patents for digitally encoded business applications that often do not amount to more than trivial business ideas. By 2000, 40000 software patent had been issues in the US⁹⁰, some notorious examples include:⁹¹

- Attention brokerage - a method of rewarding web surfers for paying attention to online adds;
- Universal shopping cart - method to make on-line purchases at several website and be billed only at one location;
- Hyperlinking – the most essential building bloc of the World Wide Web. A telecommunications company claims to hold a patent on referencing information across different sources online and currently tries to enforce it vis-à-vis some major Internet service providers;⁹²
- Downloading digital music files - method for downloading digital audio files from the Internet for money. Various online music providers are paying fees to patent holder.
- Searching and indexing the WWW: a company claims to own 38 fundamental patents on widely used web searching techniques and has announced to enforce them in the near future.

Software patents are on the way of becoming a global norm in policy making. In 2002 the European Union proposed a policy directive that recognizes them.⁹³ Most interestingly the EU sought to quell concerns over this decision by pointing at the WTO/TRIPS agreement and the

⁸⁹ See Stern, no date.

⁹⁰ See Cohen/Lemley, 2000.

⁹¹ See Shulman, 2000.

⁹² Reuters: "Linking Patent Goes to Court", 7.2. 02.

⁹³ The concurrent attempt to draw a line between abstract ideas and implementation and thus exclude basic business method patents is believed to be ineffective given the hybrid nature of software outlined earlier.

obligations to provide for patent protection of software that it allegedly includes.⁹⁴ This claim is controversial. But it indicates to what extent international rule-systems are already believed to accommodate this ontological switch from software as expression to patentable implementation and thus pave the way for what some have termed a 'digital land grab'.⁹⁵

2. Nuisance or trespass? The stricter interpretation of IP violations

A related ontological switch with far-reaching consequences is under way with regard to the concept of information. Here, a classification as intangible speech is increasingly giving way to a view of information as tangible property, when stored on a computer. The strong influence of the property paradigm on this conceptual transformation towards physicality is evident. Again, this switch from intangible to tangible artifact is very important in legal terms. Assuming physicality, acts of infringement can be treated as trespass, rather than nuisance. And the threshold to be found guilty of trespass is lower than for nuisance, expanding the definition of infringement to what were previously considered legitimate acts.⁹⁶

3. Lowering the threshold of originality/invention

Moving from rule-making and adjudication to rule-implementation, a number of organizational characteristics further the expansion of property regimes in the digital arena.

Resource constraints are one factor. Patent-granting authorities are generally under-resourced and lack sufficient expertise in examining patents in the relatively new and rapidly-evolving field of digital technologies. As a consequence, the requirement of an 'inventive step' that is not trivial to knowledgeable people in the respective industry can rarely be examined thoroughly. This has been found to be a particular problem with regard to patents for digital technologies. The situation is exacerbated by a self-perception of patent authorities as certification service providers to the industry rather than purveyors of the public good.⁹⁷ Often times organizational characteristics encourage the same attitude: individual examiners are evaluated on the quantity of applications they process and patent fees make up part of the agency's income.

The results of this incentive systems are worrying. For the US, statistics show that more than 60% of computer related patents filed between 1976 and 2001 do not contain citations of prior related art. Given the highly interdependent nature of innovation in this environment this is bizarre and an indicator for the low quality of patents granted in this area.⁹⁸

⁹⁴ For an up-to-date overview of the debate see the information repository maintained by the Foundation for a Free Information Infrastructure (swpat.ffii.org/index.en.html).

⁹⁵ Jenkins, 2000.

⁹⁶ Case law in the US is at the forefront of these developments. See Radin, 2002.

⁹⁷ See Kahin, 2002; Merges, 1999.

⁹⁸ See Aharonian, 2002.

4. Sweat-of-the-brow protection

The dilution of the inventive step requirement culminates in emerging IP rulemaking that recognizes significant investment expenditures for producing digital artifacts as sufficient condition for granting protection. This so called sweat-of-the-brow principle that was long regarded as insufficient for gaining protection, has been explicitly endorsed by the European Union in its database directive of 1996. This provision has created a stand-alone protection right in collections of factual data.⁹⁹ An innovative aspect, the central rationale for IP protection, is no longer required and mere listings of factual data qualify for exclusive control.¹⁰⁰ It is currently unclear, how fast this expansion of IP will take hold internationally. For the time being, the pivotal US legislature has chosen not to follow the European example, prodded by strong resistance in the academic community. But this might change. The provision still looms large, periodically re-appears on the policy agenda and has many supporters in industry.¹⁰¹ Moreover, “progress towards a possible international instrument on the protection of databases” features prominently in the WIPO work programme.¹⁰²

This development marks the ‘logical’ end-point when the property paradigm is applied to IP rule-making: In this view, property deserves protection as such, irrespective of qualifying conditions such as innovative step or originality. The bizarre consequences of this logical extension illustrate how misguided the application of the property paradigm really is for thinking about intellectual artifacts. All of a sudden the very prospects of nonrivalrous properties triggers the fencing off and the engineering of artificial scarcity. The chance for a free lunch, the possibility of a cornucopia of duplicate-able resources is abandoned in favor of exclusive controls.

5. The privatisation of information services

The European Union database rules also point to another problematic development. The provision was partly motivated by the desire to unlock novel public revenue sources through boosting the market value of information created by the public sector. This strategy is embedded into a wider reform process. Public bureaucracies all over the world have signed up to a lean government ideal that confines the governmental mandate to essential functions services and keeps the interference with private sector service provision to the minimum. Furthermore, what remains under collective control ought to be administered on new public management principles that suggest to boost efficiency through the use of market mechanisms wherever possible. These normative predispositions in tandem with severe

⁹⁹ On a technical note it should be emphasized that databases were not without protection prior to these novel rules. Provided a minimum level of originality the particular organization and presentation of data qualifies for regular copyright protection.

¹⁰⁰ For a discussion and implication see David, 2000; Maurer et al., 2001; Hugenholtz, 2001.

¹⁰¹ See Hughes, 2002.

¹⁰² See WIPO: Digital Agenda, announced in 1999 and subsequently approved by member states (ecommerce.wipo.int/agenda/index.html#1).

budget pressures are not very conducive to open access information initiatives. What were once public information services are privatized, operated on for-profit terms, or simply dismantled.¹⁰³ This roll back of open access to information appears at a point in time when the nonrivalrousness of digital artifact would, from a social efficiency perspective, require the opposite: to ensure the widest possible accessibility of such information items.¹⁰⁴

Commercialization and profit-center thinking have also engulfed much of university research with the Bayh Dole Act (1980) in the US laying the foundations for granting private control rights over publicly funded research, and Europe following suite with related initiatives.

6. Summary

Contrary to popular belief, the advent of the digital economy and the accompanying reworking of IP rules do not portend the erosion of private controls, but rather the opposite. A digital land grab appears underway that some observers have likened to a 'new enclosure movement' in analogy to the appropriation of private land to the US.¹⁰⁵

Emerging patent and copyright rules expand protection to abstract ideas and factual data. In tandem with organizational incentives, they dilute or even abolish the innovative step requirements and roll back publicly funded information provision. They define information as tangible and find infringement, where there was previously speech. In sum, they suspend some of the most fundamental principles of IP rule-making. And they suspend these rules in a way that unfairly skews the fundamental social contract for IP: the granting of a temporary carefully delimited monopoly as incentive for innovative activity for the common good. In view of these developments even a prominent IP proponent arrives at the conclusion that "in important respects the American regime has become overly protectionist by almost any utilitarian standard."¹⁰⁶

This effect is exacerbated by another possibly even more significant development: public ordering of the information society takes more and more a backseat to private ordering. What constituted at least theoretical leverage for some collective rules to spread the benefits of the information economy somewhat more equitably, is ceded to private market powers. This is made possible through private contracting and the advent of private enforcement through digital rights management systems in conjunction with legal provisions that amplify rather than carefully delineate these new powers.

¹⁰³ See David, 2000, p. 18-20; and more generally on the new public management approach for handling public sector information in the digital environment see Chadwick/May, 2003. For a concrete example of a public information service being shut down in the US see Jensen, 2003.

¹⁰⁴ Commercialization and profit-center thinking have also engulfed much of university research with the Bayh Dole Act (1980) in the US laying the foundations for granting private control rights over publicly funded research (see Press/Washburn, 2000).

¹⁰⁵ Lessig, 2002.

¹⁰⁶ Maskus, 2000, p. 65.

This trends towards new enclosures stand in stark contrast to the grave doubts about the social benefits related to a further expansion of exclusive control rights over digital artifacts that I discussed earlier.

C. The implications for international justice

I have already flagged some of the general implications for distributive justice while discussing the claims associated with stronger property rights. They can be summarized as follows:

- The predominant view, that an irresolvable trade-off exists between distributive justice and other values such as freedom, equality of opportunity, personality, and innovation is misguided. True, this trade-off might exist between strong exclusive control and distributive justice. But exclusive control, and the property paradigm attached to it, do not promote the values of personality, freedom, or equality to the extent usually claimed. At best, there are better alternatives that do not trade off against distributive justice, at worst the property paradigm is even counterproductive;
- In particular in the context of digital technology limited exclusive control and thus more equal access to digital artifacts is positively interlinked with these other values. The non-rival properties of digital artifacts call for maximum availability from a utilitarian social efficiency perspective. These properties provide for positive-sum distributive improvements, which do not require resource transfers, but simply the cloning of digital artifacts at miniscule costs.
- The cumulative, interdependent nature of innovation in the context of interoperable digital architectures makes limited exclusive control and equitable open access a pre-requisite, not a roadblock for innovation, equality in opportunity and creative activity. Limiting exclusive control mitigates mutual hold-ups (the anticommons) and blocking efforts by first movers with large intellectual property holdings.

The more specific discussion of IP trends in the digital economy has further highlighted distributional concerns. It has shown that, despite the media spotlight on file-sharing, a digital land grab is underway that dramatically expands the scope and depth of exclusive controls. Comparing the control shifts effected by DRM with terminator seeds and a hypothetical DRM system for tangible goods illustrates the scale and moral questionability of the distributive transfers to be expected.

The conclusions from this discussion are twofold: first distributive justice is not only an intrinsic objective in itself, but an important vehicle to promote other values such as innovation, freedom etc. in the digital environment. Second, much of the debate about IP and the extent of exclusive controls is essentially about distributive issues, not the values it

purports to advance. In other words distributional concerns are at the heart of rule-making for the digital age and given current trends large distributional shifts of entitlements are under way.

How do these dynamics play out internationally? I would argue, that the reallocations of control rights underway are particularly problematic from an international distributive justice perspective. What is at the national level a shift of rents and opportunities from users to rights holders becomes a shift from imitating *countries* to rights-holding *countries* at the global level. The distribution of both stocks (IP asset holdings) and flows (new registrations) across countries is highly uneven and even far exceeds other global inequalities such as income distribution. In 1998, for example, OECD countries accounted for 86% of patent applications filed and the US alone earned 54% of worldwide income on royalties and license fees in 1999.¹⁰⁷ This has a number of important implications for distributive justice to be considered in the following.

1. From claims on the present to claims on the future

Where income disparities provide a snapshot of current economic activity, IP ownership is forward looking. IP assets constitute claims on future production, productivity and income. The broader and stronger these entitlements can be designed, the more sweeping these claims on future income will be. As outlined earlier, this is particularly imminent in the digital environment. Extending exclusive controls to factual information or abstract business ideas and strengthening the scope and duration of such controls ensures private ownership of digital architecture, content and even basic ideas of ICT applications in e-commerce etc. And it concentrates these rent extraction opportunities in the hands of the first moving innovators, the highly advanced ICT countries, while precluding other countries from harnessing the non-rivalrousness of digital artifacts. Given the cumulative and systemic nature of ICT innovations, expansive private controls over de-facto standard technologies are particularly precarious. They provide for interface control that can be leveraged into adjacent innovation markets. What's more, they require follow-on inventors, who would like to adopt these standard technologies to local conditions (e.g. through different language interfaces) to seek permission from software owners. This does not preclude local adaptation but makes it susceptible to additional rent-extraction by the rights-holder.

2. Exclusivity and opportunity

The forward-looking orientation of IP is not the only feature that bodes ill for distributive justice. The *exclusivity* feature might even be more important. It makes a mockery of a central

¹⁰⁷ See Human Development Report, 2001.

moral underpinning of the global economic system, the belief that current arrangements and rule-system provide the opportunity for catching up.

It is this basic equality of opportunity, the prospects of reciprocal benefits and a fair chance to close the gap, that ultimately morally legitimates a market-based global economic system. It is far from clear, logically and empirically, whether catching-up is a plausible claim. Many would argue that it is not, that it entails a fallacy of composition and that empirical evidence also suggests to the contrary. The inconclusiveness of this debate notwithstanding, one point seems clear. Exclusive controls, by its very nature of being exclusive, undermine the chance for catching-up by following the example of the first movers. *A second mover cannot do the same without asking the first mover and IP asset holder for permission.* IP explicitly creates monopoly rights and prevents direct competition. In economic terms, IP can be conceived as a *positional resource*.¹⁰⁸ It is constituted not through absolute endowments but relative standing, here temporal privileges. By definition there can be only one first mover. This is not simply an esoteric side-note but a pivotal determinant for the distribution of gains in global production networks. Global value chain analysis amply demonstrates, that the lion's share of profits are realized in those segments of globalized production networks, which defy commodification, i.e. which avoid being pulled into cut-throat, price-based competition that erases profit margins over time.¹⁰⁹ With the deepening integration of global production networks commodification has moved from natural resources and agriculture to industrial production and increasingly services and higher technology production that have long been regarded as immune to remote outsourcing. From the perspective of a policy-maker, moving the national economy up the value chain is individually the best strategy . However, from a global point of view it resembles a *rat-race* that fuels the escalation of commodification at ever higher valued-added stages of the production process. Where China and Malaysia competed on natural resource exports, they now drive down profit margins in semiconductor industries. Where India once faced Mexico in the global apparels market, it is now also competing head on with Ireland on international call center services. How does all this relate to IP? The key to secure stable profits in the context of dynamic commodification is to create exclusive entitlements somewhere along the way. And IP does just that. It equips rights-holders with bottleneck monopoly powers and commensurate profits in global value chains.

To sum up, the internationalization of ever stronger exclusive control rights for digital artifacts entrenches current inequalities in income generation and innovation. It creates ownership rights of unprecedented scale and scope that cover digital architecture, content and future applications and it places these entitlements firmly in the hands of first movers who are heavily concentrated in advanced ICT using countries. Given the cumulative and interdependent nature of digital innovation strong IP not only restricts the use of today's non-

¹⁰⁸ For an application of the positional resource concept to legal rights see Pagano, 2002.

¹⁰⁹ For an introduction to global value chain analysis see Kaplinski/Morris, 2001; for a focus on Internet issues see Gereffi, 2001.

rivalrous innovations but also the tomorrow's innovative capacity of latecomers that need to buy permissions for generating sequential or follow-up innovations. IP gives first mover innovators the chance to move ahead while locking laggards into the commodification struggle. Inequalities in IP distribution, promote inequalities in opportunities, which in turn project current income inequalities into the future.

The social contract that underpins IP rulemaking also suffers, where innovators live and most innovative activity and follow-on production takes place outside the fiscal reach of the domestic jurisdiction. In such a context, strengthening IP rights in a developing country that mostly consume rather than create innovations, paves the way for a mere resource transfer to the IP asset-holding country of significant scale. Linking this to the discussion and reframing of the dominant IP discourse yields an interesting insight for a distributive justice argumentation.

What is commonly perceived as 'losses from international piracy', constitutes a resource gain for developing countries on the imitating end. In light of what has been discussed earlier, it would not even be justified to call this a resource transfer, not to mention piracy, since strictly speaking nothing is subtracted from the digital resources held by the producing country.¹¹⁰

3. *The magnitude of welfare gains*

In order to illustrate the scale of these welfare gains Annexes 1-3 compare the value of imitating digital products with some other resource transfer indicators.

The results are quite surprising. In 2001 resource gains from copying digital artifacts reached more than 15% of net Foreign Direct Investment inflows for India (15.7%), Malaysia (19.8%), Belarus (22.2%), Russia (31.2%), Ukraine (43.1%) and Paraguay (320%)¹¹¹.

Moreover, the resource gains on country level equal more than 50% of total received official development assistance (ODA) in Belarus (50.4%), Russia (54.1%), Colombia (73.7%), Uruguay (82.5%) and even more than double the value of ODA to China (111.3%), Costa Rica (116.5%), Chile (125.0%), Venezuela (162.8%), Brazil (219.7%), Argentina (250%), Paraguay (321%) and a staggering 724.1% in Malaysia.

Or, more closely related to the ICT sector, the value of duplicating digital artifacts in 2001 is equivalent to more than 9% of private investment in telecoms in the Dominican Republic, Malaysia, Colombia, Azerbaijan, Georgia and Russia in the same year. It reaches more than 20% in Ukraine, Uruguay and China and even more than 90% of the value of private telecommunications investment in Pakistan, Paraguay and Belarus.¹¹²

¹¹⁰ Along similar lines a handful of earlier studies have emphasized the distributional aspects of the TRIP agreement. McCalman, 2001, for example seeks to quantify the resource transfers and finds that the US is the main beneficiary, seeing the value of *annual additions* to its patent portfolio rise by 4.5 billion USD.

¹¹¹ Figures for Paraguay include transshipment values.

¹¹² See Annex 1-3.

Or in aggregate terms: the total welfare gains from copying by only the top 50 developing countries are put at 8.8 billion USD. For a comparison, in the same period the total disbursement of new loans by IDA the soft loan facility of the Worldbank was 5.5 billion USD.¹¹³

And with a particular focus on business applications: the welfare gains from free use of business software applications in developing countries in the Asia Pacific (3870 million USD) amount to 60% of total worldwide official development assistance earmarked for economic and service infrastructures in the same region in 2000 (6500 million USD).¹¹⁴

Of course, these comparisons should not be overstretched. The volume and value of transactions would drop dramatically, if IP rights were to be enforced, since demand is price-sensitive. But the same goes for the framing as estimated losses from piracy. Not all of these so called losses from piracy would turn into realized gains for IP owners. However, given the nonrivalrousness character of digital artifacts, the framing as welfare gains for developing countries appears more plausible than the framing as losses from piracy. It strips away the moral pretense and lays bare the essential distributional implications that underpins this controversy. Again it should be emphasized that the welfare gains on the part of developing countries do not equal transfers in a strict sense, since the US or other industrialized countries economies are not directly deprived of even a single software package.

4. Procedural aspects of distributive justice

A caveat is in order. Not all of the trends I charted have yet achieved global significance. However, some major international agreements already contain provisions that facilitate the digital land grab internationally. As outlined earlier, the WIPO Internet treaties, so far signed into force by almost 40 countries, mandate legal protection for DRM systems. The WTO/TRIPS agreements make possible and, according to some influential interpretations even require, to expand patent protection to software. International private law favors the cross-jurisdictional recognition of private contracts, thereby paving the way for private ordering at international level.¹¹⁵ Some other trends are currently confined to national jurisdiction such as the US and the European Union. However, these are the pace-setting jurisdictions, which develop the IP norms that tend to be propagated and eventually adopted internationally.

These mechanisms for internationalizing IP norms need to be considered in some more detail.

¹¹³ Sources: IIPA, 2003; Worldbank IDA Annual Report (website).

¹¹⁴ Sources: BSA 2003, OECD: DAC Statistics (website).

¹¹⁵ A related forum is the Hague Conference on Private International Law, where the future Hague Convention on International Jurisdiction and Foreign Judgements in Civil and Commercial Matters is under negotiation (www.hcch.net/e/workprog/jdgm.html); for an analysis with regard to IP and Internet issues see www.cptech.org/ecom/jurisdiction/hague.html.

So far I have mainly discussed the cognitive and normative underpinnings of substantive digital IP rules and their relation to distributive justice.

As much as ideas, mental templates and framing might matter, they are only part of the story. At least equally important are the formal institutional arrangements for IP rule-making, their accessibility, selectivity and concrete decision-making procedures and, more generally, the political economy that underpins them. Examining these arrangements in more detail is also very important from the perspective of a more encompassing understanding of distributional justice that adds procedural to substantive criteria in order to evaluate the overall fairness of a rule-system.

How open, accountable, participatory and equitable is the development of global IP norms for the digital economy? This is a complex question. As the discussion of substantive IP issues has shown, the rules for control over digital artifacts are co-produced in a variety of fora, some of them technology-related, some of them focused on IP law and jurisdiction, some of them more fundamentally concerned with the principles of public vs. private ordering. Given the scope of this paper, I will in the following briefly flag some of the major issues in two interrelated areas: the general political economy that underpins collective decision making with regard to intellectual property rights, and, some specific characteristics of IP rule-making with particular attention on digital artifacts. I will argue that the overall system is conducive to what some have described as a 'ratcheting-up' of global IP standards, where stronger protections introduced in some pivotal fora pave the way for even stronger exclusive controls in related fora and, over time, generate a self-reinforcing circle of every stronger IP protection.

a) Some notes on the political economy of IP rule-making

Irrespective of formal procedural arrangements, the very nature of the IP discourse makes it unlikely that all stakeholders will be equitably represented at the bargaining table for a number of reasons.

First, the struggle over exclusive control and access pits two very different stakeholder groups against each other. Directly benefiting from stricter exclusive controls are large existing IP asset-holders, typically the dominant corporate player in an industry. On the other end, the potential benefits of enhanced access are rather indirect and accrue to an illusive and dispersed group of consumers, small-scale industries and future innovators. The incentives to partake in the policy discourse as well as the capacities to bundle voices and organize collective action are distributed very unevenly. Large IP asset holders typically command sizeable lobbying budgets and as established industry players an associational infrastructure to formulate and voice collective claims in favor of stronger controls.¹¹⁶ At the same time, proponents of less protection face the daunting task of organizing a multiplicity of fragmented

¹¹⁶ According to figures by the Centre for Responsive Politics, the US software industry donated a total of 13 million USD to politicians over the 2002 election cycle, with Microsoft, the world's largest software maker contributing 30% and the top 5 contributors (all large software makers) accounting for 70% of donations (www.opensecrets.org).

smaller voices into a coherent policy platform. Even more fundamentally, pro-access advocates need to convince *potential* and often non-expert beneficiaries to commit resources to a cause the merits of which are so difficult to communicate against the backdrop of what has been found to be a very biased yet suggestive policy discourse.¹¹⁷

What's more these asymmetries in incentives and collective organizing are exacerbated at the international level. For countries with large knowledge industries and considerable IP assets stronger IP protection abroad secures additional revenues for their domestic industries. Stronger international IP standards become a matter of national interest. As a consequence, industry groups in these countries get a sympathetic hearing from their national negotiators, who also typically command well-developed bargaining resources. In contrast to that, negotiators from developing countries with different industrial structures and small intellectual property holdings tend to prioritize other policy issues such as market access for agricultural products. Policy-makers are likely to receive little input from fragmented beneficiaries of pro-access initiatives and typically find it difficult to muster the resources for developing positions on highly technical and arcane subject matters. Apart from human emergencies, such as HIV/Aids medication, IP issues are typically treated as bargaining chips to achieve concessions elsewhere. The history of the TRIPS agreement provides for an intriguing illustration of these mechanisms. US industry groups found it easy to heave intellectual property issues onto the agenda of international trade negotiations in a context at a time when US trade imbalances were growing and domestic knowledge industries constituted the major drivers for export. Tying IP issues to concessions in other areas, led to a take it or leave it choice, paving the way for developing countries to trade in illusive future gains for immediate benefits of market access for textiles or agriculture.¹¹⁸ The upcoming Doha trade round might replicate these dynamics within the IP sector. Pertinent negotiations on TRIPS are heavily – and rightly - focused on pharmaceuticals and the role of bargaining chips might this time fall on digital intellectual property rights, whose nature is arcane and benefits only accrue in the future.¹¹⁹

The point here is not that a re-prioritization of issues would be desirable, but that the current negotiation environment cum incentive structures is conducive to sidelining and sacrificing important emerging issues. In the context of asymmetric capabilities for collective action, and tied bargaining, digital IP rules are unlikely to receive a thorough hearing and proper evaluation. IP rules for the digital economy created under such conditions can hardly be considered fair, irrespective of formal bargaining equality.

¹¹⁷ For a detailed case study of lobbying efforts by the ICT industry in the US see Hart, 2002.

¹¹⁸ See Drahos, 2002; Steinberg, 2002, Shadlen, 2001, Reichman/Lange, 1998.

¹¹⁹ See for example the post-Doha controversy about the range of diseases to qualify for some TRIPS exemptions (Doha Article 6, documentation at: <http://www.cptech.org/ip/wto/p6/>).

b) IP rules as Prisoner's Dilemma

The self-sustaining dynamic of IP advocacy is also fueled by another feature of IP rules. They constitute what economists call a prisoner's dilemma: although an overall situation with less restrictive IP rules might be overall preferable individual players face the incentive to expand their IP holdings and then call for stronger protection of their asset base. How can this be explained? First, a cumulative innovation environment confers market power according to relative differentials in IP holdings. The players with the relatively larger holding will find it easier to block competitors or force co-operation through his IP asset base. Facing a competitor that focuses on enlarging and aggressively using its IP assets, other players are forced to do the same for defensive reasons.¹²⁰ The result is what could be termed a patent race towards more IP and its aggressive harvesting. Simultaneously, competitors that are relatively ahead find it beneficial to call for stronger exclusive controls, since they stand to profit disproportionately from such a move.

The same mechanisms are at play internationally and further undermine the prospects for a coalition on less restrictive controls: As Drahos notes, some advanced developing countries that have spearheaded developing country efforts to oppose stronger IPs have by now developed limited IP holdings of their own. As a consequence, they find it beneficial to join industrialized countries in their call for stronger international IPs.

In all these situations, private concentrated gains from stronger IP stand in contrast to dispersed public losses in form of less innovation, less competition etc. In economic terms, gains are internalized, while losses can be largely externalized.

c) Technical insulation – multi-fora complication

The fragmentation of IP rule-making is particularly intense with regard to digital artifacts for two major reasons. First, it stems from the pervasiveness and versatility of digital technologies that run the entire gamut of IP sub-issues such as trademarks, patents, copyright and even sweat-of-the-brow database rights. Second, it is rooted in the particular development trajectory of the main global digital infrastructure: the Internet. IP rules for the Internet are not only created in the established fora for international rule-making such as WTO or WIPO, where developing countries enjoy formal representation and participation rights. Governance for the digital economy is negotiated and produced in a variety of fora, some private, some public, some extensions of established international institutions, others novel entities of uncertain international legal standing. The reasons for this governance patchwork can be traced to the peculiar way the Internet evolved. The net of networks developed in rather unplanned fashion as bottom-up co-operative effort of a closely knit developer's community, with governance mechanisms created ad-hoc along the way and initially underwritten by personal authority and informal professional norms. With the

¹²⁰ For empirical evidence on defensive patenting see Cohen et al., 2000.

formalization of governance arrangements and accountability structures still under way, important decisions with regard to international intellectual property rules are taken in a number of fora, including:¹²¹

- Private sector standard's organizations (SOs), which play a pivotal role in determining the significance of intellectual property rights for soft- and hardware architectures. Consortia such as the W3C (<http://www.w3.org/>) or IETF (www.ietf.org/) set rules to what extent the standards they adopt can contain proprietary hard or software and thus whether the main building blocs for digital architectures are freely available to all developers or can be controlled by IP rights holders.¹²²
- Novel governance entities such as the Internet Corporation for Assigned Names and Numbers (ICANN) established as experimental form of self-governance with formal institutional structures still in flux. ICANN is incorporated under Californian non-profit law and deals with IP issues related to trademarks in the domain name system.¹²³
- Established intellectual property fora, such as the TRIPS council at WTO or WIPO.

Equitable stakeholder representation in general and developing country participation in particular is far from guaranteed for a number of reasons:

Private standard's organization vary in their degree of openness and often adhere, in line with public perception, to the principle of technocratic insulation. They operate as industry associations and have only reluctantly opened their doors to public interest representation, fearing an over-politicization of their work that compromises engineering integrity and collaboration. At the same time, meaningful public interest representation, as desirable as it would be in these pivotal decisions on digital design, is difficult to sustain due to the complexity of the subject matter and the absence of formal participation structures, not to mention an active promotion of developing country representation. Developing country participation in emerging governance arrangements such as ICANN might be more formalized. But it suffers from asymmetric access to judicial and legal oversight over that comes with an entity that is incorporated under Californian non-profit law and is thus ultimately tied to answerable to the US administration only.

d) Forum shopping and bilateral pressures

However, the main problem with the fragmentation of relevant rule-making is that it opens the possibility for forum shopping, a strategy aggressively pursued by industrialized country negotiators.

When negotiations on the expansion of IP rights ground to a halt in the WIPO process, US rights-holders switched in the mid-1980s to the WTO negotiations as their forum of choice

¹²¹ See Davidson/Morris, 2003 for an overview of Internet related SOs and Lemley, 2002 on SOs and IP.

¹²² See Lemley, 2002.

¹²³ For a comprehensive account of the ICANN history see Mueller, 2002.

and eventually accomplished a remarkable internationalization of stronger IP standards through the TRIPs agreement.¹²⁴ Likewise, trademark protection in the domain name system was pursued through WIPO and ICANN at the same time.¹²⁵ These multi-pronged strategies allow to seek out the most favorable environment for one's cause and make it more likely to catch developing country negotiators, who command less resources to establish a viable presence in all relevant fora, off guard.

Most aggressively however, are stronger IP standards propagated through bilateral relations. Various carrot and stick measures are deployed by IP supporting countries to induce higher IP standards abroad. In the stick department, the US, for example, has established a system to monitor infringement of her intellectual assets around the world and authorizes trade-based retaliation measures in case of excessive infringement. On the carrot side, the US offers preferential market access through bilateral trade agreements in exchange for advanced intellectual property standards to be implemented by her trade partners.¹²⁶ Often, these IP provisions go beyond the standard mandated by TRIPS and thus pave the way for stronger international IP norms. Business method patents, the controversial suspension of the idea/implementation dichotomy, are high on the agenda. The US is believed to push for stronger protection overseas in several bilateral negotiations, including at least one developing country, Jordan.¹²⁷ The implications for distributive justice can be expected to be enormous. As outlined earlier 40,000 software patents, many on quite trivial online business ideas, were already registered in the US by 2002. Achieving international recognition would vastly expand control over various Internet related business ideas to US rights-holders.

From a procedural justice perspective, the use of bilateral measures leaves developing countries more vulnerable to strong-arm tactics. It circumvents the established formal international negotiation structures that help developing countries bundle their resources and bargaining powers and that provide them with formalized veto rights. The bilateral push towards stronger IP in contrast appears as an attempt to strengthen international standards through the backdoor.

To sum up, the institutional arrangements for devising global IP standard for the digital economy exhibit a number of shortcomings from a fairness perspective. Some of these problems relate to the diversity of digital IP policymaking as a complex, variegated field of issues that cuts across organizational and thematic boundaries of conventional public interest representation. These problems are augmented by the patchwork nature of ICT governance that comprises a wide variety of fora and organizational types, rooted in the history of the Internet.

¹²⁴ See Drahos, 2002, Shadlen, 2001;

¹²⁵ Participant observation ICANN conferences 1999-2001.

¹²⁶ See in particular Drahos, 2002.

¹²⁷ Information on early stages of trade negotiations is typically not made public. But see the collection of drafts and MoUs by consumer advocacy group Consumer Project on Technology at <http://www.cptech.org/ip/business/international.html>.

Other obstacles appear intrinsic to IP and the prisoner's dilemma-like incentive structures they create. Stakeholders are more likely to get involved in the policy discourse, when they stand to profit from stronger IP. And IP portfolios need to be aggressively asserted if competitors can be expected to do the same.

A less concrete, yet very important, set of obstacles relates to the lop-sided vocabulary, metaphors and cognitive templates that prejudice the IP discourse and make it very difficult to formulate an alternative position that appears morally defensible and politically feasible.

These systemic challenges aside another, closely related set of problems to achieve equitable representation and informed decision making stem directly from the negotiating strategies adopted by some industrialized countries. Forum shopping stretches developing country policy negotiation resources to the limit. Tying of issues in international negotiations raises the stakes and the threat potential and forces developing countries to sacrifice digital IP issues for the sake of gains elsewhere. This is even more true for bilateral arrangements where IP issues are sold for preferential market access.¹²⁸ Under all these strategies the appearance of formal freedom of choice and informed consent on the part of developing countries is upheld. Yet, effectively, the overall bargaining arrangements and strategies exhibit a significant extent of strong-arm tactics. Making market access conditional on concession with regard to IP rules or threatening retaliatory trade-sanctions for countries that disagree on what constitutes appropriate domestic IP legislation does not satisfy the conditions of free and informed choice. Of course, none of these strategies are new, nor are they at all surprising from a realist perspective on international relations. But they are very important for an evaluation of the procedural fairness of IP rules. The finding of significant strong-arm tactics in IP rule-making strips away the ethical pretense that global IP rules are the product of free choice or a "global consensus" as is often alluded to in high-level policy statements.¹²⁹

V. Beyond the towards: just arrangements for a global digital economy

Taking distributive justice serious and devising institutional arrangements for a just distribution, or better, institutional arrangements for the maximization of global benefits from digital technologies, requires a multi-level approach. It is a daunting task, but is less impossible than the discouraging dynamics towards a digital land grab under firm control of a few industrialized countries might suggest. One does not need to start from scratch. The seeds for an imaginative rewiring of the discourse are in place and practical applications have moved beyond proof of concepts and provide a concrete alternative perspective on how to move forward. I will argue my case by reviewing alternatives and linking them with some

¹²⁸ See Steinberg, 2002, Reichman/Lange, 1998.

¹²⁹ See for example the declaration by the Asian regional preparatory meeting on the World Summit on the Information Society, which refers to a "consensus on IP issues achieved in multilateral organizations" (The Tokyo Declaration: The Asia-Pacific Perspective to the WSIS http://www.wsis-japan.jp/documents/tokyo_declaration.html).

concrete prescriptive suggestions on four interrelated levels: technology, content, discourse and rule-making procedures.

A. Discourse: imaginative tropes and framings for a less biased approach

On the conceptual level efforts need to be made to reframe the discourse on IP and strip it of its misguided moral intuitions and unfounded utilitarian presumptions. This endeavor need not mean to reinvent the wheel. As the discussion has shown, an alternative conceptual vocabulary and fresh theoretical and empirical thinking on the issues do already exist. On closer inspection, the legal vocabulary provides an array of helpful concepts such as fair use, temporary monopoly, idea/expression dichotomy, when thinking about intellectual property rules. This established body of conceptual caveats can be linked to emerging thinking on property and innovation in law and economics that revolves around terms such as “anti-commons” or ‘cumulative innovation’. Gradually emerging from this work is also a more catchy rhetoric with concepts such as *digital land-grab* or the *new enclosure*, that has the potential to redraw the moral intuitions that underpin the IP policy discourse. What needs to be done is to interconnect and, most importantly, to internationalize a wealth of scholarship on these issues, which so far is mainly confined to some law schools in the US and partly Europe. Given the technical complexity and specificity of the issues, *the responsibility would in the first place fall to academics, think tanks and some specialized public interest advocacies to communicate these findings to a broader public* and equip policy-makers in developing countries with valuable templates, cognitive and normative, to stake out an alternative policy vision for ownership rules in the global digital economy. Exemplary initiatives in the US that await replication in other countries include public interest law clinics for cyberlaw. These clinics not only provide much needed legal assistance in practical litigation cases. Closely linked with prestigious law schools such as Berkeley or Harvard, they are themselves breeding grounds for innovative legal thinking and provide future members of the legal community with a broader perspective.¹³⁰

B. Technology as site of agency and principled action: the example of open source software

When thinking about distributive justice in relation to the properties of the technology itself, it is very important to avoid a sense of technological determinism. Agency is possible and feasible. None of the current developments are inevitable, nor does reworking them pose an insurmountable challenge. Digital architectures are less than many others technology bound by the laws of physics and chemistry. They are acts of design, subject to rules of logic and in

¹³⁰ See for example the Samuelson Law, Technology and Public Policy Clinic at Berkeley Law School (<http://www.law.berkeley.edu/cenpro/samuelsion/index.html>); or the Berkman Center at Harvard Law School (<http://cyber.law.harvard.edu/>).

theory, the capacity of electronic circuitry. Advances in computing, however have so dramatically expanded the latter that it does not pose a real limit for mainstream applications. This opens a wide design space and the opportunity to intentionally inscribe social values into the technology. As one prominent legal observer puts it: code (computer code) is law".¹³¹ Agency matters.

The most intriguing illustration of both possibility and, more specifically, for a paradigmatic implementation of justice principles is provided by the triumph of Open Source Software (OSS).¹³²

OSS has moved way beyond mere proof of concept and increasingly captures the imagination of social entrepreneurs that seek to organize collaborative projects in other fields.¹³³

OSS development is based on the principle of open access to the source code, i.e. the detailed blueprint of a software program. This transparency comes with the explicit permission to rework, refine, or adapt program parts to one's own ends. The principle of open access has nurtured a unique collaborative development environment. Voluntary developers all over the world self-organize into project-oriented working groups, offering their skills in exchange for recognition and social status within the professional community. Informal social codes govern the development process with peer review conferring social authority. Technical pragmatism in conjunction with rough consensus rules determine the adoption of specific solutions.¹³⁴

With these features OSS appears like a hopeless utopian undertaking, unfit to produce the governance capabilities to implement large-scale distributed development projects, not to mention the long-term incentives to garner broad support and sustain participation.

However, OSS is remarkably successful. It is driven forward by a huge development community and its core module has grown to more than 3 million lines of computer code. OSS applications are the products of choice for handling a number of critical tasks, that require highest reliability and stability, at the core of Internet. In fact OSS with its open development mode and premium on interoperability is commonly viewed as a critical driver of the success of the Internet.¹³⁵ In all these markets OSS applications outperform rival private sector products offered by the largest corporate sector ICT players, which bring deep pockets, unrivalled marketing muscle, and the most professional corporate know-how to the development process. In contrast to the tenuous empirical backing for stronger IP rights, OSS provides a powerful counterfactual. It constitutes compelling evidence for innovation in the digital arena in the absence, or even *due to* the absence, of exclusive control rights.¹³⁶ These

¹³¹ See Lessig, 1999b.

¹³² Experts usually distinguish between Open Source Software and Free Software but the difference does not matter for the discussion here.

¹³³ See Schweik, 2003.

¹³⁴ For analyses of open source see Weber, 2000 and 2003; Moglen, 1999.

¹³⁵ See Weber, 2003.

¹³⁶ What is interesting from an epistemic point of view is the flurry of technical economic papers that have popped up to show the social efficiency of OSS. It indicates the 'pliability' of economic modelling

successes in technical back-office applications notwithstanding, it is far from clear whether OSS can play a viable role in the front-office, the end-user application market, where it competes head on with the world's largest software maker and its entrenched proprietary global standard, the Windows operating system and the Microsoft Office suite of applications. The advantage of Microsoft is shored up through high-switching costs, network-effects, economies of scale and unrivalled control over distribution and marketing channels.

Why is this important from a distributive justice perspective?

Open source as non-proprietary software provides an impressive counterfactual to invalidate the claim that innovation requires appropriation and exclusive control in the software market. Quite to the contrary: an internal memo by a large proprietary software maker, for example, warns that the innovative dynamics generated through the OSS development process cannot be matched through a proprietary corporate development model.¹³⁷ As a consequence, rules that introduce artificial scarcity of what would otherwise be a nonrivalrous artifact are difficult to justify from a utilitarian perspective, bringing the distributional opportunities of open access to the fore.

OSS also dispels the claim that the absence of exclusive control rights hems the development of business models and related industries, a point frequently raised in the discussion on the detrimental effects of 'software piracy' in developing countries. Again, emerging evidence suggests the opposite. A flourishing industry has evolved around OSS that customizes, maintains and services OSS applications. This is of particular importance to developing country software markets, since many of these ancillary industries are local in nature, opening opportunities for local industry development and foreign exchange savings.¹³⁸ Not only does OSS stimulate the development of these supplementary local markets, it is widely expected to provide a bigger impetus than proprietary software. Open access to the source code lays the foundation to a competitive market. Everyone can see the inner workings of the software and offer ancillary services or customization. In contrast to that, the monopoly owner of proprietary software retains control over the inner workings of the software and thus becomes a gatekeeper for the provision of these ancillary services. Observers believe that the main cost advantage of OSS flows from this competitive service market.¹³⁹

More generally, OSS and its advantages illustrate the problematic nature of restrictive IP rules in a context of heavily interrelated markets, where monopoly rights are prone to being leveraged into adjacent markets, thereby further chipping away on the equality of opportunity in this area. It should also be noted that these ancillary industries are by no means marginal. As outlined earlier software services account for the bulk of revenue and value generation in the ICT sector, more than double the value of core software development.¹⁴⁰

and makes the profession's common claim to deductive purity appear somewhat hollow. For example of these economic modelling attempts see Quah, 2002 or Garzarelli, 2002.

¹³⁷ For excerpts see <http://www.opensource.org/halloween/halloween1.php>.

¹³⁸ The latter was directly cited as an important factor by a South African commission (see Weber, 2003).

¹³⁹ See Weber, 2003.

¹⁴⁰ See IDC, 2003, p. 5.

From an applied legal perspective OSS provide a set of innovative licensing templates such as the General Public License that can be harnessed to ensure continuous open access to the source code of the software in subsequent development stages.¹⁴¹

But OSS also emerges as a change agent on a much more fundamental level. It facilitates a reevaluation of fundamental governing principles and values in the information society. Digital technologies provide the predominant modes for encoding, storing and transmitting public information, or more broadly the memory and knowledge base of societies. Given this pivotal importance, control over these technologies and their development poses the democratic question. Reliance on proprietary technology standards and architectures is increasingly believed to generate undue public dependence on private suppliers for continuous, affordable access. The alternative OSS vision of a distributed, open, transparent development environment raises the expectations on the democratic qualities that can be achieved for socio-technical arrangements in the information society. Enhanced democratic accountability and control over vital public functions appears feasible, and rests upon a re-thinking of shared beliefs on the role of exclusive property rights in digital artifacts.¹⁴²

To sum up, from a distributive justice perspective open source arrangements provide a mechanism to maximize the non-rivalrousness properties of software and curb related rent transfers to global software producers. It spurns the development of local markets and a more leveled competition in services markets. With its open development environment it offers greater participation in developing the digital architectures of the future that carry out essential democratic functions, and makes it possible to adapt them to local conditions.

How can the benefits of open source be maximized? What are the policy implications?

Open source has become a site of intense lobbying. Due to its proven success and a committed developer's community, public awareness and public interest representation are relatively developed. A number of OSS initiatives have been launched in developing countries, ranging from a large-scale OSS development project in China¹⁴³ to envisaged local implementations in the education sector in Mexico.¹⁴⁴

But considerable policy challenges remain. One problem stems from the fact that the long-term strategic advantages of open source are difficult to quantify, while immediate switching costs are clearly visible. In conjunction with enormous targeted lobbying pressure by

¹⁴¹ For more information see <http://www.gnu.org/copyleft/gpl.html>.

¹⁴² For an emphatic exposition of these values see an open letter by a Peruvian lawmaker to Microsoft in defense of open source software as democratic principle (see http://www.opensource.org/docs/peru_and_ms.php).

¹⁴³ See Internetnews.com: "China's Red Flag Joins Unbreakable Linux", May 7, 2003 (www.internews.com).

¹⁴⁴ See Newsforge: "Why the Universidad Pedagógica Nacional Supports Open Source", February 11, 2003 (www.newsforge.com). For an overview of some national OSS policy approaches see Weber, 2003.

proprietary software vendors this creates a difficult environment for public sector representatives that seek use their critical mass purchasing power for switching to OSS applications.¹⁴⁵ These problems are international in nature. As a result of intense lobbying, international statements of ICT policy principles shy away from fully endorsing OSS. On request of the US delegation a recent declaration by the Asian preparatory conference for the World Summit on the Information Society was modified. A call on governments to 'support' for OSS was altered to 'encourage[ment] as appropriate.'¹⁴⁶ From a public policy perspective this semantic difference can potentially be very relevant. The failure to establish a firm principled endorsement of OSS in conjunction with the cost-benefit difficulties outlined earlier makes a decision in favor of OSS potentially vulnerable to discrimination charges. A number of upcoming international public policy events provide the opportunity to strengthen the recognition of OSS. An example is the UN-sponsored World Summit on the Information Society to be held in two rounds in Geneva (end of 2003) and Tunis (2005).¹⁴⁷ A commitment to OSS principles can augment the choice for public sector buyers, who, with their pivotal purchasing power, could help establish OSS as a viable alternative in the application software market.¹⁴⁸

C. Content: Reworking incentives and models for broader access

With regard to digital content some encouraging initiatives have been launched to mitigate the existing global information asymmetries. Analogous to the open source licensing system for software, an initiative of leading IP scholars in the US has developed a set of model contracts for digital content. These 'open content' legal templates makes it easier for originators to broaden access to their creations without compromising on rights of attribution. This so called 'Creative Commons' initiative has been launched in 2001 in the US and in June 2003 adapted to European law.¹⁴⁹ At the end of May 2003 open content licensing initiatives have yet to be brought to the attention of a wider audience and reach a critical mass of users. International organizations could play a vital role to enhance global awareness and facilitate the localized adaptation of these boilerplate templates. UNESCO does pay some attention to these

¹⁴⁵ For an example of intense lobbying by proprietary software makers with regard to public sector purchase decisions see CNet: "Open Source Battle Rages in Oregon", April 9, 2003; for a global lobbying effort see the incongruously named *Initiative for Software Choice* (<http://www.softwarechoice.org>).

¹⁴⁶ For declaration see http://www.wsis-japan.jp/documents/tokyo_declaration.html; for news report on negotiations see The Register: "Why US Gov Reps Mugged Pro Open Source Declaration", February 02, 2003 (www.theregister.co.uk).

¹⁴⁷ See www.itu.int/wsis/.

¹⁴⁸ The policy context is somewhat different for the issue of non-proprietary software *standards* as opposed to full-scale software applications. These standards are usually agreed upon by industry associations in a variety of expert fora. As a consequence, public awareness about upcoming decisions as well as direct participation by elected public representatives are limited, delineating a vital role for public interest oriented civil society activity in this area. Some specialized ICT policy advocacy groups are beginning to get involved (for example the Center for Democracy and Technology, www.cdt.org) but a broader representation of public interest advocates from other countries has yet to develop.

¹⁴⁹ Initiative by the German Institute for Legal Issues of Free and Open Source Software (www.ifross.de).

innovative model rules but more could be done to link them to relevant policy fora.¹⁵⁰ Some important multilateral organizations such as WIPO with its unprecedented access to IP policy practitioners around the world are very inflexible in incorporating these issues into its work program. A review of the various information campaigns and in-country policy training workshops makes barely any reference to innovative approaches to IP. Analogous to patent offices, WIPO rather understands itself as service provider to help IP administrations work more effectively and strengthen global protections.

With international institutions not assuming a progressive role, who could be a potential change agent? Content creators could take it upon themselves and work towards more equitable access to their creations, given that model contractual agreements are readily available.

In the academic sector, several initiatives have been launched that seek to harness the Internet for broadening access to scientific information around the world rather than deploying ICT to maximize rent extraction.

Examples at the policy and advocacy level include the *Budapest Open Access Initiative*. This initiative seeks to raise awareness about the opportunities of broadening access to scientific information via digital technologies and promotes conducive policy and best practice principles.¹⁵¹ Similarly, UNESCO has sponsored a series of conferences on public access to scientific information, leading to a set of draft policy guidelines.¹⁵²

At the practical level, a very successful application is the *arXiv* repository for scientific preprints in physics and mathematics.¹⁵³ Launched in 1991 *arXiv* provides free online access to more than 200 000 articles submitted by scientists. Cost estimates find that total library subscription expenses for high-profile journals in these fields amount to 10,000-20,000 USD per *published article*, whereas global publishing in *arXiv* incurs costs at the order of one to five USD.¹⁵⁴

With regard to related technical infrastructures, The *Open Archives Initiative* develops technical tools and standards to facilitate the exchange of content in open archives¹⁵⁵

Examples for initiatives that specifically focus on developing countries are:

- The *Ptolemy Project* provides access to electronic journals for health practitioners and scientists in East Africa through remote accounts with the University of Toronto

¹⁵⁰ See http://www.unesco.org/webworld/public_domain/public_inf.html.

¹⁵¹ See <http://www.soros.org/openaccess/index.shtml>. For the policy declaration signed by a growing number of academic content producers see <http://www.soros.org/openaccess/read.shtml>

¹⁵² The draft guidelines are available at:

http://portal.unesco.org/ci/file_download.php/Public+Domain+Guidelines.final.doc?URL_ID=8376&filename=10479795010Public_Domain_Guidelines.final.doc&filetype=application%2Foctet-stream&filesize=270336&name=Public+Domain+Guidelines.final.doc&location=user-S/.

¹⁵³ See <http://www.arxiv.org/>.

¹⁵⁴ See Ginsparg, 2001.

¹⁵⁵ See <http://www.openarchives.org>.

library. In order to comply with journal licensing requirements, the 100 participants had to be designated as research associates to gain lawful access to the collection. An evaluation shows the practical relevance of *Ptolemy* for users in Africa, but fails to address questions of scalability that would most likely raise IP related issues as to the scope of licensing and lawful access through affiliations.¹⁵⁶

- *Bioline International* takes the reverse approach, which is very interesting from a global justice perspective. Rather than conceptualizing developing countries as mere consumers of information produced elsewhere, the initiative seeks to broaden access to and enhance the visibility of scientific journals published in developing countries. Established in 1993 it provides an online publishing infrastructure and related services to biomedical publications in India and elsewhere.¹⁵⁷
- The *International Network for the Availability of Scientific Publications (INASP)* works both ways. It negotiates free or low cost electronic access to more than 70000 scientific journals for developing countries and also promotes online publishing efforts for domestic research emanating from these countries.¹⁵⁸

These encouraging developments notwithstanding, more needs to be done to prevent that IP and publication rules become roadblocks to broadening access to scientific research. Persistent problems include:

- Pre-publication is often discouraged, since it counts as publication and disqualifies from being submitting an article to journals that only accept unpublished work;
- The publishing market is far from competitive. Academic promotion criteria require to publish in a small number of coveted top-journals. Moreover, the scientific publishing, exhibits oligopolistic tendencies, in particular in Europe. As a consequence libraries and publishing scientists alike depend on a small number of star journals owned by an even smaller number of publishers, who can extract monopoly like rents; and,¹⁵⁹
- Strategic competition issues could obstruct concerted action: making access to scientific publications affordable to everyone deprives rich universities of an opportunity to set themselves apart from other schools and gain a competitive edge through better library access. Not dissimilar from patent consortia, a likely scenario under self-organized publishing is the emergence of strategic content pooling partnerships among groups of elite universities and the retention of rent-extraction options and pay-per-access models with regard to a wider audience.

Given these difficulties, the principal responsibility to ensure the success of open access initiatives lies with the academic community and the codes of promotion, conduct, and

¹⁵⁶ See Beveridge, 2003.

¹⁵⁷ See <http://www.bioline.org.br/>.

¹⁵⁸ See <http://www.inasp.info/index.html>.

¹⁵⁹ For a extensive collective effort to change the terms of publishing that failed in the face of these difficulties see Chronicle of Higher Education: "Journal Boycott Over Online Access is a Bust", May 16, 2002.

collaboration that it devises for itself. The degree of openness and availability varies widely across disciplines, indicating both what is possible (e.g. physics with a distinguished open access culture) and where reform is timely (e.g. many life sciences). But public policy decisions, in particular IP rules can also make a difference. Public research funding can be more closely linked to conditions of open access to research results and related IP rules on the private appropriation of academic research need to be made consistent with the open access principle. Competition regulators need to take a close look at the academic publishing market. This is of particular importance in the new environment of technical DRM systems and contractual innovations that dramatically expand capabilities for exclusive control over digital artifacts.

D. IP rules and procedural issues

As these encouraging developments show an alternative vision for maximizing the digital opportunity for global distributive justice is in the making. A number of nascent initiatives work towards a technological architecture and content arrangements that are organized around more equitable principles of access, use and development than the extant property paradigm. It is unlikely that these initiatives will effect significant changes, without a conducive legal and regulatory environment. A conducive public policy agenda would need to attend to a variety of issues, including

- Shorten the copyright and patent terms in view of the rapid obsolescence and innovation in the ICT sector;
- Contain the gradual expansion of IP into basic ideas and factual information by taking the idea-expression dichotomy serious, rethink the patentability of software, as well as sweat-of-the-brow rights in non-original data collections;
- Recognize the distributional opportunities arising from the nonrivalrousness of many digital artifacts and mandate broad and affordable access to information generated by the public sector or through public funding;
- Formally recognize a set of positive information rights that provides an important proactive legal anchor for defending important principles of open access and distributional justice in the light of upcoming challenges that cannot be anticipated by current legislation. Such a rights-based framework also provides a reference point for investor's expectations and should help to set longer term economic incentives for business models and infrastructure development that incorporate these values proactively;¹⁶⁰

¹⁶⁰ Approaches to such a framework could be grounded in a human rights perspective. For a brief overview of the history of communication as a human right see McIver, 2000, for a comprehensive book-length analysis see Hamelink, 1994; for an examination of human rights and IP see Chapman, 2002; for an explicit attempt to develop copyright into information rights see Bechthold, 2002.

- Clarify the relation between private and public ordering in view of these information rights;
- Ensure that non-discrimination clauses in trade agreements do not undermine the possibilities to pursue fundamental principles for an equitable information society through public procurement. With the public sector as largest ICT consumer in most countries, public procurement represents perhaps the most effective policy tool to promote distributive justice by design in an industry prone to concentration due to network and scale effects;
- Recognize the legitimacy of national and thus differential IP rule-systems attuned to the respective development levels of a country;
- Avoid an unfair stigmatization of copying in developing countries as piracy and recognize the welfare gains accruing from the nonrivalrous nature of software products.

With regard to the procedural framework for negotiating global IP rules a number of steps could be taken to level the playing field somewhat and approximate conditions of informed and free choice. Here are three examples:

- With regard to the decision making process: recognize the asymmetric representation of public interest stakeholders in the IP policy-making process due to the various organizational and systemic difficulties outlined earlier. On basis of that enhance the interfaces between policy-makers and civil society input in this area;¹⁶¹
- With regard to the mandate of multilateral entities: Review the public education role of WIPO and the WTO Secretariat and undertake institutional reforms as to make their research outputs and education campaigns more responsive to a differentiated and balanced view of IP and development;
- With regard to industrialized countries: abstain from strong-arm tactics in the bargaining process and shed the moral pretense about dealing with theft, where more sincerely the expansion of rent-extraction is at stake despite opportunities for positive-sum welfare gains in developing countries.

In sum, what is necessary to make digital IP rules work for distributive justice is no more than a fundamental re-evaluation of the way we think about the relation between property and intellectual artifacts. This is a tall order. But as this paper has attempted to show, the seeds of

¹⁶¹ The expert Commission on Intellectual Property Rights established by the UK Department for International Development provides a laudable example. It has established a public consultation and networking infrastructure for IP in development issues, but was unfortunately disbanded upon delivery of its final report (see www.iprcommission.org).

change are already sprouting. Linking these emerging yet fragmented approaches, at the conceptual, empirical and practical level requires itself a paradigmatic vision and a role model for how broad-scale value changes can be brought about. The environmental movement might provide just that. It managed to unite a wide variety of dispersed interests for a common cause. But more importantly, it forged a shared belief system and a public vision that has changed how we relate to our physical environment. Why shouldn't a similar reorientation be possible with regard to our intellectual environment?

As emphatically outlined by one of the most distinguished legal observers in the field: what is called for is no less than a "*New Environmentalism for the Net*"¹⁶². And now is the right time for it.

¹⁶² See Boyle, 1997.

VI. References

- Aharonian, G. (2002): "Patnews: Software/Hardware Patent Quality Still Slowly Dropping", February 06, 2002.
- Aidt, T. (2000): "Welfare Economics and Economic Policy, Introduction to Microeconomics 1", Lecture Note 4, Michelmas 2000, Cambridge University (www.econ.cam.ac.uk/faculty/aidt/micro.htm).
- Allison, J. and Lemley, M. (2000): "Who's Patenting What; An Empirical Exploration of Patent Prosecution", UC Berkeley Public Law and Legal Theory Working Paper, No. 19.
- Arrow, K. (1962): "Economic Welfare and the Allocation of Resources for Inventions", in: Nelson, R. (ed.): "The Rate and Direction of Inventive Activity", Princeton: University Press.
- Balkin, J. (2003): "The Proliferation of Legal Truth", Research Paper No. 38, Public Law & Legal Theory Research Paper Series, Yale Law School.
- Bakos, Y.; Brynjolfsson, E. et al. (1999): "Shared Information Goods", University of Chicago Law and Economic Working Paper No. 67 (2nd series).
- Bechthold, S. (2002): "Vom Urheber- zum Informationsrecht - Implikationen des Digital Rights Management", Munich: C.H.Beck.
- Bell, D. (1976): "The Coming of Post-Industrial Society. A Venture in Social Forecasting", New York: Basic Books. (first published 1973).
- Benkler, Y. (2000): "An Unhurried View of Private Ordering in Information Transactions", in: Vanderbilt Law Review, Vol. 53, No. 6, pp. 2063-2080.
- Bessen, J. and Maskin, E. (1997): Intellectual Property on the Internet. What's Wrong with Conventional Wisdom?, draft paper presented at Conference on Internet Publishing and Beyond. The Economics of Digital Information and Intellectual Property, organised by Harvard Information Infrastructure Project, January 23-25, 1997, Cambridge MA (<http://ksgwww.harvard.edu/iip/econ/bessen.html>).
- Beveridge, M. (2003): "The Ptolemy Project: Delivering Electronic Health Information in East Africa", presentation for UNESCO symposium "Open Access and the Public Domain in Digital Data and Information for Science", Paris, March 11-13, 2003.
- Boldrin, M. and Levine, D. (2002): "The Case Against Intellectual Property", in: American Economic Review, Vol. 92, No. 2, pp. 209-212.
- Borensztein, E.; De Gregorio, J.; Lee, J.-W. (1998): "How does foreign direct investment affect economic growth?", in: Journal of International Economics, Vol. 45, pp. 115-135.
- Boyle, J. (2000): "Cruel, Mean or Lavish? Economic Analysis, Price Discrimination and Digital Intellectual Property", in: Vanderbilt Law Review, Vol. 53, No. 6, pp. 2007-2039.
- Boyle, J. (1997): "A Politics of Intellectual Property: Environmentalism for the Net?", in: Duke Law Journal, Vol. 47, pp. 100-107.
- Boyle, J. (1996): "Shamans, Software, and Spleens: Law and the Construction of the Information Society", Cambridge: Harvard University Press.
- Carlton, D. and Gertner, R. (2002): "Intellectual Property, Antitrust and Strategic Behavior", NBER Working Paper 8976.
- Castells, M. (1996): "The Rise of the Network Society", Oxford: Blackwell.

- Chadwick, A. and May, Ch. (2003): "Interaction between States and Citizens in the Age of the Internet. E-Government in the United States, Britain and the European Union", in: *Governance*, Vol. 16, No. 2.
- Chang, H-J. (2001): "Intellectual Property Rights and Economic Development - Historical Lessons and Emerging Issues", *Journal of Human Development*, Vol. 2, No. 2.
- Chapman, A. (2002): "The Human Rights Implications of Intellectual Property Protection", in: *Journal of International Economic Law*, Vol. 5, No. 4, pp. 861-882.
- Cohen, J. (2001): "Information Rights and Intellectual Freedom", in: Vedder, A. (ed.): "Ethics and the Internet", Antwerp: Intersentia, pp. 11-32.
- Cohen, J. (2000): "Copyright and the Perfect Curve", in: *Vanderbilt Law Review*, Vol. 53, No. 6, pp. 1799-1819.
- Cohen, J. (1998): "Lochner in Cyberspace: The New Economic Orthodoxy of Rights Management", in: *Michigan Law Review*, Vol. 97 (462).
- Cohen, J. and Lemley, M. (2001): "Patent Scope and Innovation in the Software Industry", in: *California Law Review*, Vol. 89, No. 1.
- Cohen, W. and Nelson, R. et al. (2000): "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)", NBER Working Paper W7552.
- Colorado State University (no date): "Transgenic Crops. An Introduction and Resource Guide" (www.colostate.edu/lifesciences/TransgenicCrops/index.html).
- Coombs, R. (1998): "The Cultural Life of Intellectual Properties", Durham: Duke University Press.
- Covelli, N. (2001): "The Need for Adequate Global Standards of Protection for Electronic Commerce Related Intellectual Property Rights", in: *International Trade Law & Regulation*, Vol. 7, No. 2, pp. 23-25.
- David, P. (2000): "A Tragedy of the Public Commons? Global Science, Intellectual Property and the Digital Technology Boomerang", unpublished paper (<http://www.oiprc.ox.ac.uk/EJWP0400.pdf>).
- Davidson, A. and Morris, J. (2003): "The Evolving Landscape for Internet Policymaking: Internet Time and Internet Place?", Submission to the January 29, 2003 Workshop on Connecting Research and Policy in the Digital Economy.
- Deardorff, A. (1992): "Welfare Effects of Global Patent Protection", in: *Economica*, Vol. 59, pp. 35-51.
- Depoorter, B. and Parisi, F. (2001): "Fair Use and Copyright Protection: A Price Theory Explanation" SSRN Working Paper, No. 327.
- Digital Opportunity Task Force (2001): Report of the DOT Force, May 11, 2001 (www.dotforce.org/reports/DOT_Force_Report_V_5.0h.html)
- Drahos, P. (2002): "Developing Countries and International Intellectual Property Standard-Setting", Study Paper 8, Commission on Intellectual Property Rights, London.
- Dusolier, S. (2003): "Fair Use by Design in the European Copyright Directive of 2001", in: *Communications of the ACM*, Vol. 46, No. 4, pp. 51-55.
- Erickson, J. (2003): "Fair Use, DRM, and Trusted Computing", in: *Communications of the ACM*, Vol. 46, No. 4, April 2003, pp. 34-39.

- Fisher, W. (1998): Theories of Intellectual Property, draft of 30.11.98 (<http://eon.law.harvard.edu/property/iptheory.html>).
- Fisher, W. (1999): The Growth of Intellectual Property. A History of Ownership of Ideas in the United States (<http://eon.law.harvard.edu/property/history.html>).
- Freeman, Ch. (1995): "The National System of Innovation in Historical Perspective", in: Cambridge Journal of Economics, Vol. 19, pp. 5-24.
- G8 (2000): "Okinawa Charter on the Global Information Society", July 2000 (www.dotforce.org/reports/it1.htm)
- Garzarelli, G. (2002): "Open Source Software and the Economics of Organization", draft, University of Rome.
- Glass, A. and Saggi, K. (2002): "Intellectual Property Rights and Foreign Direct Investment", in: Journal of International Economics, Vol. 56, pp. 387-410.
- Gereffi, G. (2001): "Beyond the Producer-driven/Buyer-driven Dichotomy: The Evolution of Global Value Chains in the Internet Era", IDS Bulletin 32, 3 (July), pp. 30-40.
- Gervais, D. (1999): "Electronic Rights Management and Digital Identifier Systems", in: Journal of Electronic Publishing, Vol. 4, No. 3.
- Ginsparg, P. (2001): "Creating a Global Knowledge Network", invited contribution for UNESCO conference, Paris, February 19-23, 2001 (<http://arxiv.org/blurb/pg01unesco.html>).
- Grossman, G. and Lai, E. (2002): "International Protection of Intellectual Property", National Bureau of Economic Research, Working Paper 8704.
- Hart, D. (2002): "Political Representation Among Dominant Firms: Revisiting the Olsonian Hypothesis", Research Working Paper 02-045, Kennedy School of Government, Harvard University.
- Hamelink, C. (1994): The Politics of World Communication. A Human Rights Perspective, London: SAGE Publications.
- Heller, M (1998): "The Tragedy of the Anticommons: Property in the Transition from Marx to Markets", in: Harvard Law Review, Vol. 111, pp. 621-688.
- Helpman, E. (1993): "Innovation, Imitation, and Intellectual Property Rights", in: Econometrica, Vol. 61, No. 6, pp. 1247-1280.
- Holderness, M. (1998): "Moral Rights and Authors' Rights: The Keys to the Information Age", in: Journal of Information, Law and Technology, No. 1.
- Hughenoltz, B. (2001): "The New Database Right: Early Case Law from Europe", paper presented at Ninth Annual Conference on International IP Law & Policy, Fordham University School of Law, New York, 19-20 April 2001.
- Hughes, J. (2002): "Political Economies of Harmonization: Database Protection and Information Patents", Cardozo Law School, Research Paper No. 47.
- Human Development Report (2001): "Making New Technologies Work for Human Development", New York: UNDP.
- Humphrey, J., Mansell, R. et al. (2003): "The Reality of E-commerce with Developing Countries", Research Monograph, Institute for Development Studies, University of Sussex (www.gapresearch.org/production/Report.pdf).

- Iannella, R. (2001): "Digital Rights Management Architectures", in: D-Lib Magazine, Vol. 7, No. 6.
- IDC (2003): "Expanding Global Economies: The Benefits of Reducing Software Piracy", report commissioned by Business Software Alliance.
- IIPA (International Intellectual Property Alliance) (2003): "Special 301 Recommendations: Estimated Trade Losses Due to Copyright Piracy", February, 14, 2003.
- Jenkins, H. (2000): "Viewpoint: Digital Land Grab. Media Corporations are Stealing Our Cultural Heritage", in: Technology Review, March/April 2000.
- Jensen, M. (2003): "Another Loss in the Privatisation War: PubScience", in: The Lancet, Vol. 361, January 25, 2003, p. 274.
- Kahin, B. (2002): "Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy", Expert Statement, US Federal Trade Commission, March 19, 2002.
- Kaplinski, R. and Morris, M. (2001): "A Handbook for Value Chain Research", Ottawa:IDRC.
- Kanwar, S. and Evenson, R. (2001): "Does Intellectual Property Protection Spur Technological Change?", Yale University Economic Growth Center, Discussion Paper, No. 831.
- Kumar, N. (2002): "Intellectual Property Rights, Technology and Economic Development: Experiences of Asian Countries", Study Paper 1b, Commission on Intellectual Property Rights, London.
- Kumar, N. (1996): "Intellectual Property Protection, Market Orientation and Location of Overseas R&D Activities by Multinational Enterprises", in: World Development, Vol. 24, No. 4, pp. 673-688.
- Lanjouw, J. and Schankerman, M. (2001): "Enforcing Intellectual Property Rights", NBER Working Paper 8656.
- Lemley, M. (2002): "Intellectual Property Rights and Standard Setting Organizations", UC Berkeley School of Law, Research Paper No. 84.
- Lerner, J. (2002): "The Patent System and Competition", Expert Statement, , US Federal Trade Commission, March 19, 2002
- Lessig, L. (2002): "Keynote Address, Open Source Convention (OSCON), San Diego, July 24, 2002.
- Lessig, L. (1999a): Open Code and Open Society. Values of Internet Governance v4.0, Sibley Lecture, University of Georgia 2/99.
- Lessig, L. (1999b): Code and Other Laws of Cyberspace, New York: Basic Books.
- Maskus, K. (2000): "Intellectual Property Rights in the Global Economy", Washington DC: Institute for International Economics.
- Mansfield, E. (1994): "Intellectual Property Protection, Foreign Direct Investment and Technology Transfer", IFC Discussion Paper No. 19.
- Mansell, R. and When, U. (1998): "Knowledge Societies. Information Technologies for Sustainable Development", Oxford: University Press.

- Maurer, S., Hugenholtz, B. et al. (2001): "Europe's Database Experiment", in: *Science*, Vol. 294, October 26, 2001, pp. 789-790.
- McCalman, Ph. (1999): "Reaping What You Sow: An Empirical Analysis of International Patent Harmonization", in: *Journal of International Economics*, Vol. 55, pp. 161-186.
- McIver, W. (2000): *Access to Cyberspace as a Human Right. Universal Service and the Human Right to Communicate*, paper presented at Conference *Shaping the Network Society. The Future of the Public Sphere in Cyberspace (DIAC2000)*, organised by Computer Professionals for Social Responsibility, May 20-23, 2000, Seattle, U.S.
- McTaggart, C. (1999): *Governance of the Internet's Infrastructure. Network Policy for the Global Public Network*, Dissertation (LLM), University of Toronto, Canada.
- Merges, R. (2000): "Who Owns the Charles River Bridge? Intellectual Property and Competition in the Software Industry" SSRN Working Paper (www.ssrn.com).
- Merges, R. (1999): "As Many as Six Impossible Patents Before Breakfast: Property Rights for Business Concepts and Patent System Reform", SSRN Working Paper (www.ssrn.com).
- Merges, R. (1997): "The End of Friction? Property Rights and Contract in the Newtonian World of On-Line Commerce", in: *Berkeley Technology Law Journal* 115.
- Mazzoleni, R. and Nelson, R. (1998): "The Benefits and Costs of Strong Patent Protection: A Contribution to the Current Debate", in: *Research Policy*, No. 27, pp. 273-284.
- Merges, R. and Nelson, R. (1990): "On the Complex Economics of Patent Scope", in: *Columbia Law Review*, Vol. 90.
- Moglen, E. (1999): "Anarchism Triumphant: Free Software and the Death of Copyright", in: *Firstmonday*, Vol. 4, No. 8.
- Mueller, M. (2002): *Ruling the Root: Internet Governance and the Taming of Cyberspace*, Cambridge: MIT Press.
- Newmann, J. (1999): "New Lyrics for an Old Melody: The Ideas/Expression Dichotomy in the Computer Age", in: *Cardozo Arts & Entertainment Law Journal*, Vol. 17.
- Nordhaus, W. (1969): *Invention, Growth and Welfare*, Cambridge: MIT Press.
- Norris, P. (2001): *Digital Divide? Civic Engagement, Information Poverty and the Internet Worldwide*, Cambridge: University Press.
- Nunziato, D. (2001): "Intergenerational Justice Between Authors in the Digital Age", Public Law and Legal Theory Working Paper No. 32, George Washington University Law School.
- OECD (2002): *Measuring the Information Economy*, Paris: OECD.
- Pagano, U. (2002): "Legal Positions and Institutional Complementarities", in: *Universita degli Studi di Siena, Quaderni*, No. 360.
- Parisi, F., Schulz, N. et al. (2000): "Duality in Property: Commons and Anticommons", *Wuerzburg Economic Papers*, No. 21, May 2000.
- Press, E. and Washburn, J. (2000): "The Kept University", in: *Atlantic Monthly*, March 2000.
- Quah, D. (1999): "The Weightless Economy in Economic Development", Discussion Paper No. 417 March 1999, Center for Economic Performance, London School of Economics, London, UK

Quah, D. (2002): "24/7 Competitive Innovation", CEP Working Paper #1218, London: London School of Economics.

Radin, M. (2002): "Information Tangibility", Stanford Public Law and Legal Theory Research Paper Series, No. 48, December 2002.

Reichman, J. and Lange, D. (1998): "Bargaining Around the TRIPS Agreement: The Case for Ongoing Public/Private Initiatives to Facilitate World-Wide Intellectual Property Transactions", in: Duke Journal of Comparative and International Law, Vol. 11.

Rifkin, J. (2000): "The Age of Access, The New Culture of Hypercapitalism: Where All of Life is Paid-for Experience", New York: Tarcher/Putnam.

Romer, P. (1990): "Endogenous Technological Change", in: Journal of Political Economy, Vol. 98, No. 5, pp. 71-102.

Rorty, R. (1988): "Unger Castoriadis and the Romance of a National Future", in: Northwestern University Law Review, Winter 1998.

Rose, C. (1998): Cannons of Property Talk, or, Blackstone's Anxiety, in: Yale Law Journal, Vol. 108, pp. 601-632.

Samuelson, P. (2003): "DRM {And, Or, Vs.} The Law", in: Communications of the ACM, Vol. 46, No. 4, April 2003, pp. 41-45.

Samuelson, P. and Opsahl, K. (1999): "Licensing Information in the Global Information Market: Freedom of Contract Meets Public Policy", in: European Intellectual Property, 387.

Schiller, D. (1999): Digital Capitalism: Networking the Global Market System, Cambridge MA: MIT Press.

Schweik, Ch. (2003): "The Open Source Paradigm and the Production of Scientific Information: A Future Vision and Implications for Developing Countries" presentation for UNESCO symposium "Open Access and the Public Domain in Digital Data and Information for Science", Paris, March 11-13, 2003.

Shadlen, K. (2001): "Beyond the Battle in Seattle: International Economic Governance and the North-South Conflict Over Intellectual Property Rights", paper presented at the Annual Meeting of the American Political Science Association, San Francisco, August 3—September 2, 2001.

Shapiro, C. and Varian, H. (1998): "Information Rules: A Strategic Guide to the Network Economy", Cambridge: Harvard Business School Press.

Shulman, S. (2000): Software Patents Tangle the Web, in: Technology Review, March/April 2000 (<http://www.techreview.com/articles/ma00/shulman.htm>).

Singer, J. (2000): "Entitlement: The Paradoxes of Property", New Haven: Yale University Press.

Stefik, M. (1997): "Trusted Systems", in: Scientific American, 276(3).

Steinberg, R. (2002): "In the Shadow of Law or Power? Consensus-Based Bargaining and Outcomes in the GATT/WTO", in: International Organization, Vol. 56, No. 2, pp. 339-374.

Stern, R. (1999): "Scope-of-Protection Problem with Patents and Copyrights on Methods of Doing Business", in: Fordham Intellectual Property, Media and Entertainment Law Journal, Vol. 10.

South-African Development Community (2002): "SADC E-Readiness Review and Strategy: Recommendations of the SADC e-Readiness Task Force", June 2002.

Weber, S. (2003): "Open Source Software in Developing Countries", Background Paper, Social Science Research Council
(http://www.ssrc.org/programs/itic/publications/ITST_materials/webernote2.pdf).

Weber, S. (2000): "The Political Economy of Open Source Software", BRIE Working Paper 140, University of Berkeley.

WIPO (2002): "Intellectual Property on the Internet: A Survey of Issues", WIPO/INT/02
(ecommerce.wipo.int/survey/html/5.html).

Worldbank (2000): "The Network Revolution and the Developing World", Analysis Report for Worldbank Infodev Programme.

Worldbank (2002a): "Global Economic Prospects and the Developing Countries", Washington DC: Worldbank.

Worldbank (2002b): World Development Indicators

Wouters, P. and Schroeder P. (2002): "The Public Domain of Digital Research Data", Amsterdam: NIWI-KNAW.

VII. Annex

Annex 1: IP and FDI

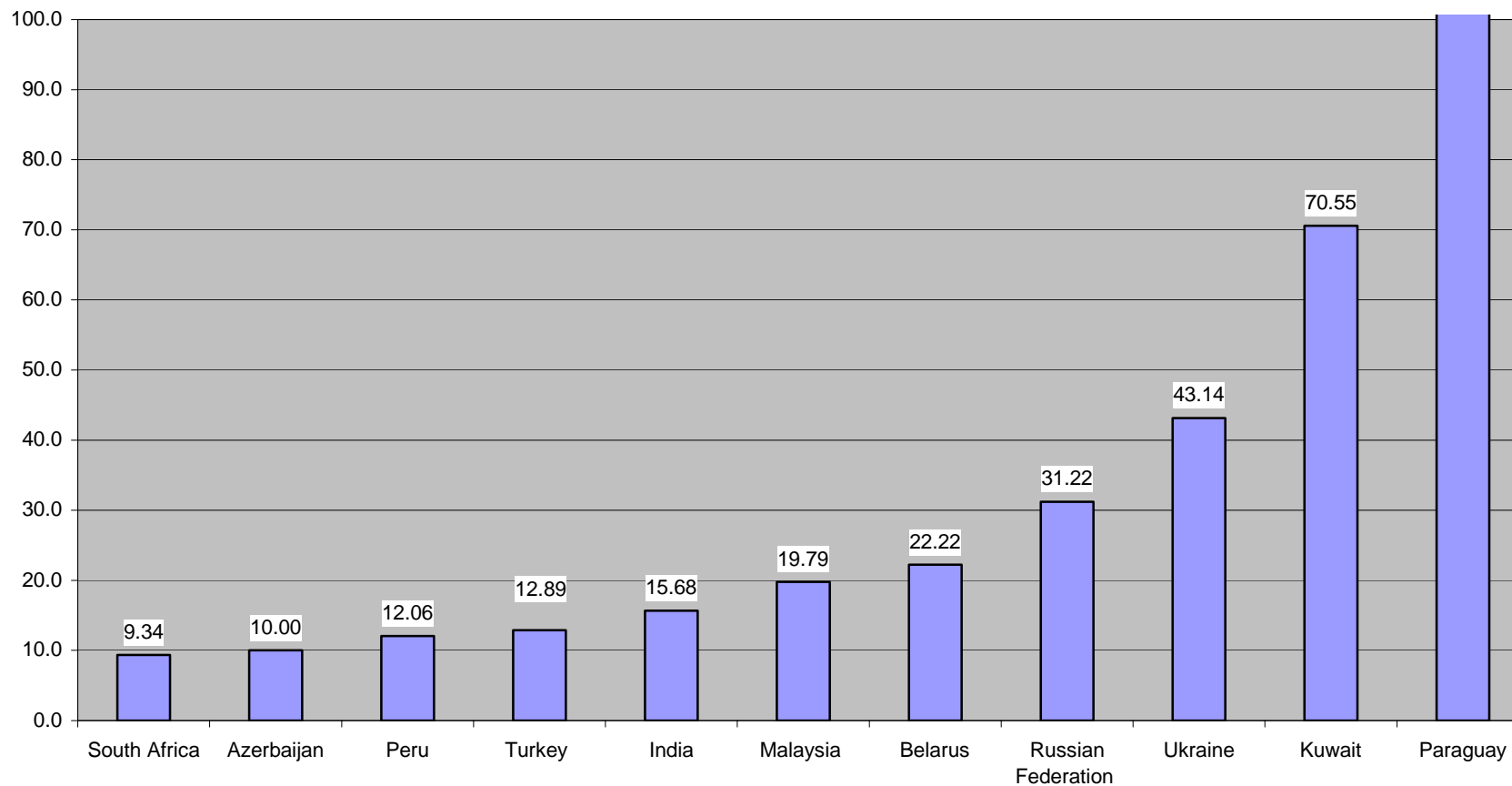
Annex 2: IP and ODA

Annex 3: IP and investment

Annex 1: IP and FDI (Sources: Worldbank 2002;IIPA, 2003)

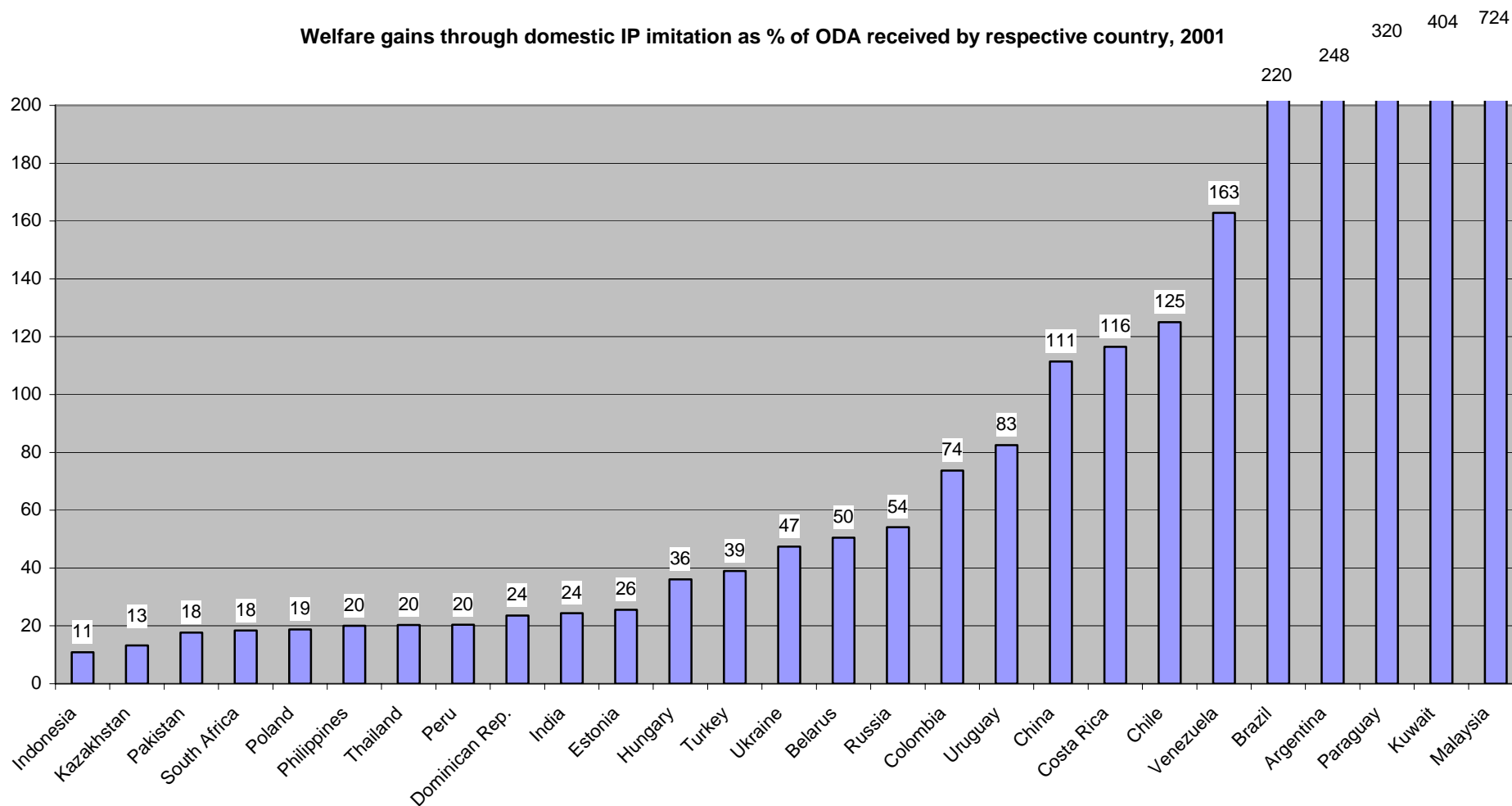
Welfare gains through domestic IP imitation as % of net FDI inflows for respective country, 2001

320.42



Annex 2: IP and ODA (Sources: Worldbank 2002;IIPA, 2003)

Welfare gains through domestic IP imitation as % of ODA received by respective country, 2001



Annex 3: IP and investment (sources: Worldbank 2002;IIPA, 2003)

