

EMERGING NEEDS FOR INCLUDING INTELLECTUAL PROPERTY EDUCATION AND RESEARCH IN UNIVERSITY CURRICULA

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1. Introduction

In this paper I present some reflections about the need for additional emphasis on university instruction in intellectual property (IP) issues and the training of scholars to undertake research in the area. In the United States there has been relatively little attention paid to these questions in economics departments and business schools, except perhaps as a module of graduate courses in the economics of technology or asset management. Indeed, American graduate schools (other than law schools) do not turn out specialists in IP research and teaching, as opposed to broader areas such as international trade and industrial organization, though some students may devote particular attention to IP problems in their research programs.

This situation reflects two interrelated factors, discussed further below. First, IP is construed within economics and business to be a particular form of commercial regulation or management techniques that are aimed, along with other forms, at achieving certain social or market-based objectives. Accordingly, IP is a tool (albeit a powerful one) within a broader set of policies and concerns. Courses are more likely to be organized around the broader issues of trade, development, or asset management with some analytical focus on the role of IP included as a module. Second, economists have a gross, even naïve, conception of what IP is and how it works. The vast majority of economic papers that analyze the role and impacts of IP are really about patent protection, meaning exclusive rights to use a commercially useful idea for a fixed period of time. "Patents" are represented by single parameters governing length or scope, without much consideration of the subtleties of novelty and utility standards. Very few analytical papers even recognize that trademarks, copyrights, and trade secrecy laws

operate quite differently from patents and these latter elements generally are not taught in economics courses.

These *lacunae* are becoming increasingly glaring in light of the growing importance of IP policies across a comprehensive set of areas of inquiry. Within economics, IP has been shown to be an important factor in decisions regarding international trade, foreign direct investment, and licensing, while it has significant implications for the development of new businesses and the potential for economic development. Emerging IP regimes also raise a number of fundamental questions about the ability of governments to procure basic public goods for their citizens at reasonable cost.¹ Within business, the importance of IP rights management and proper valuation of trademarks and patents grows ever larger as economic activity continues to shift into information generation and technology trade. Such questions have important implications for tax policies as well, but in my experience courses in tax accounting pay relatively little attention to them. Neither do engineering programs offer much training in IP issues, referring would-be inventors to other disciplines for information.

The major exception to this limitation is that many U.S. law schools offer extensive courses in IP law, even broken down into patents, copyrights, and trademark doctrines. While such courses are often taught by private practitioners, a few major law schools offer faculty with primary research and teaching interests in IP and it is from these schools that new generations of scholars are emerging.

One result is that IP scholarship tends to be heavily legalistic in nature. In my view it would be beneficial to continue existing trends toward integrating law, economics and business into more seamless scholarship and, even more, into coordinated courses at the graduate level. However, the technical hurdles in achieving such integration cannot be denied, as students and faculty would enter the courses with varying backgrounds and aspirations. Thus, there is scope for imaginative thinking for pushing forward an integrated agenda of teaching and scholarship, at least in a few institutions that may have the resources and interests to pursue it. I would argue also for making access to such courses as wide as possible on an international scale, in order to permit students from developing countries to achieve a sophisticated understanding of IP and a capability to research relevant aspects of IP.

2. How is IP Taught in the United States?

A quick examination of the departmental websites of six top U.S. universities unearthed the following items.² First, no economics department offers a course specifically aimed at teaching IP, either at the undergraduate or graduate level. At the same time, each department's graduate courses in industrial organization and regulation made reference to numerous areas of strategic analysis, such as price differentiation,

¹ The contributions in Maskus and Reichman (2005) discuss such factors extensively.

² The universities are MIT, Harvard, University of California-Berkeley, Stanford, University of Michigan, and Duke University. I do not know if these characterizations apply to universities in Europe and Japan, though I strongly suspect so, at least in economics and business.

entry dynamics, and network economies, in which IP would presumably be an important form of encouragement or discouragement. Only two course descriptions, one at Harvard and one at Berkeley, mentioned IP. No courses in economic development or international economics mentioned IP or areas in which it would naturally arise.

As might be expected, however, MBA programs at these universities offer specific courses in managing technology and innovation, often with a strong emphasis on IP management. For example, Duke University's Fuqua School offers a course in "Intellectual Capital and Competitive Strategy" that focuses heavily on valuing and managing IP assets. Harvard's Business School offers two courses in managing technology, including one called "Commercializing Science and High Technology", in which most of the students are from science, engineering, and medicine. MIT's Sloan School has several courses on technology strategy and an entire sub-discipline on managing innovation and entrepreneurship. It appears that IP issues are prominent in those course curricula.

For their part, engineering schools at these universities pay some attention to the social and developmental aspects of new technologies and applied engineering. Thus, for example, Stanford's School of Engineering offers a concentration for both undergraduates and masters of science graduate students in "technology and policy". While heavily focused on technical engineering, these programs are complemented with courses in microeconomics, public policy, ethics, and law. From the course descriptions there appeared to be few, if any, mentions of IP and certainly IP is not the focus of such courses. The engineering schools at the other universities follow a broadly similar approach. In sum, engineering departments (and, by extension, science departments) tend to rely on other academic programs to provide training in IP, or even refer their scholars and graduate students to university licensing offices.

As mentioned above, the situation is different for law schools. Duke University seems to be the most specialized in this regard among the university law schools visited. Duke's School of Law offers a course in basic intellectual property, courses in copyrights and patents, and a number of advanced seminars built around IP issues. The University of California at Berkeley also shares a strong specialization of this kind. The University of Michigan is perhaps representative of most top law schools in offering separate elective courses in copyrights, patents, and trademarks but does not offer much specialization beyond these. It is difficult to tell from websites how much these law schools attempt to integrate their IP offerings with economics and business strategy, perhaps through co-teaching approaches or visiting lectures.

3. How Do Economists Teach IP?

Within economics, IP comes up most frequently in microeconomic theory and industrial organization (theory of the firm), where interest arises in optimal policies regarding innovation and information diffusion. Studying IP also is relevant in public economics, for technology protection can serve as an indirect means of policy-based provision of new information, essentially a public good. Finally, it is coming up more

frequently now in international trade and development economics, as a number of scholars have paid attention to both optimal international provision and the effects of variations in IP protection on trade, investment, and technology flows. In this regard, IP has become a "mainstream" element of graduate economics, though it has not commanded its own dedicated courses.

This statement, it should be noted, applies almost strictly to patents as a matter of IP protection. Even within industrial organization there is little formal attention paid to issues of optimal trademark protection, despite its obvious importance as the fundamental answer to so-called "lemons" problems and other information externalities. Somewhat more attention is paid to copyrights in "new" industrial organization theory, focusing on network economies and information technologies. Like patents in their realm, copyrights tend to be modeled as a single parameter involving full monopoly rights, rather than a malleable piece of protection subject to such limitations as fair use and decompilation. Indeed, these kinds of limitations (including research exemptions in patents and exhaustion principles) have attracted almost no attention in the formal economics literature.

For their part, other forms of IP, such as geographical indications, plant variety rights, chip topography rights, confidential test data, and trade secrets, have commanded only verbal and descriptive analysis within economics. Moreover, genetic resources and traditional knowledge, while the subject of much legal analysis, have escaped economic modeling, perhaps because of the difficulty of conceptualizing collectively owned rights in a market context. These shortcomings need to be addressed and could be the foundation for a large research agenda.³

With this background, how is IP taught in economics departments? It is first encountered as a potential solution to a number of information externalities and market failures. As has often been pointed out, because they are non-rival and fully or partly non-excludable, new ideas and products sometimes may be easily copied or appropriated by second comers, reducing incentives for original developers to invest in sufficient research and development (R&D). Consequently, societies tend to suffer from insufficient investments in new technologies, information, and products without some form of policy intervention. IPRs (again, typically patents) are introduced as a second-best approach to resolving this appropriability problem. They are second-best because, in principle, direct R&D subsidies or investments by the government, combined with marginal-cost distribution, would be the optimal approach. However, for several reasons governments tend to perform poorly in the role of applied science and technology developers. The essential advantage of IPRs is that they are market-based interventions that support *ex-ante* incentives for investment through *ex-post* exclusive rights. However, such rights are limited in duration or scope for social and economic policy reasons.

³ An interesting example of applying economic models to newer forms of IP may be found in Reichman and Lewis (2005), who consider the economic incentives inherent in liability regimes with relatively open licensing.

There are a number of market failures in technology and information markets and it is remarkable that economists tend to focus heavily on just one: the basic appropriability problem in dynamic investments. It is worth listing a few other difficulties that IP may help resolve. First, if consumers are unclear about the origin of products and cannot determine quality based on appearance, second comers are likely to produce counterfeit or lower-quality versions of new goods and sell them under false claims about origins. This "lemons" problem is endemic in lower-income economies and, again, trademarks and related devices are the market-based solution.

Second, information is not only difficult to develop in an environment of extensive misappropriation, it is also difficult to trade between firms or across borders. Indeed, so-called "internalization" problems associated with the inability of firms to signal the true value of their technologies to, say, foreign partners without worrying about losing those secrets is a central reason for limited flows of international technology transfer and the tendency to keep such flows within the boundaries of multinational firms through foreign direct investment. However, appropriate patent regimes and trade secrecy laws can do much to resolve these difficulties and this factor may be the most significant from the standpoint of international technology transfer and IP.⁴ Put briefly, more analytical attention and instructional emphasis should be placed on the market-expansion effects (or, in the other direction, market-monopolization impacts) of IP protection.

Third, IP may play a crucial role in supporting the development of efficient contracts that share rents across participants in such complex, multi-agent creative enterprises as films, books, recorded music, networks, and software. For their part, economists tend to pay little attention to this aspect of copyrights in favor of analyzing the potential for long-lasting copyrights to limit socially desirable uses of new information. The latter emphasis is important, to be sure, to the extent that strong copyrights apply to cultural and, especially, educational and scientific materials. Again, there is a need for looking more closely at the optimal nature of copyrights in network economies and to think deeply about the implications of various limitations for fair use and other purposes.

Finally, patents play a role in diffusing information to new users and across borders. In fact, this role is heavily studied by technology specialists, who look at, for example, international citations of patented materials to see how rapidly and how far such information moves across space and time.⁵

In this general context, models of IP protection come up most readily in courses in industrial organization, innovation, and the economics of science and technology, along with management in business schools. Economists and business students studying other disciplines, such as international economics, public economics, development economics, and labor economics, are unlikely to be exposed to IP except in a cursory way. Moreover, this lack of attention is unlikely to change anytime soon because

⁴ See Arora, et al (2001) and Yang and Maskus (2001).

⁵ Jaffe and Trajtenberg (2002) is now a standard reference.

students who are currently being trained in graduate economics in such areas rarely write about IP.⁶

In my view, perhaps the ultimate shortcoming of economics training and scholarship in IP is that models, almost of necessity, use broad and naïve characterizations of what IP is and how it works. As I have already mentioned, economic analysis has focused heavily on patent length or scope, as a single parameter, without considering very much the economics of utility, novelty, exhaustion, research exemptions, and the like. A similar statement applies with more force to copyrights, while trademarks and trade secrecy attract little attention. There is, accordingly, a need for considerably more sophistication in the approach to IP, both for research and training.

In this regard, the greatest need is for extensive integration of the economics of IP with law, technology, and business (rights management and capital markets). Examples of where such integration could be beneficial are legion. For example, traditional knowledge may benefit from some forms, perhaps new, of IP protection but economists have not seriously considered the legal literature on the subject. Virtually no analysis has been done of geographical indications as incentives for product development in poor countries, though linking basic models of product origin and consumer uncertainty with business rights management could do much to push that agenda forward. Thus, institutions that establish strong interdisciplinary programs in the analysis of IP will be the intellectual leaders in this area for some time to come.

4. Is There a Demand for Integrated Approaches?

Economists are notoriously territorial when it comes to working with other disciplines, tending to find detailed and meticulous scholarship (law) or case studies (business) to be, at best, special cases of general processes. However, graduate students and even undergraduate students have significantly increasing interests in understanding the processes of innovation and technology trade in the globalizing information economy. It is hard to see how students can generate a comprehensive understanding of these difficult and complex processes without an interdisciplinary approach.

Thus, in my view the next step in the evolution of IP education, which has been haphazard and *ad hoc* outside of law schools, is for serious interdisciplinary integration. This is always easier said than done but some early examples are promising, such as the program at Duke University involving the law school and members of the public policy school. The University of California at Berkeley also has a lengthy history of combining economics, management, and law when it seemed sensible to do so. Following their leads and finding new models for research and instruction would seem to be an appropriate task for the medium term.

⁶ I cannot resist mentioning that one significant exception is the set of students writing in international trade at the University of Colorado, where several recent dissertations on the theory and empirics of IP in the international economy have been completed. Some important recent papers written elsewhere, such as Grossman and Lai (2004) may change the stage a bit in international economics as well.

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