

The weightless economy: Property

by

Danny T. Quah

CEP and Economics Department LSE

D.Quah@lse.ac.uk

<http://econ.lse.ac.uk/~dquah/>

December 1998

Property rights underly the workings of almost all economic life. In the weightless economy, however, property is intellectual property—not the same as scientific knowledge, perhaps, but intellectual property nonetheless, in having all the same physical and economic properties as knowledge. What difference does this make to economic performance? Danny Tyson Quah asserts the changes will be large, and lays out some of the economic reasoning underlying decisions that societies will need to make.

In almost every area of economic activity, being clear on who owns what is a pretty effective way to guarantee reasonable outcomes. Property rights provide appropriate incentives for ensuring the continued production and distribution of goods and services that society values. Indeed, some identify the mainspring of economic growth to be property rights making socially productive activity worthwhile.

Less grandiose examples abound. Those owning their own homes maintain the property better than those renting a hotel room; those driving their own cars take better care than when driving a rental. When employees run the business—whether it is the John Lewis chain or a family-run corner shop—chances are they will have the greater incentive to make the business succeed, by working harder or being more ingenious at solving the day-to-day problems that come up. Shirking is reduced; gains and losses are made transparent.

The logic extends generally. Households that form part of a coherent community watch out for the well-being of everyone in the community. Engineers with stock options in a software company are driven to work hundreds of hours a week to guarantee delivery of a successful product. Firms and workers that have a stake in society are

supposed to be goaded to perform better all around—refrain from littering city streets; contribute charitably to the museums, opera, and ballet; shrug off the coming on of road rage. (Here, the notion of ownership is reflexive—the community *owns* the household, but it’s just as good as the other way around.)

This alignment of actions and incentives makes so much sense that it pervades thinking even where its utility might be less clearcut. Slap the word *intellectual* in front of *property rights*: why should anything change?

Intellectual property rights (IPRs) increasingly form the touchstone of success in the weightless economy. IPR activity here ranges from the grab for namespace on the World Wide Web to US TRIPS (Trade-Related aspects of Intellectual Property RightS) litigation to the software industry’s estimated worldwide loss of US\$11.4 billion in 1997 from illegal software copying. While US retailing loses less than 2% of total sales from shoplifting, bootlegged business software in the US alone costs that industry over 25% of sales. Estimated illegal copies as a fraction of total installed rise to 32% in Japan and 96% in China (making for dollar losses of US\$0.8 billion and US\$1.4 billion, respectively, in 1997). Because the music industry fears its sales of US\$38 billion are threatened by Internet pirate downloading—coupled with a rapidly-developing technology that allows CD-quality sound despite audio compression over Internet cabling onto computer hard disks—when the Beastie Boys released their music on MP3 format, it made the front page of the Wall Street Journal. (Beastie Boys: who they? I’m revealing my age)

Two forces are at work here. First, it is the nature of weightless economy products that they can be easily copied. But copying alone need not be enough. Having a copy of the music, video, or electronic game on disk without being able to use it doesn’t do the consumer much good (and there are many more consumers than there are businesses). So, the second: Technology now facilitates the consumption and use of weightless-economy products to a degree where their easy copying actually makes a perceptible economic difference.

The end result is as Thomas Jefferson two centuries ago saw, not of computer software or Beastie Boys music, but of knowledge and ideas:

that they are “incapable of confinement or exclusive appropriation”, or are infinitely expansible—the classical IPR problem. But while Thomas Jefferson and earlier writers could confine these worries to the relatively remote realms of first, the amateur muddler-through tinkerer and downhome inventor, later to factory-floor innovation, and much later to R&D labs, the weightless economy takes them directly to the consumer. It might irk purists that I say the Beastie Boys and the Spice Girls generate intellectual property, but it’s true—in that their weightless-economy output has all the same physical and economic properties as does scientific knowledge. Similarly, computer software, video games, movies.

The IPR problem is therefore intensified in the weightless economy. With intellectual property rights at best insecure (by technological developments), what remains of incentive to develop and maintain intellectual assets? Proponents for stronger IPR regimes go further: for them, the current system not just destroys the will to innovate, it also reduces R&D resources overall and depletes tax revenues. These arguments make their case on behalf of gains for society as a whole. But narrower, less altruistic ones can be developed. If the British medical establishment is averse on grounds of “morality” to patenting its discoveries, then American business is more than willing to do so. Perversely, we then end up paying to use something that was ours in the first place.

1 Property tradeoff

Whether or not morality means anything, certain types of intellectual property do differ from property more generally.

To decide if society enjoys enough economic activity of a particular kind, we weigh up marginal benefits and marginal costs. When the former exceeds the latter, society will gain when there is more of the activity in question. We can apply this principle to agricultural production, the manufacturing sector, the Spice Girls, . . . , even the number of academics working in economics departments. For infinitely expansible intellectual property, marginal costs are zero ex-post, i.e., after the first instance of that asset already exists. But

then as long as society continues to benefit from having yet another copy of that asset, we should instruct the owners of an intellectual asset to flood the market with their asset at zero price.

Wholesale expropriation is one way to describe this, but unfettered competition would work too. The different phrases, of course, give entirely different spins on, in this case, exactly the same outcome.

(The description just given is not a rationale for illegal smuggling, bootlegging, and software piracy. It is, indeed, the same economic reasoning that when applied to a profit-seeking private purveyor of fiduciary currency drives an economy towards an undesirable paper standard, and according to Milton Friedman, compels a government to provide a monetary framework for commerce. Friedman, most assuredly, did not have in mind currency counterfeiting when he discussed this problem in *A Program for Monetary Stability*.)

The obvious problem arises once one thinks through the dynamics. Forward-looking putative creators of intellectual assets see that expropriation is what will happen, and, sensibly enough, demure. What is good for society ex-post is not similarly so for the individual ex-ante. Creative people will find plenty of other uses for their time and energy. The result: No intellectual assets are produced.

To get around this, systems of intellectual property rights prevent unfettered competition by awarding a monopoly to the private creator of an intellectual asset. Any effective IPR system necessarily reflects a choice society has made about the tradeoff between ex-ante incentives and ex-post inefficiencies. Those arguing for strong IPR protection must estimate ex-post inefficiencies to be relatively unimportant; those agitating for weak IPR protection must believe ex-ante incentives will be relatively undiminished. Unlike property rights in many other areas of economic life, intellectual property rights are not an unalloyed good thing.

While following trivially from the earlier reasoning, this observation has unexpected implications. For one, it lends circumspection to policy-makers' using patent counts and copyright licensing revenues to measure economic performance. Observed patterns of patent renewals and patent/R&D expenditure ratios could well give insight on how valuable and effective intellectual property and R&D are to

an *individual* firm. They necessarily give no insight, however, on national economic performance: are consumer and producer welfare jointly maximized? In the reasoning above, higher patent counts simply mean ever greater social inefficiencies, and thus reduced consumer surplus.

Almost by definition, then, there cannot be one absolutely convincing to everyone, scorched-earth take-no-prisoners, unambiguous and definitive argument for strengthening regimes for protecting intellectual property rights. Or for weakening them.

2 Intellectual property in the real world: Copyrights and patents

Reasoning based on logic alone only goes so far. To make progress, we need to look at specifics.

Most official intellectual property takes the form of copyright and patents. (Trademarks, registered designs, and design rights too are legally taken as intellectual property. And, not covered by the law, we have trade secrets, lead time, specialized sales and service, and others more difficult to recognize as property—but that nevertheless firms report as important ways to protect their intellectual assets). Software has, historically, been protected by copyright, not patent. Software is, therefore, legally the same as a literary work. Copyright protects an author’s expression of an underlying set of ideas, but not the ideas themselves. Under most current legal systems, copyright is routinely awarded to any work showing originality, i.e., the work must not have been copied, and must have had sufficient amount of labor, skill, and judgement involved in its production. Put differently, the work must have been the author’s own creation.

Implicit in this is the understanding that there must be more than one way to implement an idea—for otherwise any copyrighted work could not have been the author’s own creation. Indeed, under copyright, others can freely copy portions of a work that are “critical”, i.e., for which only one way exists to implement the idea. In principle then, except through sheer bulk of overlaying detail, good ideas do not get held up by copyright monopoly.

Easy enough for me to say lightly. But Hollywood and the publishing, arts, and software industries on the one hand and consumer advocates on the other take copyright protection very seriously indeed. To the degree that economic growth continues to be driven by technology—as it always has been—and to the extent that new technology more and more appears in copyrighted (not patented) software, ordinary copyright protection might not be strong enough for society’s own good.

Or too strong, depending on how you look at it. Consumers are not concerned the same way rival producers are about being able to extract, for their own use, the critical good idea embedded in a copyright work but unprotected by law. (And even this is contentious: decompiling a software program to see the critical idea—who decides when a particular trick is critical anyway—is almost certainly illegal.) Consumers just want to enjoy the entire work conveniently, without inadvertently violating the law’s fair-use provisions by, say, viewing the work in a computer’s volatile random access memory. This act is impossible to perform without, in effect, making a copy—albeit temporarily—and thus infringing the rights of reproduction on a copyright work.

On a different front, user interface copyright proliferates the multiplicity of computer environments—keystrokes, commands, mouse actions—that already suspicious consumers have to learn and re-learn, increasing gratuitous incompatibility and lowering user productivity.

Patents differ from copyright in requiring that an invention be novel, capable of industrial application, and innovative relative to the current state of the art; they are therefore a stronger form of intellectual property protection than copyright. The definition seems to exclude, say, mathematical formulas and abstract models, and as already said above, computer software historically. (The UK Patent Act of 1977 explicitly rules out computer programmes.)

But underlying bases for legal decisions can drift as understanding changes, even when sometimes the resulting economic benefits might not be completely transparent. By the late 1980s, the Kar-makar linear programming algorithm had become, in effect, pro-

tected by patent. In 1998 the US Patent and Trademark Office began awarding patents for electronic-commerce business models—Open Market’s Internet marketing and payments system; Cyber-Gold’s attention-brokerage scheme; Priceline.com’s buyer-driven, reverse auction model; Juno Online Services’s advertisement-display techniques—reasoning they were performed on computers, and thus were industrial, machine-driven processes. Indeed, a recent decision awarded a patent to, essentially, a mathematical formula for dividing up administrative costs on a portfolio of mutual funds. Because the formula was computerized—the computer was made part of the invention—and since US law allows patenting of the entire package, a mathematical idea has in effect been accorded patent protection.

3 The bottom line

With ongoing progress in Internet delivery and weightless economy technology, it becomes increasingly important to understand how systems of intellectual property rights affect economic performance. I have here touched on only the most basic of economic issues, but ones that often seem forgotten in the rush to digest a morass of IPR detail.

The notion of intellectual property protection has always been slippery, and will likely become still more so. However, without appreciating its proper role in the workings of an economy, we are left with little but post-modernist deconstruction of fun, altruism, and identity in an electronic community. Or, at the other extreme, we get mindless parroting of simplistic economic cliches. Neither mushiness seems to me the right way to go about building a modern economy.

Danny Tyson Quah is Director of the CEP’s Technology and Growth Programme and Professor of Economics at the London School of Economics.

<http://econ.lse.ac.uk/~dqah>

2182 words