

Monopoly Power in the Electronic Information Industry:

Why, and So What?

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The Electronic Information Industry ["the Industry"] grew from an infant into an economic giant over the 20th Century but suffers today from twin signs of maturity – a deep recession and pronounced symptoms of monopoly power.¹ The recession will pass, and the Industry will remain central to all developed economies. But monopoly power does not self-cure in cycles.

This survey article asks why the Industry has spawned monopoly power in so many of its markets and what, if anything, public policy should do about it.

These questions open issues as sprawling and intricate as the Industry itself. This survey necessarily resorts to gross simplifications: the devil here often lurks in the details, but I must usually leave him there, unattended. I have also had to rely too often on mere impressions from long toiling in the Industry: monopoly power is well-understood conceptually but has rarely, in this or any other industry, been subjected to rigorous empirical study.

1. The Industry and its products became major factors in the US economy over the 20th century – and a central cause of the late century boom in GDP and the subsequent stalling of the entire national economy. In 1900 the Information consisted only of telegraphy and the beginnings of local telephone services. By 2001, the Industry had mushroomed so that, in the U.S. alone, the gross domestic product for that year contributed by economic segments substantially or entirely subsumed within this Industry were:

- Telephone and telegraph services: \$218.5 billion
- Radio, television, and motion pictures: \$108.4 billion
- Printing and publishing: \$100.2 billion
- Electronics and electrical equipment: \$161.2 billion

*See: Industry Accounts Data, Bureau of Economic Analysis (BEA), U.S. Department of Commerce, (annual GDP statistics accessible through <http://www.bea.doc.gov>. US gross private domestic investment in "equipment and software" climbed 16% from 1998 to 2000, from \$3275.5 billion to \$3806.3 billion, but then declined by 10% over the first two years of the 21st Century, falling to \$3392.6 billion. NIPA Data of the Bureau of Economic Analysis, tables of quarterly data findable at www.economagic.com/em-cgi/dta.exe/beana/t101/10. As defined by the Census Bureau, the "information industry" itself invested \$146.3 billion in non-structure capital equipment in 2001(out of an economy total of \$1.1 trillion). This represented a decline of 8.7% from the industry's 2000 investment level, which had by contrast grown 10.9% in 2000 and 7.8% in 1999. *See: Annual Capital Expenditures Survey: 2001, U.S. Census Bureau,* accessible through <http://www.census.gov/csd/ace-pdf.html>.*

To impose coherence on the survey, I have focused throughout on a single norm – "economic value added" (or, economic "efficiency"), as defined by neo-classical welfare economics.

The paper's chief conclusions are:

1. Though highly diverse, the Industry conducts throughout three basic activities or functions: authoring, publishing, and distributing.

2. The economics of these functions bear the strong influence of two peculiar phenomena:

- Information products are inherently "non-rivalrously sharable".
- Industry markets are highly vulnerable to "creative destruction".

Both of these phenomena are potential sources of enormous economic value.

3. Though monopoly power in the Industry sometimes arises from familiar mechanisms – e.g. superior performance by certain firms, horizontal combinations among firms, and scale economies – three less familiar mechanisms are often the source:

- Excessive government protection of intellectual property rights.
- Monopoly allocations of radio spectrum frequencies.
- The private use of "closed standards" to appropriate the network effects generated by a market.
- And the leveraging of monopoly power across market boundaries.

4. Government can best increase the economic value created by the Industry through five policy reforms:

- Reducing legal protection of intellectual property.
- Ceasing "over-enclosure" of the commons of the radio spectrum.
- Promoting "open standards".
- Exercising more anti-trust scrutiny of "nationalizing" mergers and acquisitions of regionally monopolized information distribution networks.
- Adopting simpler and tougher rules against the leveraging of monopoly power across markets.

Similar policy recommendations could emerge from consulting "non-economic" norms such as First Amendment values, concern for a diversity of editorial voices, or a simple bias toward creative ferment. This similarity of results suggests, perhaps, that the "law and economics" approach has now achieved more sophistication – or sheer ambiguity! – than its loudest proponents and detractors often acknowledge.

I. Symptoms of Monopoly Power

Even a quick scan of headlines reveals major symptoms of monopoly power in the Industry:²

- *Telecommunications services:*
 - Most local fixed-line systems remain total monopolies.
 - The eight Baby Bells have shrunk by merger to four (Verizon, SBC, Bell South, and Qwest), and each is pushing against waning regulatory resistance toward adding long distance service. This will likely shrink long distance providers to a small handful. Ma Bell is being resuscitated.
 - Cellular phone services are now down to two players in most national markets, and the US market is widely thought heading soon toward two or three.
 - Yesterday's flowering of multiple, entrepreneurial Internet Service Providers has withered away, and the reigning phone and cable giants are now clearly destined to dominate that business.

- *Cable TV systems:*
 - Nearly every locality and metropolitan region is served by a local monopoly.
 - At the US national level, two giant companies, Comcast and the Time Warner cable system, have grown to dominate the scene via multiple mergers. Similar consolidations are the rule in most other national markets.

- *Satellite TV systems:*
 - A single firm, News Corp., dominates this segment outside the US.
 - Two players, News Corp./Direct TV and Echostar, will soon likely remain to compete for the whole US market.

- *Content Media:*
 - Radio broadcasting is rapidly consolidating into a few national networks.
 - National TV broadcasting now numbers a small handful of networks in the US, fewer in other world markets.

² Aside from the general business media, no single periodical or website seeks to cover the business of the entire Industry. Its broad segments are regularly surveyed by such publications as: Infoworld Magazine and Computerworld magazines (computer hardware and software), Telecommunications magazine (telecommunications and data communications); Broadcast, Cablenews, and Multi-Channel News magazines (television); C-Net.com and Internet.com (the Internet and the World Wide Web); etc. Also, the Economist magazine fairly regularly publishes a well-written quarterly review of information technology developments and seeks to keep its weekly readers well abreast of major Industry news.

-- Cable program channels, while numerous, are clumping rapidly into a definite oligopoly structure for the most consequential channels.

-- Movies remain dominated by a few major "studios", acting as "mass marketers".

-- The "mass media" generally are huddled into several mega-conglomerates of national, and often global, scale. These conglomerates, in turn, are being forced or seduced into "vertical integration" with the already monopolizing distribution network providers who use the Industry's several major electronic distribution technologies.

- *"Software"*:

-- Microsoft is seeking, with considerable success, to leverage its monopolies in desktop operating systems and applications software into similar dominance in every market even remotely "related" to those products – from server operating systems, database management systems, and business applications software, through operating systems for PDA's, cell phones, video game boxes, and cable set-top boxes, to web portals and every conceivable web application, web portals, and indeed the entire architecture for so-called "web services".

-- Currently, relational database management software is dominated by Oracle, IBM, and Microsoft, and enterprise-wide business application software by SAP, Oracle, and Peoplesoft.

- *"Hardware"*:

-- Intel dominates the world microprocessor industry.

-- Computer systems markets are dominated by IBM (in mainframes) and Dell (in PC based computers).

-- Big communications systems markets are dominated by Cisco, Lucent, and Nortel.

To diagnose the sources of these several market-concentrating trends, and the economic ailments they may cause, it is first necessary to sketch out a taxonomy for the Industry and then to survey briefly the conceptual tools available to analyze the "welfare economics" of monopoly power.

II. Industry Taxonomy

The Information Industry is a vast organism of diverse parts -- products, services, and markets -- with no widely-recognized outer boundaries or interior segments. I will try to make do with a very simple map.

While including within the "Industry" the usual trio of "communications, media, and technology", I will focus on their "electronic" manifestations. These arose first with

telegraphy in the 19th Century, spread into telephony, movies, radio, and TV in the first half of the 20th Century, and have since World War II sprouted in all directions from the revolution in digital computation and communications.

I will define as an "**information product**" any good (*or* service) that consists at core of an intangible, deliberately-ordered set of data meant to inform, communicate, entertain, or educate, or directly to facilitate these objectives. Such products are often temporarily embedded in some "tangible" packaging for convenient storage, delivery or actual use (e.g. print on paper, a floppy disc, a hard drive, a flickering monitor, etc). I will *exclude* from the Industry products which, though increasingly "information rich", are meant for some purpose other than communicating, informing, educating, or entertaining, e.g. cars, airplanes, pharmaceuticals, factory robots, microwave ovens, genetically modified plants and foods, etc.

I will sometimes distinguish between two broad classes of information products:

- "**Poems**" are intelligible directly by mere mortals, e.g.: conversations, email and instant messages, live and recorded speeches, written reports, newspapers and online reportage, magazines and e-zines, short stories and novels, compilations of data, ads, posters and billboards, live plays, rock concerts, rap songs and symphonies, paintings, movies, 3-D cartoons, web pages, etc.
- "**Platforms**" are *certain* "software programs". Software programs are fully intelligible only to other software programs or to programmed silicon chips. The software programs I include within the Industry are meant ultimately (though often only by being strung together) either to host or to deliver "poems", e.g.: operating systems, middleware, and database frameworks for general purpose computers or for PDA's, digital phones, TV set-top boxes, video game machines, etc., and business, educational, and entertainment applications software used in stand-alone or networked settings. I *exclude* from the Industry software that merely forms an integral component of, and is thus functionally inseparable from, a "machine" whose purpose lies outside the Industry's objectives – such as an airplane, an air conditioning system, an ATM machine, etc.

The many functions or activities carried out within the Industry – the "verbs" around which the Industry's firms typically organize themselves – I will group into three broad categories (setting to one side general management and administration, which are found in all firms):

- "**Authoring**": This is the raw creation of new information products, i.e: the activity of artists, music composers and performers, script writers, directors, animators, software programmers, anyone who converses with others (in live synchrony or otherwise), etc. Considered more broadly, "authoring" constitutes the basic engine of "innovation" in the Industry, essential for creating not only new products but also new business methods, models, and approaches to the market place.

- **"Publishing"**: In this team activity I include the fairly routine tasks of assembling, editing/testing, branding, and promoting/marketing/selling poems and platforms. The end product of publishing I will call "publications".
- **"Distributing"**: This activity consists of hosting or delivering information products (whether "raw" poems, publications or platforms) for access by their intended users. In the electronic Industry, this activity invariably includes "platforms" as critical components, but often accompanied by some sort of "network" and its related services.

Finally, by a **"market"** I will mean information products which some coherent group of customers regard as close substitutes. Because "coherent" and "close" are relative concepts, market definitions are inherently plastic, and a market can almost always be further divided into narrower markets. The "economic characteristics" of a given market depend on the nature of its product and of the functions necessary to supply it, and of course on the actual behavior of the suppliers and the surrounding regimes of law or regulation.

Two peculiar features of the Industry merit notice at the outset, as bearing importantly on the Industry's economics.

- *"Non-rivalrous use" of information products:*

Conventional economic analysis takes for granted certain basic notions of "property" and "contract law". The analysis regards a market's product and input resources as myriad discrete items that are privately "ownable" by the firms, which can buy and sell them, with each item usable exclusively by its owner. But an information product (whether an end-use product or an "input" resource for making other products) is at its core an intangible set of data. Once stripped of its tangible packaging medium, it becomes "non-rivalrous in use": absent some "law" decreeing otherwise, you and I can share that product without impinging on each other's use of it. This makes *society's choice* of a regime of "property" and "contract" law an important issue for economic evaluation.

- *The importance of "cross-market" behavior:*

Micro-economics focuses most of its tools and concepts on the behavior of firms *within* a defined market. "Market power" and "competitive processes" usually refer to *intra-market* phenomena. In the Information Industry, however, the *cross-market* behavior of firms has peculiar importance, for two reasons.

First, digital technologies have made the "authoring" function -- and "innovation" generally -- progressively cheaper, faster, and easier. This has shortened all product

life-cycles and made the whole Industry a classic arena for "creative destruction"³. This lovely term means the frequent, unpredictable and disruptive emergence of entirely new types of products that eradicate old market boundaries. Such radical "market-morphing" is often the Industry's most critical "competitive process", its chief engine for innovation, growth, and economic value creation. Therefore how "monopoly power" may affect the process of "creative destruction" *across* market boundaries is a significant policy issue in the Industry.

Second, "platform" products – i.e. software programs – typically ride atop or beneath each other. Platforms must "interoperate" with each other, and ultimately with poems and publications, according to particular standards or protocols if those platforms, publications, or poems are to reach their intended users.

These two phenomena – creative destruction and inter-operability -- riddle the Industry, creating unusual symbiosis, complementarity, and competition *across its individual market boundaries*. The phenomena are particularly evident across "distribution function" markets, and between "distribution" and "publishing function" markets.

III. The Welfare Economics of Monopoly Power

"Monopoly power" is most concisely defined as the ability of a firm to influence significantly the market price of a product⁴.

Absent monopoly power – i.e. in a "perfectly competitive" market -- each firm must take the market's prevailing price as a given and is able to choose only the quantity and character (i.e. the quality or features) of the product the firm will supply to the market.

Monopoly power notoriously eludes direct detection, much less accurate measurement. So, economists and policymakers generally fall back on *market share concentration* as a proxy for monopoly power. This is at best only a very rough proxy: even in a highly concentrated oligopoly, firms may find themselves without any significant, durable power to influence the market's prevailing price level⁵.

Given certain assumptions, welfare economics has shown that a fully competitive market will "optimally" allocate resources within a market and between it and the wider

³ This term was coined in 1942 – well before the advent of commercial computers -- by the Harvard political economist Joseph A. Schumpeter, Capitalism, Socialism and Democracy, 82-85 (3rd.ed. 1975).

⁴ Monopoly power is often called "market power" and is, however labeled, a concept of degree. Few markets have only one vendor, and a single firm's ability to influence a market's prevailing price level depends not only on the firm's share of the market but also upon the particular market's demand and supply curve elasticities. *See generally* Herbert Hovencamp, Federal Antitrust Policy: the law of competition and its practice 81 (2d ed. 1999).

⁵ *Ibid.*

economy.⁶ The market will gravitate toward an equilibrium point (at the intersection of the market's down-sloping demand and up-sloping supply curves), which maximizes the "economic value added" by the market to the general economy: this "value-added" is the difference between what each of the market's customers would be willing to pay for the product and the total costs incurred by all the firms supplying the market (i.e. the area under the market demand curve minus that under the market supply curve).

By contrast, to the extent it exercises "monopoly power", a firm can maximize its own profits by shifting the market's price level upward, and the total product quantity supplied to the market downward, creating a so-called "deadweight loss" to the market's allocational efficiency, i.e. reducing the total value-added (i.e. supplier profits plus consumer surplus) generated by the market to the wider economy.

Economists and antitrust analysts generally trace the presence of monopoly power to one or more of five sources. Whether and how monopoly power may reduce economic value-added by a market, and therefore whether and how "policy" should respond to such power, vary by the power's source.

- Temporarily superior performance:

One firm may garner an "abnormally" large share of a robustly competitive market – and thus gain some monopoly power -- by what antitrust doctrine traditionally sums up as "superior skill, foresight, and industry"⁷. Such feisty behavior *benefits* the economy longer term, either by lowering the feisty firm's (and thus the market's) supply curve or -- if the "superior skill" centers on branding and marketing prowess -- by elevating the market's overall (i.e. "all-brands") demand curve. In either case, "superior performance" will typically generate an *eventual net increase* in the market's "value added". Analysts implicitly assume that a firm's superiority will be transient: lagging competitors will fairly quickly "learn the tricks" of the market leader and proceed to match or leapfrog its performance. For all these reasons, superior competitive performance not only is tolerated but celebrated by policymakers.

- Horizontal combination:

Policymakers universally condemn "naked" conspiring among competitors to "fix" their prices or supply quantities, because this gives them, acting in concert, a monopoly power each would lack individually⁸. Of course, this same price/quantity fixing power also accompanies so-called "horizontal" (i.e. intra-market) mergers and joint ventures, but in those situations the deadweight loss may in some cases be more than offset by the value-enhancing effect of the supply (cost) efficiencies that can result from actually merging the firms' operations. So a horizontal merger may, net-

⁶ Kenneth J. Arrow and Gerard Debreu, *Existence of Equilibrium for a Competitive Economy*, 22 *Econometrica* 269 (1954).

⁷ *United States v. Aluminum Co. of America (Alcoa)*, 148 F.2d 416 (2d. cir. 1945)

⁸ *United States v. Socony-Vacuum Co.*, 310 U.S. 150 (1940).

net, either shrink or enlarge a market's total value-added, a policy judgment typically made case by case.

- Government monopoly grants:

Government not infrequently confers legal monopoly status on a particular competitor. The reasons vary – e.g. sheer politics, helping the preferred competitor raise private investment capital to create some socially desirable new product which the state, for whatever reason, prefers not to subsidize through the public treasury, or eliminating some side-effect of normal competition that the government thinks baleful. Policy analysts usually assess a monopoly grant by examining the economic merits of its ostensible justification and/or by measuring the monopoly's scope against that of the justification.

- "Inevitable (or 'natural') monopoly":

This slippery term covers three distinct situations. Each generates "increasing returns to scale", which in turn allow the leading firm to seize and durably hold all or most of the market⁹. The first two situations give rise to "extreme scale economies" which a leading firm can exploit so that its supply curve maintains an abnormal downward slope as supply quantities increase, eventually assuring the leader near or complete sole-supplier status in the market. The third situation involves instead an abnormal market demand curve, i.e. one which slopes upward rather than downward as supply quantities increase. This also gives the market-leading firm an opportunity to seize virtually the whole market.

-- *"positive learning feedbacks"*: In this situation, the superior skills of the market leader improve faster than laggards can match as each expands its scale of operations, because skill acquisition is itself scale-dependent. Superior cost performance is effectively "self-reinforcing" with the firm's scale of operations, and so the biggest firm keeps enlarging its lead and takes the whole market.

-- *"High start-up costs"*: Here, extraordinarily high launching costs for the market's product give the "first-mover" an ever-descending cost (i.e. supply) curve. Market entry by new competitors never happens or encounters almost certain competitive failure. The classic example is a railroad service, where the costs of laying tracks and buying train cars is very high relative to the marginal costs of simply running more frequent back and forth journeys.

-- *Network effects*: Here the market *demand* curve turns up rather than sloping down as the quantity supplied increases, because a user of the product derives value from *others'* use of it. Here again, the "first entrant" to reach a "critical scale" will more than likely gain a big and durable measure of monopoly power. Classic examples are telephone and instant messaging services: each

⁹ A full understanding of "increasing returns" phenomena is a fairly recent achievement by economists. The seminal work is W. Brian Arthur, Increasing Returns and Path Dependence in the Economy (1994).

customer will value the right to use the service more highly the more users are hooked into the service. The service provider with the most users will tend to attract more new users than its lagging competitors, at a much lower cost of marketing to them, and will therefore tend to take over the whole market. A computer operating system also generates network effects (albeit indirectly), even when its end users are not connected to each other: the end users value a system more as more applications are available through it, and application suppliers will naturally "write to" the system with the most users.

The conventional policy response to an "inevitable monopoly" is acceptance – because extreme scale economies and network effects themselves create lots of economic value. This acceptance is, however, often coupled with "regulation". Such regulation typically seeks to move the monopoly's price/quantity equation toward one resembling what pure competition would have delivered; but regulation can of course also impose its own "deadweight" costs of bureaucratic delay and error.

- Cross-market monopoly leveraging:

All the cases above deal with sources of monopoly power *within* a single market. A firm can also create monopoly power by "leveraging" established monopoly power from one market into a related market (i.e. one which buys from or sells to the first market, or whose product or service is complementary with the first).

Economists and antitrust scholars have long and heatedly debated the cross-market leveraging of monopoly power.

Until the 1970's, U.S. antitrust doctrine was uniformly hostile to a leading firm in one market seeking, or appear to seek, a significant share of a related market, whether by acquisition/merger activity by dealing exclusively with a firm in the related market, or by "product tying" arrangements between the two markets' respective products¹⁰.

But the 1980's saw a strong counter-trend, led by the "Chicago School" of law and economics. The Chicago School argued that a monopolist in one market can generally maximize its profit by *maintaining* robust competition in all related markets: this will maximize overall demand for the initially monopolized product. The Chicagoans also stressed that firms often enter adjacent markets, and/or use exclusive deals or tying arrangements across markets, not to "leverage" monopoly power into the new market but simply to reduce their supply costs -- a clear efficiency enhancement -- or to practice an indirect form of price discrimination in the first market -- arguably a benign practice. Therefore, the Chicago School concluded, it is usually folly for policy to block cross-

¹⁰ The classic, and highly critical, review of pre-1975 antitrust doctrines in these areas is Robert Bork, The Antitrust Paradox: a policy at war with itself 225-245 (rev. ed. 1993).

market mergers or discourage exclusive dealing or product tying practices by market leading firms¹¹.

Deferring to this reasoning, the courts and the Justice Department largely lost interest in cross-market monopoly power. Though few old cases or judicial doctrines were explicitly over-ruled, the entire area slipped in enforcement priority, and the tide of practical case decision moved toward leniency¹².

More recently, however, many economists have counter-demonstrated that cross-market monopoly leveraging can be highly profit-maximizing under certain circumstances, e.g.: if the second market has characteristics of "inevitable monopoly", and/or the second market looks likely to obsolete the first, and/or the second market serves a significant number of customers who don't directly or indirectly use the first market's product¹³. In the Information Industry, these "exceptional circumstances" happen all over the place, because the Industry is a hot bed of disruptive market-morphing and "inevitable monopoly" markets.

The net result of all this scholarly debate has been an awkward legal muddle. Policymakers and the courts are beginning to recognize the importance of cross-market monopoly leveraging in the Industry, but they have at hand no well-worked legal or regulatory tools, or even concepts, to address it.

IV. A Diagnosis of Monopoly Power in the Industry

One can summarize all this welfare economics by defining four distinct monopoly power "ailments":

- **Unjustified government monopoly grants** – where a state grant of monopoly is excessive to the government's declared justification, or the justification is economically non-optimal.

¹¹ Regarding the Chicago School, *see generally*: Robert Bork, *supra* note 10, Richard Posner, *The Chicago School of Antitrust Analysis*, 127 U.Pa. L. Rev. 925 (1979), E. Kitch, *The Fire of Truth: a remembrance of law and economics at Chicago, 1932-70*, 26 J.Law & Econ. 163 (1983). Regarding Chicago School analysis of tying arrangements and other "vertical" restraints, *see*: Ward Bowman, *Tying Arrangements and the Leverage Problem*, 67 Yale L.J. 19 (1957), Robert Bork, *The Rule of Reason and the Per Se Concept: price fixing and market division (part 2)*, 75 Yale L.J. 373 (1966), and Richard Posner, *The Rule of Reason and the Economic Approach: reflections on the Sylvania decision*, 45 U.Chi. L. Rev. 1 (1977).

¹² *See* Robert Bork, *supra* note 10, at Epilogue, and Herbert Hovencamp, *supra* note 4, at 318, 385-386, 389.

¹³ Jay P. Choi and Chris Stefandis, *Tying, Investment, and Dynamic Leverage Theory*, 32:1 Rand J.Econ. 52-71 (2001). Dennis Carlton and Michael Waldman, *The Strategic Use of Tying to Preserve and Create Market Power in Evolving Industries*, NBER Working Papers No. 6831 (2000). *See generally*: M.A. Lemley and D. McGowan, *Legal Implications of Network Economic Effects*, 86 Calif. L.Rev. 479 (1998); M.L. Katz and C. Shapiro, *Network Externalities, Competition, and Compatibility*, 75 Amer.Econ.Rev. 424 (1985); Richard Schmalensee, *Antitrust Laws in Schumpeterian Industries*, 90:2 Amer.Econ.Rev. 192 (2000).

- Unjustified horizontal combinations – where a cartel, joint venture or merger generates allocational inefficiency by eliminating or reducing competition among its parties without generating enough operational scale economies (i.e. enough lowering of market supply costs) to off-set this deadweight loss.
- Poorly-addressed natural monopolies – where the state's "corrective" regulation of an inevitable monopoly is ineffective or over-broad, or imposes excessive bureaucratic costs.
- Cross-market monopoly leveraging – where a leading firm in one market uses exclusive deals, or product tie-in's with a related market to leverage monopoly power into the second market, rather than merely to garner operational scale economies or to exercise price discrimination in the first market.

In practice, spotting any of these "ailments" with certainty is impossible; the exercise requires lots of judgment and, in the end, guesswork. I will nevertheless proceed in this section to probe and poke at our patient, and report my diagnostic observations; in the following section, I will venture recommendations on policy treatments and cures.

A. Government grants of monopoly

The federal government today regularly grants significant monopolies in two areas of the Industry: (a) the creation of "intellectual property rights" via grants of patent and copyright monopolies that restrict "non-rivalrous use" of poems and platforms, and (b) the creation of "frequency monopolies" by FCC allocations of the radio spectrum to private parties.

Intellectual property protection influences competitive behavior chiefly in the Industry's authoring and publishing functions, while the radio spectrum monopolies chiefly affect the (wireless) distribution of information products.

In both these cases, the monopolies are created by conferring exclusive private property rights over products or resources that would otherwise exist in a "commons", i.e. the "public domain". Such "enclosure" actions are not typically viewed as "monopoly grants", but such – from a rigorously economic perspective -- they are. The welfare economic issue is whether the "enclosed monopolies", as designed, result in more or less "value added" than leaving the product or resource in a commons *or* enclosing the commons in some fundamentally different way.

1. Intellectual Property Protection

Intellectual property rights flow from many statutes and common law doctrines. I will focus here on the federal copyright and patent laws, as these shape all other sources of intellectual property protection in the Industry.

Absent patent or copyright protection, a poem or platform would generate considerable "value added" simply because its "non-rivalrous" use by a potential infinity of customers would entail only the costs of packaging the product temporarily (if necessary) in some tangible medium, distributing it, and actually finding the desired product in the haystack of all available poems and platforms. The holder of an intellectual property right, however, enjoys the monopoly power to raise very significantly the product's price and lower the quantity supplied, profiting the right-holder but shrinking the "consumer surplus", and destroying a substantial amount of the value-added that would otherwise flow from the product's non-rivalrous use. Accordingly, a regime of copyrights and patents can be justified *as a matter of economic efficiency* only if it sufficiently increases the creation of *new* poems and platforms, and/or so reduces customer search costs, as to offset the regime's inevitable destruction of non-rivalrous use value.

The Nation's Founders appear to have embedded this economic calculus in the U.S. Constitution's requirement that Congress create patents and copyrights only "[t]o promote the progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries".¹⁴

To assess whether any given regime of intellectual property protection gets this calculus right, no reliable "quantitative" test exists (or likely ever will). I believe strongly, however, that we today have the economic equation badly wrong: we are "over-granting" intellectual property rights and in the process detracting significantly from the net value-adding potential of information products.

This belief stems from two broad (and, I concede, "unprovable") observations: first, the authoring and publishing functions could in theory work reasonably well with considerably less intellectual property protection than we today confer; second, the dramatic expansion in copyright and patent protection of recent years does not appear to have flowed from any reasoned economic analysis.

The authoring and publishing functions do not require lavish intellectual property protection.

Even in a world without *any* copyright or patent protection, these functions would soldier on, though of course much transformed. Publishing would continue as a skinny "search engine" function, and authoring would continue as a "natural" human activity. There likely would be fewer new poems, publications, and platforms, at least of certain types – e.g. expensive blockbuster-type movies, lavishly assembled multi-topic magazines and e-zines, and perhaps (though this is very debatable) certain highly complex or specialized types of software programs. On the other hand, the information products that *did* get authored would generate considerably more economic value than they do today, because they would be available for low cost "non-rivalrous" use by everyone.

¹⁴ U.S. Constitution, Art. 1, Sec. 8, Cl. 8.

The point here is *not* that a zero-protection world would be better than *any* other protection scenario but only that *comparing* the economic efficiency of different conceivable regimes of intellectual property protection requires a complex balancing of conflicting economic effects. One cannot simply assume, though many do, that more intellectual property protection results in more economic value-creation: this assumption confuses the monopoly profit harvestable by holders of intellectual property rights with the total economic value created under different regimes of intellectual property protection.

Publishing's basic function is to cut customer search costs, i.e. to help customers find the poems and platforms they want. Most publishers (whether working in print or online) do this today by pre-selecting needles from the haystack of raw content, assembling these into edited packages ("publications"), and then branding and marketing the results, looking for profit by charging fees to customers for, and/or by selling ads on, the publications. Absent copyright protection, however, the publications could be freely copied by competitors: the customer fees would wither, and the ad revenue would scatter in all directions. So, if unprotected by copyright law, publishing as a commercial activity might shrink down to a less costly search-help business, supported by such proprietary "competitive advantages" it could muster through skill, self-promotion, and technology under the limited protection of trade secret, trademark, and confidential information laws. I leave to the reader's imagination which new business models might arise and which old ones perish. The point is that the publishing function's "size", its total call upon the economy's resources, *reflects* the prevailing legal regime of intellectual property protection but does not itself indicate the *economic merits* of any particular regime of protection.

The authoring function presents a different picture. Without vigorous authoring, the pool of poems and platforms would be stagnant. Therefore, authoring is the function most often thought in need of *thick* intellectual property protection. This is presumably why patents and copyrights go initially to authors and why intellectual property rights are defended chiefly as incentives for authors to create new poems and platforms¹⁵.

It is, however, very easy to *over-estimate* the financial incentive – the *amount* of government conferred monopoly power -- that is required to assure vigorous and fruitful creative activity by authors.

Authoring, unlike publishing, or indeed most activities in commercial life, is a *natural act for human beings*. To be blunt, we authors are as a class over-eager geese that can't help but lay eggs (some golden, many mainly lead) regardless of diet. Let authors be authors, and they will, well, author. Of course *some* won't, but there are lots of authors in the

¹⁵ A focus on "author rights" can also be animated by a belief that authors have an extra-economic (or frankly non-economic) "moral" claim to their creations. But American law, unlike European intellectual property law, does not recognize such "moral" rights. Conversely, one can use a special deference to authors' interests to defend a larger realm for the "public domain" and a commensurately lesser role for intellectual property protection. Such reasoning underlies Professor Lessig's felicitous characterization of the public domain as a "creative commons". Lawrence Lessig, *The Freedom of Ideas* (2001).

world, at all levels of skill, for every conceivable genre of poem or platform. With the ever-descending cost of digital authoring tools (from word processing and spread sheet programs, through digital mini-cameras and music synthesizers to super-easy software programming tools), the world-wide reservoir of authors is expanding rapidly and is ever more cheaply and swiftly accessible over the Internet to every publisher.

I readily concede that wealthy patronage, from the Medicis' largesse through stock option grants from Microsoft, has brought forth information products of genius. But, with startling regularity, great paintings have also issued without financial sponsorship from windowless garrets, brilliant music from the meanest of streets and alleyways, and zillions of lines of impressive code from penniless hackers and networked teams of unpaid "open-source" software programmers. Each year brings its new tide of high quality poetry, short stories, songs, unsolicited magazine articles and foreign reportage, documentaries, satirical animations, clever new computer operating systems, specialized software applications, etc. – for much of which there exists absolutely no commercial audience.

Despite the Industry's sacred mantra that "content is king", new poems and platforms are in truth scandalously cheap. Authors, being many in number and naturally prolific, simply don't cost very much. Industry firms generally have "R&D" or "editorial" budgets that constitute only 5-20% of their revenues, and much of this spending goes for routine tasks of editing, product testing, or technical support, not for core authoring¹⁶. Any close correlation between dollars spent on new content and an enterprise's competitive success is usually very difficult to establish.

Put graphically, the "supply curve" for nearly any category of new poems and platforms is a horizontal line, extending to infinity, at a price near zero: supply everywhere exceeds demand.

This wonderful glut of new content does, however, require one critical nutrient: ready access to *old* content. "Culture" evolves and accumulates; it is not invented afresh with every stroke of innovation. Poems and platforms, even those of revolutionary novelty, are invariably built up from preceding ideas, models, components, influences, phrases, code sequences, etc. This means that lavish protection of intellectual property is not merely inessential to the creation of new content but can actually impede it-- by blocking, delaying, or raising the costs of accessing old content. Intellectual property protection is subject to sharply diminishing marginal productivity in terms of stimulating more authoring – to the point where, in the extreme, the marginal productivity of the incentives turns negative because authors are overly restricted in their access to old content.

¹⁶Regarding R&D costs as a percentage of sales, *see* Raymond Wolfe (project director National Science Foundation, Division of Sciences Resources Statistics), Research and Development in Industry: 1999, NSF 02-312, Tables A-21-22 (2002). Regarding Editorial costs as a percentage of sales, *see* [to come].

Recent expansions of copyright and patent protection lack economic justification

The last quarter century has seen an unprecedented expansion in the scope and depth of U.S. copyright and patent monopolies¹⁷. It is obvious why the changes were thought good for established holders of copyrights and patents and for intellectual property lawyers, and sometimes (not always) why the changes were regarded as "linguistically logical" interpretations of various statutes and legal doctrines. Why these changes were good for general economic value creation, however, remains a mystery – a mystery, I fear, incapable of solution.

(a.) Copyright

A copyright protects its holder against unauthorized copying of the work, and of its "derivatives", for a fixed period. The core "infringing" conduct is "piracy", where competitors merely copy the original and distribute it for their own profit. The scope of the monopoly has traditionally been disciplined by keeping the period of protection limited, and by two legal doctrines -- the distinction between uncopyrightable "ideas" and the protected "expression" of these ideas (a distinction that serves indirectly to limit the monopoly's coverage of "derivative" works authored by others), and the allowance of "fair use" of protected works for certain purposes in certain contexts.¹⁸

Congress made software programs copyrightable in 1980.¹⁹ This usefully made clear that wholesale pirating of programs for profit is unlawful. Otherwise, however, copyright protection has been a mixed blessing for a field that was flourishing quite nicely without it. In at least three respects the traditional framework of copyright law has proved at best an awkward fit for the unique character and authoring realities of software.

- Uncertain scope of copyright protection:

A copyright holder need not declare herself such, much less clarify what aspects of a work the copyright protects, unless and until she brings an actual suit for infringement against a new work. The resulting uncertainty facing authors of new works is multiplied for programmers because of the uniquely phased character of the software writing process. In the first phase, someone – typically a business manager – writes a "functional specification" in lay language, outlining the marvelous new things the program should do for users. Second, programmers convert this functional outline into a "technical specification" and, from it, author the new program in "source code", using a human-readable language such as C++, Java, BASIC, etc. Nothing up to this point is "published"; it is all stowed away under lock and key and, typically, further

¹⁷ Patent protection has "thickened" chiefly from the activism of the Patent Office, heavily backed by the Court of Customs and Patent Appeals, which was created in 1982 and has proven far more "pro patent" than the normal federal appeals courts. *See generally* Fred Warshofsky, The Patent Wars (1994). By contrast, the thickening of copyright protection has been largely the product of new congressional legislation. *See generally* Lessig, *supra* note 15, at 98, 106-107, 110, 196-197, 216, 264.

¹⁸ For a good summary of these and other basic principles of copyright law, *see* Arthur R. Miller & Michael H. Davis, Intellectual Property 295-406 (3rd edition, 2000).

¹⁹ 17 U.S.C. sec. 117.

shrouded under the protection of state laws of "trade secret". The source code is next "compiled" (by a standard computer program) into "object code". This consists of long sequences of digits – 1's and 0's – that are directly understandable only by computers. This object code is then licensed or sold to end users for revenue. In the final phase, these users "execute" or run the object code and, one hopes, experience all manner of marvelous new capabilities.

Now, what exactly does a "copyright" on the program protect? The unpublished functional or technical specifications? The unpublished source code? Some sequences of digits from the object code and, if so, which sequences? The "look and feel" of the ultimate user experience and, if so, what aspects of this experience? No author of new programs can know any of this, because the exact scope of an outstanding copyright is decided by the peculiar facts and circumstances of each litigated case.²⁰ As a result, the copyrightability of software has imposed a new and heavy "risk tax" on the Industry's basic engine of innovation.

This tax bites particularly hard in the software field. Though innovation in any discipline involves building on the past, the pull of history has an especially strong gravitational force in software: it is the express and commercially necessary purpose of most new programs to outdo the efficiency or functionality of old programs but also to work compatibly (i.e. "interoperate") with old ones. It is therefore vital that a sharp line exist between what in the old is non-violable, as a disallowed "derivative" version of the old, and what is allowable as genuinely new, involving only the re-use of "ideas" from the old. Rather than such a bright line, copyright law presents the putative innovator with a near-random game of chance.

- Near-perpetual duration of copyright protection:

The commercially appealing life of a software program is very short – at most a few years. Though old stuff often remains installed for much longer, no one makes a dime selling or licensing copies of it. By contrast, the duration of copyright protection is measured in multiples of decades. Copyrights don't vanish or even weaken with the age or non-use of a work,²¹ and lobbying pressure from giant publishers of books, music, and movies has impelled the Congress repeatedly to stretch out the period of copyright protection.²² Copyright terms are now far longer than an author working in any medium or discipline could rationally find to be "incentivizing".²³

²⁰ See *Micro Star v. Formgen Inc.*, 154 F.3d 1107 (9th Cir. 1998); *Lotus Corp. v. Borland International, Inc.*, 49 F3d 807 (1st Cir. 1995), *affirmed* 516 U.S. 233 (1996); *Apple Computer Inc. v. Microsoft Corp.* 35 F.3d. 1435 (9th Cir. 1994), *cert. denied* 513 U.S. 1184 (1995); *Johnson Controls, Inc. v. Phoenix Control Systems, Inc.* 886 F.2d 1173 (9th Cir. 1989). See generally: Siva Vaidhyanathan, Copyrights and Copywrongs 112-114 (2001), and Alfred Yen, *A First Amendment Perspective on the Idea/Expression Dichotomy and Copyright in a Work's "Total Concept and Feel"*, Emory L.J. (1989), at 404-406.

²¹ For innovative ideas on this aspect of copyright law, see Justin Hughes, *Fair Use Over Time*, 50:3 UCLA L.Rev. 775 (2003).

²² The current duration of a copyright is the author's life plus 70 post-humous years, versus only 14 years (renewable for up to 14 more years during the author's life) in the Nation's first copyright status. The

- Potential threats to software "re-engineering":

It has long been a common and accepted practice in the software industry to use lawfully-licensed "object code" to help a programmer guess at and "re-engineer" the basic logic of an old program's secret "source code", so that the programmer can write a new, non-infringing program that outperforms the old one and/or interoperates well with the old one. Such re-engineering, for technical reasons, requires repeated "copying" of the object code of the old program (though only for the new author's own use, not for "re-publishing" the old program). At the moment, bona fide "re-engineering" projects are apparently still allowed under copyright law's "fair use" doctrine²⁴. But there is considerable litigation in the area, the Supreme Court has not addressed the issue, and it would not take much further "pro-copyright" doctrinal evolution to put the re-engineering of software effectively out of business.

- The technological and legislative "leapfrogging" of copyright law.

We are now witnessing a three-front war that threatens to bring down the basic structure of copyright law. The first front was opened by "peer-to-peer file sharing", the ability of Internet-connected computers to share files directly with each other.²⁵ The mass free sharing of copyrighted material is a flagrant (a "not fair use") infringement of copyright law, but it's an open question whether judicial processes alone can shut down such infringement. Opening a second front in the struggle, the Industry is beginning to roll out ever more sophisticated "digital rights management" (DRM) software that gives an author or publisher plenary control over whether and precisely how users can use or further distribute a work.²⁶ The *technological* protection afforded by DRM technology creates a monopoly via sheer physical possession that transcends the limited property concepts traditionally applied to published information products. Finally, opening front number three, Congress has now leaped into the fray to criminalize attempts to hack or disable DRM software,

Congress has legislated 11 retroactive extensions of copyright's term in the last 40 years, versus two such extension's in the Republic's first 150 years. Lessig, *supra* note 15, at 107.

²³ Eldred v. Ashcroft, 537 U.S.____, ____ (2003) [dissenting opinion of Justice Breyer]. Justice Breyer's mathematical demonstration that the most recent statutory extension of copyright terms cannot be rationally justified as an incentive to authors presumably did not rise to constitutional dimensions in the judgment of the Court's majority – but his argument seems to me unanswerable as a matter of economic logic and, therefore, as a guide to minimally responsible public policy.

²⁴ Sony Computer Entertainment, Inc. v. Connectix Corp., 203 F.3d 596 (9th Circ. 2000). *See also* Sega Enterprises Ltd. v. Accolade, Inc., 977 F.2d 1510 (1992). For an argument that reverse engineering should not be liberally allowed under copyright law, *see* J. Vining, *The Future of Computer Software in the Reverse Engineering War: Excessive Protection v. Innovation*, 67 *Brooklyn L.Rev.* 567 (2001).

²⁵ Peer-to-peer technology has a considerable heritage on the Internet, though its mass popularity is quite recent. *See* Nelson Minar and Marc Hedlund, *A Network of Peers: Peer-to-Peer Models Throughout the History of the Internet*, at 3-15 in Andy Oram (ed.), *Peer-to-Peer: Harnessing the Benefits of a Disruptive Technology* (2001).

²⁶ For a brief explanation of DRM technologies, *see* Joshua Duhl and Susan Kevorkian, *Understanding DRM Software Systems: An IDC White Paper* (2001), accessible via <http://www.intertrust.com>.

thereby creating new law that also makes a hash of the fragile doctrinal balances that characterize copyright law.²⁷

Who will prevail in this three-front war is anyone's guess; but, whatever the outcome, the result won't be copyright law as we have known it; technology – in one way or another – either will have eroded the "physical" reality that information products are inherently "non-rivalrous" in use, or will have made that reality so potent as to defeat any legal limits on it. In brief, entirely new forms of monopoly power, and new ways to undermine it, are swiftly clouding up the Industry's horizon.

(b.) Patents

The courts – upsetting prior rulings – have now authorized the patenting of software.²⁸ Perhaps it was inevitable, and even logical, that patents should be recognized for software components of broader, machine-like inventions whose purposes lie outside those of the Information Industry; machines have always been patentable, and their componentry is increasingly "soft" rather than mechanical or electro-mechanical.²⁹ But for what I have here called "platforms" – software products that host or deliver poems or other platforms that do so -- patent protection is worse than unnecessary:

²⁷ The Digital Millennium Copyright Act [DCMA], 17 U.S.C. sec. 1201(a)(2). *See generally*: David Nimmer, *A Riff on Fair Use in the Digital Millennium Copyright Act*, 148 U.Pa.L.Rev. 673 (2003); *Symposium, Exploring Emerging Issues: New Intellectual Property, Information Technology and Security in Borderless Commerce: The Anti-Circumvention Provision of the DMCA*, 8 Tex.Wesleyan L.Rev. 593 (2002). Initial court decisions under the DMCA have rejected constitutional objections to the Act's anti-circumvention provisions (e.g. objections that allege such provisions intrude on First Amendment rights or transcend Congress' power to legislate protection of intellectual property): *Universal City Studios, Inc. v Corley*, 273 F.3d 429 (2d. Cir. 2001); *U.S. v. Elcom*, 203 F.Supp.2d 1111, 1138-41 (N.D. Calif. 2002). The DCMA does direct the Librarian of Congress to conduct a review every three years of the Act's effects and authorizes the Registrar of Copyrights to exempt from the Act whole classes of works on which the Act may be foreclosing use that is not an infringement of copyright law. DCMA *supra* at sec. 1201(a)(1)(b) and (c). But the first such review resulted in no exemptions. Copyright Office, *Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies; Final Rule*, 37 C.F.R. Part 201, 65 Fed. Reg. 64556-01. *See also* Nimmer *supra* at 693. Similarly, the courts have permitted license terms embedded in so called "shrink wrap licenses" to go beyond the intellectual property protection provided by traditional copyright law. *Pro CD, Inc. v. Zeidenberg*, 86 F.3d. 1447 (7th Cir. 1996).

²⁸ *State Street Bank & Trust v. Signature Financial Group*, 149 F.3d 1368 (Fed. Cir. 1998), *cert. denied* 525 U.S. 1093 (1999). The earlier view held that software was not patentable because it consisted merely of mathematical algorithms, analogous to unpatentable mathematical formulae and mental processes. *Gottshalk v. Benson*, 409 U.S. 63 (1972).

²⁹ The courts seemed to embraced this position in *Diamond v. Diehr*, 450 U.S. 175 (1981), but have clearly now endorsed the patentability all software that produces a "useful, concrete and tangible result," regardless of being components of some larger complex or machine. *State Street Bank & Trust v. Signature Financial Group*, *supra* note 28, at 1373.

- Unlike "machines", platforms are already amply covered by copyrights. It is very odd, if not unprecedented, for an important class of products to qualify for both forms of monopoly protection.³⁰ The software industry came into being and flourished for decades without this double-coverage.
- Securing and defending against patents are enormously costly, time-consuming activities: no other species of litigation is more complex, doctrinally arcane, and uncertain in its outcome.³¹ The advent of patenting has imposed a new "tax" and a big set of unfathomable risks, on innovation in general, and on new software ventures in particular, throughout the Industry.
- Though copyright law has often dealt awkwardly with the complex, multi-phase process of software authoring,³² the patent statute plainly misfits these realities.
 - Along with holding software to be patentable, the courts embraced the patentability of the "business methods" or business models that are typically reflected in the "functional specification" that initiates the software authoring process.³³ These aspirational statements are usually mere ideas or wish lists, quite obvious in their desirability, and therefore equally obvious to any savvy business person in the field; few of them even remotely fit the patent statute's requirements of "novelty" and "non-obviousness". Yet hundreds of these business method patents have now issued. This is just silliness: most of these patents will get invalidated if and when pursued to final litigated judgment, but that takes many months and millions of dollars in legal fees and risks for accused infringers.
 - Patent claims are also now often made and granted to cover the basic logic of the *undisclosed* source code from which the sellable or licensable program has been generated. In effect, the patent filer gets the benefit of the statute's monopoly protection without meeting the statute's corollary obligation to make the patented matter public. This one-way street is of very doubtful legality and has no economic logic.
 - No "fair use" exception exists in the patent laws. Therefore, users of patented software can arguably be barred from using duly licensed object code to "re-engineer" new software, even though the latter does not infringe the patent. This obstacle to re-engineering could cut off one of the Industry's primary avenues of new competitive entry into software markets.
- Like copyrights, patents can extend under certain circumstances to derivative works, but the two statutes use quite different definitions for derivative status.³⁴ Only the rare expert on both statutory schemes can sort out the differences or

³⁰ See J.H. Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, 94 Columbia.L.Rev. 2432 (1994).

³¹ The average cost of a patent suit has been estimated at \$1.5 million per party. Ian Mount, *Would You Buy a Patent License From This Man?*, eCompany (April 2001).

³² *Infra* at .

³³ *State Street Bank & Trust Co. v. Signature Financial Group*, *supra* note 28. See Rochelle Cooper Dreyfuss, *State Street or Easy Street: Is Patenting Business Methods Good for Business?*, 6 U.S. Int. Property: Law & Policy 277 (2000).

³⁴ See Reichman *supra* note 30.

predict their possible interactions in litigation. This bonanza for lawyers creates another layer of cost and uncertainty for business innovation and entrepreneurship.

2. Radio spectrum monopolies

Since its inception, the Federal Communications Commission has been enclosing the natural commons of the radio spectrum into private monopoly franchises, allocating frequency usage exclusively to private companies, initially for radio stations, then for TV stations, more recently for wireless communications companies. Allocations are done by regulatory fiat or, more recently, by outright auction.³⁵ Most of these franchisees of course enjoy extremely high profit margins. The justification for creating these monopolies has been to avoid mutual signal interference. The progress of digital technology, however, is beginning to undercut this justification: with digital transceivers and packetized data, many competing wireless networks can simultaneously co-use a slice of frequencies with little or no mutual interference.³⁶ New wireless networks could therefore develop in a much more robust competitive environment than did classic local and national radio and television broadcasting.³⁷

B. Natural ("inevitable") monopolies

"Natural monopolies" are typically assumed to be both inevitable and productive of cost-reducing or demand-enhancing social benefits, and "regulating" a natural monopoly after the fact in an economically efficient manner is very difficult. It is therefore important to diagnose alleged examples of "natural" monopoly power with some care. Otherwise one can too hastily conclude that natural monopoly is so pervasive in this industry as to render the authoring, publishing and distribution of electronic information entirely unsuited to any form of "normal" government attention or control. In truth, the classic sources of natural monopoly -- i.e.: positive learning feedbacks, extraordinarily high product launch costs, and network effects. -- operate quite selectively in the industry. One can of course argue that public policy should take small heed of monopoly power throughout commerce,³⁸ but the Electronic Information Industry does not present a "special case" in this regard.

³⁵ See generally *Spectrum Policy Task Force Report*, FCC ET Docket No. 02-135 (Nov. 2002).

³⁶ *Ibid.*, at 13-14.

³⁷ See Yochai Benkler, *From Consumers to Users: Shifting the Deeper Structure of Regulation Toward Sustainable Commons and User Access*, 52 Federal Communications L.J. 561, 572-573 (2000).

³⁸ For instance, Joseph Schumpeter believed that "creative destruction" has operated throughout the entire economy since the dawn of the industrial revolution, that monopoly power is necessary to fuel that process, and that conventional economics has therefore been generally misguided in opposing the formation of monopoly power by "private" (as opposed to state-assisted) forces. He was not in this regard distinguishing "natural" from "unnatural" sources of monopoly power; nor of course was he singling out the Electronic Information Industry for special treatment, as that industry was of very minor general economic importance in 1942. Schumpeter, *supra* note 3, at 89-90.

1. Positive learning effects:

These no doubt occur, but there is reason to suspect this Industry may be less prone to them than are other lines of commerce. Because information products have short half-lives, and creative destruction often overturns market boundaries, a firm must frequently learn entirely new tricks to survive and stay ahead of the game. The large scale of an established market leader, however, typically proves an institutional obstacle to learning entirely new tricks. The risk/reward financial balance for investing in possible new technologies and markets rarely "pencils out" for a successful market leader, because its loyal customers rarely understand or feel a need for the "new stuff".³⁹ It is very striking, for instance, that established leaders have rarely led or come out on top of the many big new waves of innovation that have periodically transformed the Industry.⁴⁰

2. High product launch costs:

Though "poems" hardly ever involve high launch costs, "platforms" (i.e. software products) and "distribution networks" often do, the former owing to "R&D" costs, the latter to the big upfront investment needed to build a physical network. But the monopoly-generating impacts of these high launch costs should not be exaggerated.

- Absent "network effects" – a phenomenon distinct from high launch costs -- expanding the sales and market share for a platform product or network requires non-trivial marginal marketing costs, and these costs will typically tilt a firm's supply curve upward long before the firm seizes the whole market.
- Writing new software is, like all authoring, cheaper than is commonly supposed.⁴¹ Further, given short software product half-lives, R&D costs for most software firms tend to be reasonably scale-variable, i.e. a continuous cost of on-going operations and normal growth, subject eventually to conventionally increasing marginal costs like most operating expenses. The prominent monopoly power that characterizes many platform markets is due far more to "network effects" than to high R&D launch costs.
- A new entrant can usually "rent" the capital equipment needed to build a network, or indeed rent unused network capacity from existing players, and so avoid massive launching costs. I am aware of only two substantial cases of durable monopolies attributable to very high new network build costs – local copper wire phone networks and local cable TV systems. These of course present the

³⁹ See Clayton M. Christensen, *The Innovator's Dilemma*, Ch. 4 (1997).

⁴⁰ For instance: Western Union dominated telegraphy but got nowhere in telephonic communications. The big three broadcast TV networks played little role in the growth of cable TV systems or cable TV programming. Cable systems firms have not led in satellite TV systems. IBM dominated mainframe computing but ceded leadership in minicomputers to Digital Equipment Corporation and leadership in PC's to Intel, Microsoft, and Dell. The mega-publishers of print newspapers and magazines were unable to capture the new world of web-based consumer portals. On-line auctioning is led by e-Bay, not Sothebys or Christies. Digital communications equipment is dominated by Cisco, not Lucent or Nortel.

⁴¹ See *infra* at .

notorious "last mile" problem, a genuine monopoly power conundrum in the Industry. The *national* monopolies and oligopolies found in these two industry segments have, by contrast, generally been caused by mergers, not by prohibitively high network building costs. Similarly, the oligopoly structure of national radio and TV broadcast networks resulted from merging or affiliating local monopoly franchises formed by government grants of exclusive spectrum use and were not attributable to prohibitively high network launch costs.

3. Network effects:

Powerful network effects *do* pervade the Industry's distribution function. That function, after all, consists chiefly of communications networks and/or of platform software, the former generating network effects by definition, the latter doing so indirectly by the interplay of end-user volume and the number of applications and poems hosted by the platform in question.

These pervasive network effects, however, do not "inevitably" lead to monopoly power. *That* step requires, *in addition*, that the "connection standards" between communications networks, or between software platforms and the third party applications or service which they host, be "proprietary" (i.e. "closed"). When such standards are instead "open and free of charge", the network effects still exist, indeed are much magnified, but no single vendor can "internalize" them: each vendor's market share therefore depends in conventional competitive fashion on the relative superiority of its particular product's quality and features and cost structure in supplying that product. If access is "open" except for a non-discriminatory fee, some internalization occurs (due to the fee), but cross-market leveraging of monopoly power become very difficult. It is the "standards regime" that explains why some of the Industry's distribution markets display considerable monopoly power (e.g. the markets for PC operating systems, online media players, video game platforms, and instant messaging), while others are savagely competitive (e.g. the markets for long-distance voice communications, the markets for supplying "open source" software "distributions", and nearly the entire "Internet standards"-based domains of communications and applications hosting). Network effects are a "natural" feature of all these distribution markets, but monopoly power is not: monopoly power is instead the result of "closed standards".

4. Bottom line:

Durable and significant monopoly power can be largely traced to forces of "natural" monopoly in only two distribution function areas: local (i.e. "last mile") fixed-line networks, and the general absence of "open" connection standards between competing networks and between primary platforms and third parties that provide applications, content, and services via such platforms. How to solve the last mile problem, and how best to promote open standards, are therefore very prominent challenges facing public policymakers. These are indeed knotty problems, but the Industry *as a whole* is not

"naturally" or "inevitably" monopolistic. This is not an industry that "inherently" requires either pervasive government intervention or none at all.

C. Horizontal combination

Labeling a combination of firms "horizontal", rather than "vertical" (or otherwise "cross-market"), depends entirely on how one draws market boundaries. For simplicity of exposition, I will here classify as "horizontal" those combinations that unite several publishing (i.e. "content") properties or that unite products within a single distribution technology or "mode", and will assign all others to the "cross-market" category. Using that (concededly arbitrary) classification, my overall conclusion is that horizontal mergers and joint ventures in the Industry, while legion in number, usually carry neither significant harm nor significant benefits for economic efficiency. The big exceptions to this comforting conclusion are "nationalizing" mergers of telecommunications, cable, or broadcasting networks.

Horizontal "publishing" combinations involving newspapers, book imprints, and/or magazines were common long before the same trend swept across movie, music, TV programming, and e-zines. These mogul-making combinations always promise huge "synergies" of overhead cost reduction and cross-marketing prowess, and simultaneously draw cries of alarm from defenders of "content diversity". In the end, however, the synergies typically prove elusive, or are swamped by the enhanced diseconomies of managing added complexity, and content diversity emerges largely unscathed. These mergers, and the "media empires" they build, seem to come apart about as frequently as new examples emerge. Content-amassing mega-mergers are more hype than substance for a simple reason: monopoly power in publishing is largely due to branding (i.e. to the content selection and marketing skills required to create and sustain a brand), and successful brands typically attach to discrete information products, not to the publishing enterprises that may own the brands. Brand marketing is itself an element of normal "competitive superiority", and brand leadership is in any case usually transient, because it can be eroded at fairly low upfront costs by skillful new entrants. Marketing – the crux of the "publishing" function – is, after all, largely a volume-variable expense. Simply combining lots of brands under one corporate roof does not substantially alter those fundamental realities. So, media mega-mergers – as a generalization -- amount to much ado about quite little from an economic point of view.

Combination activity within a *distribution* mode or technology presents a more complex picture.

Turning first to software platform markets, few of these owe the monopoly power they may contain to merger activity. It has been, for instance, rare to see mergers among different brands of operating system, or different brands of web media players, or of different brands of database software systems, etc. Software mergers have typically been among non-leaders, in usually vain efforts to defend against the market's leader's steadily

escalating market share, e.g. IBM's merger with Lotus (defending against Microsoft's lead position in PC application software) or Oracle's attempt at merging with Peoplesoft (to counter SAP's lead in enterprise resource planning software). The monopoly power in each such market usually has arisen instead from one company's unilateral success in using proprietary application protocol interfaces (i.e. "closed" standards) to appropriate the network effects that naturally infect the particular market.

In the area of telecommunications networks, TV/radio broadcasting networks, and cable system networks, by contrast, combination activity has had a substantial impact on Industry economics.

As a first step, "consolidating acquisitions" were commonly used to build regional monopolies from the more localized community or neighborhood monopolies that emerged because of the high upfront costs required to erect a network infrastructure. The regional consolidating mergers did typically generate real operating cost reductions but also significantly raised the new entry bar for potential local competitors. The cost reductions probably outweighed the new entry barriers, but one can't easily generalize: assessing the net value creation of regional-level consolidating acquisitions typically requires detailed case by case analysis – hardly the business of this article.

The second step -- linking together these regional monopolies into *national* (and occasionally international) networks -- presents a different economic calculus. Most national network markets are now characterized by quite tight oligopoly structures; and these structures are indeed usually traceable to the merging of regional monopoly networks. This national-level merger activity has probably produced some operational cost efficiencies (e.g. in billing and other back-office systems), but also no doubt also some scale diseconomies in managing complexity. The really big "cost reductions" flowing from nationalizing mergers, and the chief (though usually unspoken) motive for them, is the very considerable "*monopsony power*" they create vis a vis network equipment, value-added network service, and content publishing suppliers to the merged entities. *These* cost reductions do *not* constitute efficiency gains for the overall economy. Monopsony power over suppliers leads to allocational inefficiency in the broader economy, just as does monopoly power exercised vis-a-vis customers.⁴² Further, such monopsony power usually stimulates defensive horizontal merger activity among its victims. Consequently, nationalizing mergers of electronic distribution networks constitute an economic policy issue of considerable importance .

Cross-market (or "vertical") mergers raise a whole new set of policy issues. But these are the same issues raised by *unilateral* efforts to leverage monopoly power across market boundaries via tying arrangements and exclusive dealing practices; so we turn directly to the root phenomenon of cross-market leveraging of monopoly power.

D. The cross-market leveraging of monopoly power

⁴² Herbert Hovencamp, *supra* note 4, at 13-16.

A successful cross-market leveraging of monopoly power creates a second monopoly. This is unfortunate – but that new monopoly will often occur anyway, simply because the new market is full of network effects and closed standards. The real vice of monopoly leveraging, therefore, is that it threatens the *dynamic* competitive process of "creative destruction" – the disruptive obsoleting of established products and markets by entirely new ones. Leveraging permits a single company to control the pace and shaping of *new* market formation and evolution. The economic value created by "untamed" creative destruction is not readily quantified or graphed. That is why economists have traditionally been uncomfortable addressing it. But permitting a single firm to control the process -- to subordinate the course of creative destruction to the firm's own profit-making interests -- surely deprives the Industry of some of its long term potential to create value for the general economy. To detect and "measure" this deprivation would require writing complete "alternative histories" for the affected Industry markets – an intriguing but inherently speculative exercise. Still, it is hardly idle speculation to conclude that ceding the authorship of history to a monopolist is *in general* bad for economic value creation.

That said, actually spotting significant instances of the cross-market leveraging of monopoly power requires considerable caution. The vice cannot occur unless its alleged "perpetrator" possesses significant monopoly power in one market and uses that power as a unique (i.e. not duplicable) competitive asset (e.g. not just as a source of financial funding) to achieve monopoly power in a related market. Further, this does not necessarily require competing directly in the related market: in certain cases, dealing exclusively with an existing player in that market can do the trick. On the other hand, merely entering the related market, via internal product diversification or via merger, does not itself constitute leveraging. Such entry must be *accompanied* either by exclusive self-dealing or by tying together the firm's two products for exclusive joint sale; further, these steps must not be undertaken merely to reduce the firm's normal operating costs in serving two markets simultaneously, which is a normal and acceptable tactic that enhances overall economic efficiency, or merely to exercise indirect price discrimination in the first market, which is not clearly a bad thing from an economic point of view.⁴³

⁴³ Price discrimination enables a monopolist to convert a market's "consumer surplus" into monopoly profits. This is obviously resented by consumers. However, this conversion of consumer surplus into profit will also induce the monopolist to maximize her profits by supplying the same quantity of her product as a competitive market would supply, and therefore leads her to provide to the general economy the same "added value" as in the competitive case. So, from the distribution-neutral perspective of welfare economics, a perfectly price-discriminating monopoly is no less "efficient" than a perfectly competitive market model that involves the same cost of supply mathematics. Those opposing price discrimination purely on economic efficiency grounds therefore must ground their argument on the undeniable extra transaction costs involved in actually accomplishing price discrimination. When the price discrimination is accomplished via a forced inter-product tying scheme, a policy-maker might also postulate that consumers do not understand the full "after sale" costs they incur in buying that product; this defect in consumer understanding is a market imperfection in itself, though one best analyzed in terms of "deceptive practices" rather than as an instance of "cross-market monopoly leveraging". Such deceptive practices are arguably objectionable even if the "monopoly" in the tying product is itself non-objectionable because it is merely an instance of "brand-specific" monopoly power within a competitive inter-brand market. All these subtle and slippery considerations (and more) got themselves confusingly entangled in the Supreme Court's most noteworthy, or notorious, modern decision on inter-market tying arrangements, *Eastman Kodak Co. v.*

Taking account of all these caveats, it nonetheless is fairly easy to discern where the cross-market leveraging of monopoly power today poses significant problems in the Industry.

1. Leveraging monopoly power from distribution markets into publishing markets

Prominent combinations between distribution and publishing markets have occurred in cable and broadcast television (i.e. common ownership of broadcast networks and television program producers and of cable systems networks and cable content channels), in Microsoft's repeated efforts to develop "content" franchises for its platform software products (e.g. CDROM encyclopedias, PC-based educational and entertainment titles, games for its X-box video game platform, and proprietary content-rich channels within its MSN web service), in AOL's signature marriage of ISP service and proprietary Web content, and in AOL/Time Warner's marriage of myriad content franchises with both an ISP network and cable system services. The Industry has also begun seeing multiple music and movie publishers band together for joint ownership of "industry-wide portals" for Internet distribution of their digitized content, e.g. _____ and _____ for music distribution and movielink.com for video distribution. These initiatives combine the creation of potential monopoly power, though the act of co-ownership, with the simultaneous leveraging of this "cartel" power into a new distribution market.⁴⁴

The exclusive yoking together of distribution and publishing has indeed become a strategic fad throughout the Industry. For distribution companies, the stated business strategy rationale for capturing exclusive content is to "discriminate" a distributor's core products from its competitors. For content publishers, the rationale is to secure access to evermore concentrated electronic distribution channels. The practical effect all around, however, is to deprive new-entry publishers of distribution channels, to raise barriers to the independent, entrepreneurial development of new distribution technologies, and to encourage defensive consolidation among both distribution companies and publishing companies. One can imagine a "worst case" scenario where electronic information distribution and publishing become vertically integrated around a small number of very large oligopolies. An Industry with this profile would harbor considerably more monopoly power, in many more markets, than is evident today: the Industry would suffer

Image Technical Services, Inc., 504 U.S. 451 (1992). *See generally*: C. Shapiro, *Aftermarkets and Consumer Welfare: Making Sense of Kodak*, 63 *Antitrust L.J.* 483 (1995); Herbert Hovencamp, *Market Power in Aftermarkets: Antitrust Policy and Kodak Case*, 40 *UCLA L.Rev.* 1447 (1993); B. Klein, *Market Power in Antitrust: Economic Analysis After Kodak*, 3 *Sup.Ct.Econ.Rev.* 43 (1993).

⁴⁴ The potential for leveraging monopoly power across distribution and publishing market boundaries became a very prominent issue recently in debates about the acquisition of Time Warner by AOL. *See e.g.* Daniel L. Rubinfeld & Hal J. Singer, *Open Access to Broadband Networks: A Case Study of the AOL/Time Warner Merger*, 16 *Berkeley Tech. L.J.* (2001). Similar monopolizing potential arises whenever multiple vendors joint to launch and own a so-called "B-2-B" e-commerce portal. *See generally* Federal Trade Commission, *Entering the 21st Century: Competition Policy in the World of B2B Electronic Marketplace*, 7 *Trade Reg. Rep. (CCH)*, Para. 50, 176 (2000); Garen Gotfredson, *B2B Internet Purchasing Exchanges: The Promises and Antitrust Risks of a New e-Commerce Platform*, 2 *Minn. Intell. Property Rev.* 107 (2001).

a significant choking off of "unpredictable" creative destruction in both publishing and distribution.

2. Leveraging monopoly power across different "modes" of networked distribution

One frequently sees an established distribution network move into a new mode of distribution, e.g. where a telephone network company adds a cellular phone service or a cable television system service or a cable system provides voice communications or ISP services. These moves are attempts to anticipate shifts in customer preferences from one distribution mode to another, or to attract customers who want a single supplier for their various distribution needs. It is difficult to fault these motives or to deny to customers the convenience sometimes brought by such diversifying moves. Nor do such moves directly foreclose to independent distribution network services the means of reaching their intended customers. But, if the various distribution modes *each* has strong elements of "natural monopoly," a "single supplier" solution could end up facing many customers with a totally monopolized distribution universe. That is the conundrum which we must re-address in considering policy responses.

3. Leveraging monopoly power across types of software platform

This is of course the core "Microsoft problem" -- because cross-market leveraging of monopoly power quite obviously constitutes that Company's core business strategy.⁴⁵ Microsoft enjoys a near total monopoly in desktop operating systems and applications and has sought with skill and relentless energy to leverage those two unique assets into securing monopoly power in almost every (even remotely) related software platform, from server operating and data base management systems and server-based applications through non-PC client-device operating systems, every conceivable web-based software platform, web portals, and now the evolving architecture for all so-called "web services". This strategy is the best way for Microsoft *simultaneously* to defend /prolong its desktop monopoly against intrusion by new platforms *and* to grow swiftly and dominantly in emerging new markets, maximizing growth in the Company's revenues and profits. Were Microsoft *not* to pursue this logical business strategy would arguably breach its fiduciary duty to shareholders. Were public policy to *permit* such a strategy to succeed, however, would threaten the entire process of creative destruction throughout much of the Electronic Information Industry, with incalculable negative consequences for the Industry's economic value-added.

This particular clash between private strategic logic and Industry-level value creation is hardly unique to Microsoft. *All* software platforms generate indirect network effects, and the prevalence of "proprietary" connection standards in the Industry translates those effects into monopoly power for any leader in any software platform market. Every software company skillful, fast, or lucky enough to gain such monopoly power in one market seeks to leverage it into related platform markets. That is indeed "the name of the game" throughout the entire software industry; software companies all seek to become the "industry standard" platform in their particular market and then try to leverage that

⁴⁵ Regarding Microsoft's overall business strategy, see David Bank, Breaking Windows (2001).

monopoly position into ancillary software markets. Superior technology, marketing, branding, etc. are not irrelevant factors in the equation, but "home run" profit margins and revenue growth rates depend on the added factor of monopoly leveraging. This added factor can be removed only by the advent of open connection standards among software platforms or rigorous legal restrictions on the practice of cross-platform monopoly leveraging.

V. Policy Cures

The Industry's monopoly power "ailments" have no single source and therefore no single cure. On the other hand, economic value creation would hardly be served by endless "case by case" court rulings and micro-managing regulatory interventions. This would mean continuous, unpredictable, and intrusive government tinkering, at a huge cost in Industry time, money, management attention, and business certainty. The objective, after all, is to liberate the Industry for maximum economic value creation, not to convert it into a laboratory for legal experimentation.

The better approach is to focus on the most significant sources of Industry monopoly power and to address each with a minimal number of reasonably simple, "bright line" rules of structure or conduct. Such rules can do no better than very rough justice, but they can at least free *most* Industry resources to maximize economic value.

In this spirit, I offer here some highly immodest policy recommendations, proceeding again through the four sources of troublesome monopoly power. The reader will notice that I have not let "political doability" enter at all into the recommendations. Instead I have put premiums on economic logic and simplicity (goals which are themselves hard enough to balance and combine).

A. Government grants of monopoly

1. Intellectual Property

The diagnosis above itemized the many value-reducing effects of recent trends in intellectual property law. This diagnosis counsels reform three main areas.

- Copyright law should reverse its trend toward ever-increasing "protection", especially as regards software. This means reverting to much shorter copyright terms, narrowing protection for "derivative works", reviving a more robust domain for unprotected "ideas" (versus protected "expression"), and giving the "fair use" exception ample breathing room. I frankly despair of meaningful progress on any of these fronts. In the interim, however, Congress and the Supreme Court could at least give the Industry's innovative engines a boost by clearly freeing normal software "re-engineering" projects from copyright harassment.

- Congress should simply terminate patent protection of Industry software platforms. Leave this whole area to copyright law, and reserve patent protection solely for software components that are integral to "machines" whose uses lie outside the boundaries of the Industry. Some observers have urged instead a nuanced, if complex, judicial re-tweaking of various patent doctrines as these apply to software;⁴⁶ this would clearly help – but I fear it is no more likely, and would prove far more time consuming, than a single cleansing stroke by the Congress.
- Finally, Congress should retreat from the multi-front technology war that pits new DRM systems against peer-to-peer file sharing and the guerilla hackers who bore their way into DRM systems. Simply declare neutrality and get out of the way. No one can possibly predict who will, or should, win how much territory in this war . All of the combatants are disregarding the delicate balance of rights and interests that has evolved over centuries of copyright law evolution. (My own guess is that the overwhelming commercial needs of on-line publishers will impel powerful platform companies and network distributors to devise and deploy DRM systems that stay several steps ahead of the file sharers and hackers. But anyone's guess is just as good.) By keeping to the sidelines for now, the law can preserve its credibility until wisdom catches up with the unpredictable trajectory of this arms race. If one insists on a less agnostic stance than this, laws against the hacking of DRM systems should at least leave unprotected those systems that themselves simply erase the main features of traditional copyright law, e.g. allowance for the "fair use" of published poems and platforms, the ability to re-engineer DRM-protected software, and the clear right to use the "ideas" embodied in the DRM-shrouded content. Emerging DRM technologies are sufficiently flexible to accommodate these historic "content user" rights. Congress should limit its favor to DRM systems that achieve such flexibility.

2. Radio spectrum monopolies

The FCC should as quickly as possible permit new digital transceiver technologies to co-use spectrum resources as a "commons". This would greatly accelerate the evolution of new digital networks which, unlike traditional radio and TV broadcasting, could grow in a robustly competitive environment. The FCC would have to retain a role in "certifying" the non-interfering character of the new transceiver technologies, but this is a far simpler and less intrusive task than the complex rulemaking and adjudication that govern broadcasting and cable TV.

B. Natural ("inevitable") monopoly power

⁴⁶ Julia E. Cohen & mark A. Lemley, *Patent Scope and Innovation in the Software Industry*, 89 Calif. L. Rev. 1 (2001).

The diagnosis narrowed down the "natural monopoly" phenomenon chiefly to two big problems for law and policy: the "last mile" dilemma, and the Industry's lack of "open" standards for connecting together distribution networks, different kinds of software platform products, and platforms with publications and poems.

1. The last mile problem

The last mile in the U.S. is an arena for competing copper-wire DSL and cable-based technologies for "broadband" access to the Internet. Neither technology provides a technologically optimal solution. Several Asian countries are using various direct government subsidies and investment programs to deploy last mile broadband capabilities, including optic fiber.⁴⁷ Fiber is indeed the optimal solution, and these nations may quickly leapfrog the US in mass consumer and business usage of robustly broadband Internet content and services.

Perhaps the cost of fiber-laying can be somewhat mitigated by supplemental use of new wireless networking technologies (e.g. fiber to the "structure" or "neighborhood" and wireless access the rest of the way). But two realities would remain: laying the necessary local fiber will require massive investment, and the result will substantially obsolete today's copper wire telephone networks and head-end-centric cableTV networks. Therefore, neither of those elements of the Industry is likely to undertake extensive last mile fiber investment, at least anytime soon. Their shareholders and creditors would refuse to finance such a self-cannibalizing, if far-sighted, project. Nor is *any* private company or consortium likely to do so absent either a very big public subsidy or a government guarantee of plenary, long-duration monopoly power over the resulting fiber networks.

Between the alternatives of subsidy and state-granted monopoly, the first would be better for the economy. The whole point of achieving widespread broadband access is to provide a really fast highway to every information source, and every other communication network and service, for the nation's households and businesses. Plenary private control over access to third party services and content providers would defeat the whole reason to undertake the project. The project's capacity to create value for the general economy would remain substantially under-tapped for a long time. Better to wait until the public funds are available through traditional democratic processes (however economically "sub-optimal" these can be) than to botch the basic job.

2. Promotion of open standards

⁴⁷ On the use of direct government subsidies to promote "last mile" broadband access, see e.g. Jeunsoong An, *E-Korea DSL Policy: Implications for the United States*, J. Marshall J. Computer & Information Law 421 (2002).

The Industry's chief mechanisms of monopoly power are "closed standards" for linking together directly competing communications networks and for linking third party applications to networks or to software platforms. A closed standard permits one network or platform to "enclose" (i.e. privatize) all or most of the network effects inherent in the particular market and thereby to gain a durably dominant market share. A closed standard also enables a market-leading network or platform to leverage its dominance into adjacent applications markets, and – where those adjacent markets *also* are characterized by network effects – such leveraging becomes a plainly profitable strategy.

Therefore, public policy should champion "open standards". The questions for policy are *what kind of openness* and *how* government should promote its adoption.

There are two basic genres of openness: paid and free. In both cases, the market adopts a single, non-discriminatory connection standard for competing networks or for application access to competing platforms. This eliminates the wasted effort on all sides to write, maintain, and utilize multiple connection methods, and non-discrimination defeats efforts to leverage monopoly power into applications markets.

A regulated access or licensfee for using the open standard is appropriate either where free access would create an "overload" problem (the so-called "tragedy of the commons") or where competitors need a fee payment at some level (in effect a limited "monopoly profit") to incent "optimal" build-out of the entire market's network or platform capacity or functionality (the fee acting to eliminate the so-called "free rider" problem"). A fee-based standard is generally appropriate for connecting directly competing communications networks, because overload and free-riding are typical phenomena in such cases. Setting and policing the fee structure presents difficult technical and administrative issues for policymakers, but these are typically more manageable than instead focusing on regulation of the end-user fees that a "full monopolist" can "fairly" charge to its ultimate customers.

A "free" standard is, by contrast, generally appropriate for connecting third party applications to a dominant network or platform. Overload problems are much rarer in such cases, and neither platforms nor applications suffer from "free riding" effects by maximum applications access to all platforms. Such access instead enhances private value creation on all sides the equation.

Of course, dominant network and platform owners will strongly resist government promotion of open standards, claiming that such standards "rob" them of their "intellectual property" or their "core technologies". These arguments typically lack merit. Intellectual property protection is itself a government-granted privilege under U.S. constitutional law, not a dictate of "natural justice". And connection standards rarely require much "technology": they are usually very minor and mundane hunks of computer code. Their importance in the Industry is purely financial: they permit privatization of a market's inherent network effects. Government has no "obligation" to allow, much less

to facilitate, such privatization, any more than government is obliged to permit or facilitate cartelization of a market by agreements among its competing vendors.

There remains the hardly trivial dilemma of *how* public policy can best promote the evolution of open standards in the Industry. Open standards are scarce here not because Industry firms are "selfish and greedy": all firms in every industry are selfish and greedy. The basic obstacle to open standards in the Industry's is swift technological progress: connection standards require continuous tweaking to keep up with the technological innovation that continuously reshapes the Industry's products. A single firm can typically stay ahead of this curve of constant change much more easily than can a neutral committee of experts or a government regulatory body.

Still, there do exist impressive examples of successful "open " connection standards, e.g. the "universal ports" that now connect PC's to peripheral devices, the spreading domain of Internet standards and protocols, the application program interfaces of "open source" software products such as the Linux operating system and the Apache web server, and the communications protocols used by most mobile phone companies outside the United States.

The government can try to advance open standards "case by case" by bringing antitrust actions against particular networks or software platforms that have achieved and abused overwhelming monopoly power. But that is a slow, intrusive, and expensive approach to so pervasive a problem.

I would instead counsel resort to four more general avenues of reform:

- Government should more aggressively support vendor-neutral committees of standards experts – support expressed by government procurement policies for free open standards, by explicit government endorsement of expert committee recommendations, and also, if selectively, by outright subsidization of the committees. There is of course a risk that the government and the committees will too quickly settle on technically "sub-optimal" standards. But getting *some* standard in place quickly almost always generates more economic value than does lengthy inter-vendor haggling and game playing in pursuit of the ever-elusive "optimal" standard.
- Government should, by new legislation, simply deny intellectual property protection to "third party" connection standards for applications access to software platforms and communications networks.
- Government similarly should withhold or withdraw intellectual property protection from *entire* products and services whose owners refuse to publish, keep up-to-date, and fairly administer (at least) for-fee open connection standards for "third party" users.

- Government should cheerlead "open source" software projects.⁴⁸ These go beyond "open standards" to liberate entire products from private ownership. There is little risk of or need for placing the entire software industry into the public domain! But open source products do help discipline the pricing and behavior of their private competitors and greatly expand the range of consumer choice.

C. Horizontal combination

The main problem here is the merging of regional monopolies into national networks in radio/TV broadcasting, cable systems, and telecommunications services. These nationalizing mergers are worrisome chiefly because they create *monopsony* power vis a vis the resulting national networks' suppliers, i.e. network equipment companies, providers of value added network services, and – most consequentially – content publishers. I believe the Justice Department and the FCC have failed to take this monopsony threat sufficiently into account in considering such mergers, e.g. those that

- originally created the national broadcasting networks
- created the huge Time Warner and Comcast cable systems companies
- have shrunk drastically the number of RBOC's
- may soon attend the extension of the RBOC's into nationwide long distance telecommunications services
- will create a higher national market share for already-formed national TV and radio broadcasting networks under recently liberalized FCC regulations.⁴⁹

In all these cases, debate focused on the consumer or editorial diversity impacts of the nationalizing merger trend. There are decent arguments on both sides of that debate, but there seems to me little doubt that these mergers have all increased significantly the monopsony power of the resulting networks on all their "suppliers" – and most consequentially on their suppliers of content programming and related value-added services.

No significant innovation in prevailing antitrust doctrine is needed to address this threat: the benchmarks governing horizontal mergers and joint ventures are among antitrust law's few areas of relative clarity and sophisticated detail⁵⁰ and the law has long recognized monopsony and monopoly power as equivalent vices. I concede, however, that the cat is largely out of the bag as to the formation of these large national networks. I

⁴⁸ For a history of the open source movement, see Glyn Moody, Rebel Code: Linux and the Open Source Revolution (2001). On the clever inversion of conventional copyright rules represented by the General Public License often used on open source products, see David McGowan, *Legal Implications of Open Source Software*, 2001:1 Univ. Ill. L. Rev. 241 (2001).

⁴⁹ Cite to relevant FCC decisions.

⁵⁰ See e.g. *Justice Department/FTC Guidelines on Horizontal Mergers*, 57 Fed. Reg. 41552 (September 10, 1992), 4 Trade Reg. Rep. (CCH) Para. 13,104 (1992).

will therefore simply note that the resulting monopsony threat gives added force to the immodest recommendations offered below regarding the cross-market leveraging of monopoly power.

D. The cross-market leveraging of monopoly power

As noted above, leveraging monopoly power into related markets is a core strategy for most software platform companies and, increasingly, for large distribution and publishing companies peering uneasily across the basic "functional" market boundary that separates them.

Leveraging is a baleful practice because it permits companies to "privatize" the otherwise discourteously disruptive process of creative destruction by which the Industry spawns revolutionary new distribution technologies and content publishing models that exploit these technologies.

Leveraging "works" in this Industry because so many of its distribution markets produce network effects, which the Industry's shortage of "open" standards permits companies to convert into monopoly positions. The leveraging problem would largely vanish if open standards were prevalent across the Industry – but such is not yet the case.

The current legal framework for cross-market leveraging is a muddle: weak and indifferently enforced vertical merger guidelines, and unsettled and confusing antitrust doctrines applicable to exclusive and preferential dealing, product tying arrangements, and attempts to monopolize new markets⁵¹ – the typical tactics of leveraging. The whole

⁵¹ Unfortunately, the Microsoft antitrust litigation in the U.S. and Europe has not, at least as yet, moved the law on monopoly leveraging toward greater simplicity and clarity. In two respects, the ruling opinion of the D.C. Court of Appeals has instead created yet new complexities:

- The Court drew a labored distinction between illegally defending a monopoly in the base market and illegally seeking like monopoly power in the related market, *U.S. v. Microsoft*, 253 F.3d 34, at 81-84 (2001), though both occurred here simultaneously by using the same cross-market leveraging tactics (e.g. exclusive dealing and product tie-in's), in service to a single business strategy. Apparently the second offense, but not the first, requires that the government *define* the related market. The reason for this difference is a mystery, at least to this observer.
- The Court held that product tie-in's in the "software industry" should be litigated case-by-case under the "Rule of Reason", involving an unstated number of "balancing factors", rather than the "per se" rules that remain applicable in other industries. This, the Court said, is because software is a new and technological complicated industry. *Ibid.* at 94-96. In fact, the *relevant economics* of the software business are not complicated: software markets are marked by the coincidence of closed standards and network effects, which makes the emergence of monopoly power nearly "inevitable" and makes its cross-market leveraging highly profitable. Litigating these economic realities de novo, case by case, will prove a waste of everyone's time and make the practical conduct of software businesses unnecessarily costly and uncertain.

field needs a thorough legal re-vamping, aimed at establishing a few "bright line" rules that could significantly retard the Industry's strong leveraging tendencies. I will here suggest three immodest recommendations for doctrinal reform, freely conceding that each would need extensive detail work.

- We should effectively ban -- where needed via legislation -- the vertical integration of distribution and publishing in the Electronic Information Industry. This would with a single stroke free up different distribution modes and platform products to compete on their own merits, liberate publishing generally from distribution barriers to entry, assure healthy growth of new publishing brands and products, and obviate the felt need for "defensive" consolidations in publishing.
- Antitrust law should recognize a very strong, if case-by case rebuttable, presumption that dominant market players may not deploy long-term exclusive or self-preferential deals or product tie-in's between distinct platform markets or between technologically distinct networking modes. Such a rule would permit distributors to enter unilaterally (though not typically by merger), and to compete freely in, related distribution markets – but only if they treated "their" products on an even playing field with their competitors in the new markets. Preferential treatment of their own products, however accomplished, would be compelling prima facie evidence of abusing their core monopoly power.
- Where a court cannot easily manage to police preferential self-dealing across markets by a dominant platform company – which is frequently the case – the court should not be reluctant to deploy the remedy of structural divestiture. Companies themselves undertake such restructuring frequently throughout the economy; the surgery is not nearly so drastic or fraught with costs or risks as antitrust courts frequently assume.⁵²

VI. Conclusion

This essay used the basic tenets of welfare economics to diagnose the sources of monopoly power in the Electronic Information Industry, and then to recommend several major changes to the Industry's framework of law and policy.

The paper segmented the Industry into its authoring, publishing, and distribution functions. The welfare economic concepts used here were novel only in stressing

⁵² It is likely that the divestiture remedy ordered by the trial court in the Microsoft case was vacated on appeal in part because the appellate court thought corporate divestiture a drastic and very risky undertaking – which is simply not so. U.S. v. Microsoft, *supra* note 51, at 106-107. On divestiture remedies, see Thomas Sullivan, *The Jurisprudence of Antitrust Divestiture: The Path Less Traveled*, 86 *Minn. L. Rev.* 565 (2002); Thomas M. Leonard, *Creating Competition in the Market for Operating Systems: Alternate Structural Remedies in The Microsoft Case*, 9 *Geo. Mason L. Rev.* 803 (2001); R Craig Romaine & Steven C. Salop, *Slap Their Wrists? Tie Their Hands? Slice Them Into Pieces? Alternative Remedies for Monopolization in the Microsoft Case*, 13 *Antitrust* 15 (1999).

"creative destruction", a dynamic, cross-market process not often formally considered in conventional micro-economic analysis.

The diagnosis isolated as particularly important sources of monopoly power: extensive protection of intellectual property and radio spectrum monopolies, the Industry's widespread use of "closed standards" to "privatize" the strong network effects that characterize most of the Industry's distribution markets, the formation and extension via merger of national-scale distribution networks, and the prevalence of cross-market leveraging of monopoly power across distribution markets and between distribution and publishing markets.

The policy changes recommended are immodest and plainly not candidates for political popularity in the Industry:

- Less protection for intellectual property and for radio spectrum monopolies
- Aggressive government promotion of open standards
- Closer scrutiny of nationalizing mergers among distribution networks.
- A ban on co-ownership of distribution and publishing properties
- Stringent limits on cross-market leveraging tactics across electronic distribution technology markets

These reforms would be resisted by the Industry's most successful players, or their shareholders and creditors, because these firms enjoy considerable monopoly profits under current regimes of law and policy. The reforms would also find little favor among economic nationalists, because most of these Industry-leading firms are headquartered in the U.S.

Such reforms would, however, help the Industry grow faster and contribute more value to the overall U.S. and world economies. It is true that the reforms would very likely shift the balance of the value created toward consumer surplus from the supplier profit category: this is "good" or "bad" depending on one's distributional preferences. The welfare economic baseline is simply that the reforms would expand the *total* value created over time. That goal, I believe, remains the only respectable and conceptually coherent basis for any body of competition law.

