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**INTELLECTUAL PROPERTY RIGHTS
IN FRONTIER INDUSTRIES:
SOFTWARE AND BIOTECHNOLOGY**

Edited by Robert W. Hahn

Over the last few decades, traditional manufacturing companies have given way to new service-based ones, and pundits often use phrases like the “information age” and the “knowledge economy” to describe the marketplace today. The modern version of the Horatio Alger story is likely to be the Bill Gates story: a good idea can take you a long way.

New knowledge-based businesses do not rely on physical capital as much as they do on human capital—the knowledge and ideas that their employees generate. With this increased emphasis on “intellectual property” has come renewed interest in—and controversy over—systems of intellectual property protection, especially patents.

Software and biotechnology are two of the most dynamic, fast-growing sectors at the forefront of the knowledge economy and its intellectual property controversies. Ensuring strong incentives for innovation in these key industries is not just a matter of academic debate; doing so has real implications for economic growth.

Despite the stakes—or perhaps because of them—the academic community has reached little agreement on how to spur innovation in these fields without inhibiting follow-on research or denying the public access to the fruits of technological change. Some argue that strong intellectual property rights in these industries create a “patent thicket”(a case of patents building up quickly and blocking subsequent invention in a given area) that only the most seasoned industry veterans can navigate, and even then at great cost. Others point to the dearth of evidence that patent thickets actually exist. They make for nice theory, but where is the proof?

Intellectual Property Rights in Frontier Industries: Software and Biotechnology (AEI Press, April 2005) tackles these thorny issues. Editor Robert W. Hahn, AEI resident scholar as well as cofounder and executive director of the AEI-Brookings Joint Center for Regulatory Studies, has collected six thoughtful essays on the intellectual property controversy in two of today’s key knowledge-based industries. The contributors express their views on how the current system is faring in the information age and how it might be improved. The analysis includes both legal and economic points of view. It offers valuable insights on intellectual-property-protection rules in an information economy and provides much needed perspective on how to solve some of the more pressing issues.

Contributors include **Dan L. Burk**, Oppenheimer, Wolff & Donnelly Professor of Law at the University of Minnesota Law School; **Iain M. Cockburn**, professor of finance and economics and Everett W. Lord Distinguished Faculty Scholar in the School of Management at Boston University; **Wesley M. Cohen**, Frederick C. Joerg Professor of Business Administration and professor of economics and management, Fuqua School of Business, Duke University; **Stuart J. H. Graham**, J.D., Ph.D., assistant professor of strategic management, College of Management, Georgia Institute of Technology; **Mark A. Lemley**, director, Stanford Center for Law, Science and Technology and William H. Neukom Professor of Law at Stanford Law School; **David C. Mowery**, William A. and Betty H. Hasler Professor of New Enterprise Development, Walter A. Haas School of Business, University of California, Berkeley; and **Arti K. Rai**, professor of law at Duke University School of Law.

Key Points

- Key questions about the institutional framework protecting intellectual property—such as whether patents actually increase innovation—have yet to be answered satisfactorily. Calls for drastic changes to the current system should meet with skepticism until more empirical evidence is available.
- Software and gene sequences are now among the patentable subject matter, for better or worse. The most productive debates center on modifications to how patents are issued, not whether they should be issued.
- The jury is still out regarding software patents: Stuart Graham and David Mowery note that “little evidence suggests that increased patenting has been associated with higher levels of innovation in the U.S. software industry, and equally little evidence suggests that increased patenting has proven harmful to innovation in this important sector of the ‘post-industrial’ economy.” However, little empirical research has been done on this issue thus far.
- Dan Burk and Mark Lemley suggest reforming the structure of software patents: the public would be better served by having industry provide more detail on each patent disclosure, but with a lower standard for determining whether the patent contains a truly novel idea. This could result in a greater number of software patents with narrower scope and higher information content. In other words, they recommend creating exactly the opposite of today’s system. This reform would be best implemented through the courts.
- “Bioinformatics” combines software and biotechnology, and thus suffers from the patent problems of both fields. Iain Cockburn points out that patent filers exploit the differences in standards for disclosure, non-obviousness, and scope across the two fields, describing an invention as either software or biotechnology to gain the desired standards. Consistent standards are needed here.
- In another hybrid field, open biology research borrows a page from open-source software like Linux and loosens restraints in the biology research process. While this might seem like an unequivocally good thing, Arti Rai illustrates why it has serious implications for publishing research findings and attracting top research talent.
- How research is conducted affects a whole host of issues ranging from researcher motivations, to the extent of technology diffusion, to the overall level of innovation. Wesley Cohen suggests that practitioners examine the conditions that make open-source research workable for specific sorts of software before extending the model broadly to biological research.