

Open Source Software, the Wrongs of Copyright, and the Rise of Technology

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The popularity of computers, spread of the Internet, and changing attitudes of some technologically minded individuals are together challenging ceremonial business practices. This challenge comes in the form of open source software which, contrary to hundreds of years of business practice, gives consumers the right to a good free of charge.¹ These technological advances are economically efficient but, by challenging the status quo, are nonetheless controversial and are engendering harsh responses from vested interests. This paper examines the challenges posed by this ongoing trend and the broader conflict between efficiency and profit-seeking behavior.

Copyright Law and Its Increasing Incongruity

Most economic analysis of copyright suggests that, from its inception, copyright law has represented an uneasy balance between monopoly power and economic efficiency. As William Landes and Richard Posner noted, “Copyright protection—the right of the copyright’s owner to prevent others from making copies—trades off the costs of limiting access to a work against the benefits of providing incentives to create the work in the first place. Striking the correct balance between access and incentives is the central problem in copyright law” (1989, 326). Richard Watt echoed this conclusion: “It is a most

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difficult exercise to decide which of the two sides of the intellectual property market is more deserving, and hence to set a socially efficient level of protection” (2000, 11–12).

Copyright profits are often defended as a right or a necessary evil. Several theorists, however, attack copyright in part or in whole. Stephen Breyer summarized the “moral justifications for copyright protection” as resting on the belief that authors have a “natural right” (1970, 284) to profit from their works; he then skewered this belief on several fronts, primarily by arguing that authors have no greater right to be paid sums above their “persuasion cost” than do most other workers, who are routinely paid less than the total value of their output (284–291). (In the economist’s terms, Breyer’s argument is that copyright is merely a tool for creating economic rent.) And while some may suggest that creative works are qualitatively different from other goods and services and hence deserve greater rewards, Breyer countered that such high returns will disproportionately encourage production of popular (i.e., lowbrow) output over “serious and important works” and further that the resulting higher prices will reduce dissemination of the more worthy intellectual properties. Breyer’s refutation of the moral arguments for copyright thus contains two strands: that copyright creates disparate and inequitable rewards in the labor market and that it creates inefficient and inferior outcomes in the markets for intellectual properties.

Breyer also attacked the “necessary evil” argument for copyright on several fronts.² He concluded that, in the book market, eliminating copyright would have varying impacts on publishers’ (as opposed to authors’) earnings depending on the copiers’ cost advantages, the possibility of retaliation from initial publishers who may punish copiers by ultimately selling books at prices below copying costs, and the initial publisher’s advantage in first bringing the book to market and hence earning revenues before copies become available (1970, 294–302).³ Breyer’s last point draws heavily from an article by Arnold Plant, who argued that copyright protection was an unnecessary entry barrier given that a work’s creator would have adequate time to earn returns before other market entrants eroded the creator’s advantage (1934).

With analysis dating from 1934 and focusing on the market for books, Plant’s conclusion needs refining in this age of digitization and the Internet. Given the many recent high-profile cases of songs and motion pictures becoming available for illegal downloading before their commercial release dates, it seems clear current technology has, in many milieus, negated the first-mover’s advantage. Nevertheless with software, proprietary restrictions on source code help secure this advantage. Software (the binary code) can be copied and distributed with great ease and negligible costs. However, without the source code, pirates and other competitors are substantially prevented from customizing the software or developing an improved future generation of the program.

For all digital information with marginal costs of dissemination approaching zero, free distribution is, in the short run, allocatively efficient even though it infuriates copyright holders and elicits claims that the production of such properties will eventually cease as profit-making opportunities whither. If this were definitely the case, then one could reasonably argue such distribution schemes are truly against the public interest,

defined as long-run technological progress. If, however, sufficient intellectual properties were forthcoming even when copyright holders were unable to reap economic rents by restricting dissemination, then we might reasonably view those copyright holders as pursuing ceremonial ends by blocking instrumental gains for society.

Open Source Code and the Rise of Technology

While many artists—whether expressing themselves through novels, films, photographs, or other media—would (and often do) continue creating new works even without the possibility of substantial economic reward, some classes of creative people who have not traditionally been considered “artists” have not only maintained production in the face of widespread copying but have, in fact, rejected the process of copyright in favor of more instrumental and economically efficient (in the mainstream sense) production and distribution mechanisms.

Open source software is software with no user fees and whose source code is publicly available so programmers can modify, extend, and debug it. The open source movement has created a wide variety of high-quality software that is useful, reliable, and inescapable in the world of computing. Prominent examples of the thousands of open source projects include Apache, which runs on the majority of the Internet’s web servers, and GNU-Linux, a popular alternative to the proprietary Unix operating system. Recently, in touting its growing partnership with Linux, IBM adopted the marketing slogan “The Future is Open.”

It is stark testimony to the way our economy shapes habits of thought that sharing valuable software free of charge seems so striking, startling, or even rebellious.⁴ Certainly, there is nothing in our genes or in the logic of social interactions that prohibits sharing. Sharing and cooperation are indispensable parts of our history and culture. Yet, in a culture built around an economy based on ideals like acquisitiveness, individualism, competitiveness, and materialism, the open source movement will seem an odd fit with our usual patterns of social articulation.

The tradition of sharing software, programming advice, and bits of code coevolved with the spread of computers. In the days when computers were exotic and found only in universities, large corporations, and government agencies, user groups sprang up—and were even coordinated by IBM—to facilitate cooperation and prevent programmers widely separated by geography and discipline from having to reinvent the wheel each time one of them encountered a challenge similar to that which had been successfully overcome by others. Part of this custom stems from the academic tradition of sharing and publishing research. Part of it stems from a pragmatic, instrumental drive to improve quality and reduce effort by seeking and offering help. The custom has been defended and reinvigorated by high-profile advocates of the open source movement like Richard M. Stallman. During the 1970s, Stallman was a top programmer at MIT’s Arti-

ficial Intelligence Lab. Now he is famous for being the founder of the Free Software Foundation and the father of GNU.

The open source movement is interesting as yet another example of computers and the Internet changing fundamental aspects of the economy. The movement manifests an ongoing revolution in our conception of private property—the quintessential institution of an industrial market economy.

Shades of Veblen

Interestingly, there are strong Veblenian themes in the open source movement. Unlike the orthodox assumption that the quest for profits yields greater efficiency, Thorstein Veblen argued that pecuniary interests often lead to the systematic withdrawal of efficiency: “The economic welfare of the community at large is best served by a facile and uninterrupted interplay of the various processes which make up the industrial system at large; but the pecuniary interests of the business men in whose hands lies the discretion in the matter are not necessarily best served by an unbroken maintenance of the industrial balance” (1904, 19). Instead, Veblen argued, gain came from the breaks in a system—its interstitial adjustments.⁵ “Gain may come . . . whether the disturbance makes for heightened facility or for widespread hardship.” When it comes to business, “[t]he end is pecuniary gain, the means is disturbance of the industrial system.” This is precisely the business strategy made possible by current copyright laws.

Open source advocates such as Stallman have argued that “[e]xtracting money from users of a program by restricting their use of it is destructive because the restrictions reduce the amount and the ways that a program can be used. This reduces the amount of wealth that humanity derives from the program” (1985). Echoing Veblen, he went on to describe this foreseeable consequence of the prevailing business model as “deliberate destruction.” Indeed, this is very much the heart of the open source argument. Copyrights sabotage the substantial benefits of standardization. “Modern industry has little use for, and can make little use of, what does not conform to the standard” (Veblen 1904, 11). In this case, the issue is standard software. If this standard is proprietary and programmers do not have access to the source code, then the endless variety of extensions and applications possible all have to be generated by the software’s corporate owner. Since even the largest corporation’s programming capacity is small compared with that of all its potential customers, the number of useful applications and extensions will be retarded. Additionally, the resulting evolution of the software will be shaped by pecuniary concerns which may or may not correspond to instrumental criteria. One can easily imagine applications in education or the arts foregone because they are less lucrative. The restrictions of proprietary software are believed to be especially damaging when it comes to framework software, such as operating systems, which enables the use of other software and is used by virtually everyone. Open source advocates argue all such software should be open source the same way communication and routing protocols for

the Internet and its precursors have been in the public domain (Lohr 2001, 209). Economists might describe this conviction as a desire to keep a natural monopoly from extracting monopoly rents via artificial scarcity.

In another Veblenian theme, Stallman echoed the instinct of workmanship when he wrote that lower profits will not mean the end of programming because “[p]rogramming has an irresistible fascination for some people, usually the people who are best at it,” and that creativity “is a reward in itself” (1985). Perhaps the most obvious Veblenian theme is in the contrasting roles of (software) engineers and business leaders as outlined in Veblen’s famous dichotomy. The engineers are interested in creating and problem solving. “The internet . . . allows programmers to share ideas, suggest improvements, and fix bugs in a far more effective way than could be done in the closed-shop setting inside a single company. The engineering champions of open source believe the world’s best programmers will coalesce around the software challenges that interest them, each contributing, stimulated by his or her peers, and a ‘meritocracy of code’ will result” (Lohr 2001, 205). They point to the creation of the widely used Apache as an example of such efficiency and quality. Its simple elegance, a programmer explained, was made possible because its features were “dictated out of necessity and not driven by attempts to win a marketing war” (208).

Firms’ ceremonial values, in this regard, are perhaps most evident in their rent-seeking attempts to defend and expand the outdated system of copyrights. As discussed above, optimal copyrights would strike a balance between the ills of a temporary monopoly and the benefits of encouraging original works. Article I, Section 8, Clause 8 of the U.S. Constitution gives Congress the power to “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.” Importantly, any benefits to individuals or corporations from such monopoly grants are a means to the end of elevating general welfare through the advancement of science (*Eldred v. Ashcroft*, 537 U.S. 1 [2003]). Moreover, the monopolies are intended to be temporary. These monopolies can reasonably be described as a form of corporate welfare funded by a tax (higher prices) on users.⁶ Constitutionally, the urgency of promptly terminating these rents stems from recognizing the benefits of competition and from realizing the issue is not simply one of economic regulation but a “regulation of expression,” a serious matter in a “[n]ation constitutionally dedicated to the free dissemination of speech, information, learning, and culture.”

While, in an age of lightning-fast copying and distribution, first-mover benefits may not be sufficient to eliminate the need for copyrights altogether, these benefits—such as name recognition and a head start on producing improvements and extensions—can be secured by a very short period of copyright protection. Additionally, we have argued elsewhere that the short product life cycle of many goods—such as works of music, or, in this case, software—also demands optimal copyright periods be brief (2001). The arbitrary periods chosen by Congress undoubtedly far exceed the optimal. Unfortunately,

the trend has been to lengthen these periods of monopoly inefficiency. While the original protection period was fourteen years (renewable once), it was extended in 1831, 1909, 1976, and 1998. The 1976 Copyright Act extended the term to fifty years after an author's death. The 1998 Copyright Term Extension Act (CTEA) generally extended this to seventy years after an author's death—including a retroactive extension for works already created.

While economics can explain this rent-seeking trend, it cannot justify it. Such lengthy periods are not efficient, temporary, or necessary to promote the advancement of science. Economic theory strongly supports Justice Breyer's dissenting opinion for the CTEA test case (*Eldred v. Ashcroft*). While not necessarily using economics jargon, Breyer argued the CTEA (and, we may argue, copyright law in general) ignores basic economic principles like diminishing marginal utility, opportunity cost, optimal balance between costs and benefits, present value, and the importance of reducing transactions costs. For example, a team of economists headed by George Akerlof estimated that the value (using certain conservative assumptions) of a copyright under CTEA is "slightly more than 99.8 percent of the value of a perpetual copyright" (*Eldred v. Ashcroft*).⁷ To cite another example, a Congressional Research Service (CRS) study determined that "only about 2 percent of copyrights between 55 and 75 years old retain commercial value" (*Eldred v. Ashcroft*). Under CTEA, copyright restrictions could last 100 years or more; the percentage of works retaining commercial value after such long periods of time must be substantially lower than 2 percent. That means the transactions costs of tracking down the copyright holder and seeking permission to use a work far exceeds the commercial value of the overwhelming majority of such works. These legislation-induced transactions costs are therefore a substantial and unjustifiable barrier to the free flow of information.⁸ On their face, current copyright laws, with radically long terms which are relevant for only the slightest minority of works, are not so much an instrumental attempt to secure advances in the sciences as they are a ceremonial instrument wielded by corporations to squeeze every last cent of monopoly rent out of consumers.

Conclusion

While rent seeking and the abysmal failures of copyright law in a digital economy are clear under institutional and orthodox theory alike, institutionalists are particularly well equipped to handle these issues. As digitized information becomes an increasingly large part of the economy, new realities are challenging the very nature of our past-binding, coal-and-steel era conceptions of scarcity, property, consumption, and production and of profit as the unchallenged engine of the economy. Institutionalists have a hundred-year history of skeptical scrutiny of these very same notions. At the same time, institutionalists understand that in any age there is no greater obstacle to a clear analysis of contemporary challenges than a culture's own habits of thought.⁹ One can talk about property and scarcity and how digital information presents challenges because of its

externality, common property, and public-good characteristics, but increasingly these are just old-economy metaphors describing a world that day by day grows qualitatively different from the worlds of Adam Smith or Arthur Pigou. It seems clear that in the area of copyrights (at the very least) Congress and the Supreme Court are headed in exactly the wrong direction. It is also clear that much of this can be explained by their clinging to a mythical ideal of an industrial economy rife with competition but devoid of power and strategic behavior. It is a view of the economy, Veblen explained, wherein the entrepreneur's "function is held to be the coördinating of the industrial process with a view to the economies of production and heightened serviceability." "The soundness of this view," Veblen continued, "need not be questioned. It has great sentimental value and is useful in many ways. There is also a modicum of truth in it as an account of the facts" (1904, 25). But where half-truths end, delusion and bad policy begin. If the full promise of the digital revolution is to be realized, institutionalists must do their part in speaking out against the ceremonial adherence to old-economy ideals and outdated institutions.

Notes

1. Open source refers to software's source code. Software, as it is commonly distributed, is only the binary code read by computers. Source code is meant for people, not machines. It is the documentation and programming that allows programmers to understand the details of the software's design.
2. Thirty years later Stephen Breyer, now a Supreme Court justice, is still critical of necessary-evil arguments. Writing on the most recent extension of copyright periods, he has succinctly stated that "its practical effect is not to promote, but to inhibit, the progress of 'Science'—by which word the Framers meant learning or knowledge" (*Eldred v. Ashcroft*).
3. Copiers' cost advantages, for example, would be higher in the cases of textbooks with complicated graphics and lower in the case of trade books. Breyer attributed the possibility of retaliation to Plant 1934 (173).
4. Josh Lerner and Jean Tirole (2002) have argued, and not without reason, that economists, at least initially, would find open source startling. *Rebel Code* is the name of a book on open source by Glyn Moody (2001).
5. Veblen argued the ability to glean profits from efficiency-curtailling disruptions was especially "true as regards those greater business men whose interests are very extensive" because their fortunes are tied to adjustments within the broader system as a whole rather than "the smooth working of a given sub-process" (1904, 19). It is no surprise then that the open source movement is sometimes seen as a war between freethinking programmers and giant software companies.
6. In his dissenting opinion in *Eldredge v. Ashcroft*, Justice Breyer approvingly quoted a description of the logic of behind the Copyright Clause as a "tax on readers for the purpose of giving bounty to writers."
7. This estimate assumed that the author lived for an average of twenty-five years after creating the work so that the copyright period lasted ninety-five years. Breyer adapted this analysis by including a decay rate (the percentage of works that become commercially unavailable in a year) estimated by the CRS and argued that, conservatively, a ninety-five-year copyright is more like 99.996 percent of the value of a perpetual copyright.
8. Breyer made an important distinction between the creation and dissemination of creative works and argued that the Constitution assumed "it is the disappearance of the monopoly

grant, not its perpetuation, that will, on balance, promote the dissemination of works already in existence" (*Eldred v. Ashcroft*). In this regard, short periods of copyright protection are necessary from both an economic efficiency and a First Amendment perspective.

9. Compare this principle of institutionalism with Richard Stallman's observation that, for open source critics, the appeal of current laws is not the laws' unassailable logic and morality but their reinforcement of "a habitual mental pathway" (n.d.).

Sources

- Breyer, Stephen. "The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs." *Harvard Law Review* 84, no. 1 (December 1970): 281–351.
- Gallaway, Terrel, and Douglas Kinnear. "Unchained Melody: A Price-Discrimination-Based Policy Proposal for Addressing the MP3 Revolution." *Journal of Economic Issues* 35, no. 2 (June 2001): 279–287.
- Landes, W., and R. Posner. "An Economic Analysis of Copyright Law." *Journal of Legal Studies* 28 (1989): 325–363.
- Lerner, Josh, and Jean Tirole. "Some Simple Economics of Open Source." *Journal of Industrial Economics* 50, no. 2 (June 2002): 197–234.
- Lohr, Steve. *Go To*. New York: Basic Books, 2001.
- Moody, Glyn. *The Rebel Code: The Inside Story of Linux and the Open Source Revolution*. Cambridge, Mass.: Perseus Publishing, 2001.
- Plant, Arnold. "The Economic Aspects of Copyright in Books." *Economica* 1, no. 2 (May 1934): 167–195.
- Stallman, Richard. "Why Software Should Not Have Owners." <http://www.free-sot.org/literature>.
- . "The GNU Manifesto." 1985. <http://www.free-sot.org/literature/>.
- Veblen, Thorstein. *The Theory of Business Enterprise*. New York: Mentor, 1904.
- Watt, Richard. *Copyright and Economic Theory*. Cheltenham: Edward Elgar, 2000.

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