

## FTC/DOJ Hearings on the Implications of Competition and Patent Law and Policy

ABA Antitrust Section Summary of  
Welcome and Overview Session

February 6, 2002

On February 6, 2002, the Federal Trade Commission and Department of Justice commenced their hearings on the implications of antitrust and patent law on competition and innovation. The first day of hearings introduced the public to the broad structure and purpose of the hearings, then focused on some of the more general issues involving the intersection of intellectual property and antitrust policy. The speakers included:

- **The Hon. Timothy Muris**, Chairman of the Federal Trade Commission.
- **The Hon. Charles A. James**, Assistant Attorney General for Antitrust, Department of Justice.
- **The Hon. James Rogan**, Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office.
- **The Hon. Robert Pitofsky**, Georgetown University Law Center, former Chairman of the Federal Trade Commission.
- **The Hon. Pauline Newman**, U.S. Court of Appeals for the Federal Circuit.
- **The Hon. Q. Todd Dickinson**, Howrey, Simon, Arnold & White, and former Under Secretary of Commerce for Intellectual Property and Director of the U.S. Patent and Trademark Office.
- **The Hon. Gerald J. Mossinghoff**, Oblon, Spivak, McClelland, Maier & Neustadt, former Assistant Secretary of Commerce and Commissioner of Patents and Trademarks.
- **Dr. Richard Gilbert**, Professor of Economics, University of California, Berkeley, and former Deputy Assistant Attorney General for Antitrust, Department of Justice.
- **Dr. Richard Levin**, President of Yale University.

Below are summaries of remarks from each of these speakers.<sup>1</sup>

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<sup>1</sup> All speakers currently in government noted that their remarks represented their own views, and not necessarily the views of the institution they represent or of other members of those institutions.

## **The Honorable Timothy Muris**

Chairman Muris began his remarks with an overview of why these hearings were timely and appropriate.<sup>2</sup> Emphasizing that innovation is crucial to the United States economy, and that intellectual property is a "bulwark" of innovation, Chairman Muris said that the hearings could be useful in enhancing our collective understanding of how innovation and competition interact. He pointed to the FTC's historic purpose and role as a government agency that has brought scholars, business leaders, policymakers, and practitioners together to identify and understand new economic trends with important policy dimensions. He also emphasized that the primary purpose of these hearings would -- at least for antitrust enforcers -- be educational. There is, according to Chairman Muris, no "hidden agenda."

Chairman Muris then turned to the broader issues that would be addressed in the hearings. He noted at the outset broad consensus that the purpose of patents and copyright is to encourage innovation, and that innovation benefits consumers. The purpose of antitrust is to combat restraints on "vigorous competition." Although some "sensitivities" at the intersection of antitrust and intellectual property would be inevitable, Chairman Muris said that the hearings could, by highlighting contrasting points of view, enhance public policy. Central to the development of sound policy would be more detailed empirical assessments of the net effects of intellectual property rights on innovation and social welfare. According to Chairman Muris, empirical work on intellectual property has been fairly limited, focusing primarily on inter-industry differences. Chairman Muris also noted that the National Academies' Board on Science, Technology and Economic Policy, with a group under the direction of Yale University President Richard Levin, was in the process of conducting a lengthy study on the operation and impact of the patent system.<sup>3</sup>

Chairman Muris then discussed the general structure of hearings over the next few months. First, there would be "basics" sessions that would introduce antitrust lawyers to intellectual property law and intellectual property lawyers to antitrust law. The hearings would then focus on the role of competition and intellectual property in spurring innovation. Future sessions would examine the role of patents in standard-setting, specific antitrust "rules for the road," and international intellectual property and competition issues.

## **The Honorable Charles A. James**

Mr. James began his remarks by applauding former Chairman Pitofsky's revival of hearings as a useful instrument in the formulation of antitrust policy. He also thanked Chairman Muris for inviting the Antitrust Division to participate in hearings as full partners.

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<sup>2</sup> He also referred the audience to his remarks at the ABA Antitrust Section's Fall Forum, at which he announced the hearings and discussed some of the more specific antitrust issues involving intellectual property. His speech may be found at [www.ftc.gov/speeches/muris/intellectual.htm](http://www.ftc.gov/speeches/muris/intellectual.htm).

<sup>3</sup> More information about the National Academies study, including papers and transcripts from its proceedings, may be found at [ip.nationalacademies.org](http://ip.nationalacademies.org).

Mr. James then focused on some of the broader issues that would be addressed in the hearings, noting that most and perhaps all could agree on the significance of the issues even if people continued to disagree on specific policies. Mr. James echoed Chairman Muris' remarks that antitrust and intellectual property share the common purpose of enhancing consumer welfare. Antitrust law seeks this objective by eliminating artificial restraints on the competitive process; intellectual property rights furthers this objective by "celebrating innovation."

Like Chairman Muris, Mr. James emphasized the largely educational function of the hearings. Mr. James expects the hearings to reveal additional insights on how antitrust and intellectual property can continue to peacefully coexist while seeking the same objectives. He specifically noted that the antitrust enforcement agencies would not necessarily use the hearings to revise the 1995 DOJ/FTC Antitrust Guidelines for the Licensing of Intellectual Property ("IP Guidelines"), emphasizing that any reformulations of the guidelines would occur through a transparent process.

Mr. James then examined the more specific antitrust issues that he expects to be addressed through the hearings, naming four general categories:

- *Licensing by a single firm.* Among the issues Mr. James mentioned were package licensing, grantbacks, payments not to compete, and restrictions that may extend the scope or duration of intellectual property rights. Mr. James specifically noted that panels would focus on whether bundling promotes or impedes the dissemination of intellectual property, and whether the procompetitive benefits of grantbacks outweigh the potential reduction in a licensee's incentive to generate follow-on innovations.
- *Licensing by multiple firms:* Among the issues Mr. James mentioned were the nature and impact of collective rights organizations (such as the patent pools formed for MPEG<sup>4</sup> and DVD<sup>5</sup> technologies); the role of standard-setting organizations in creating and applying standards that may incorporate intellectual property; and determining the scope and validity of patents, which, according to Mr. James, is a significant factor in both conduct and merger investigations in resolving whether transactions are vertical or horizontal, and also whether firms would be potential competitors in the absence of a license or acquisition.
- *Refusals to license.* Mr. James said the hearings would examine in more detail the implications of the Federal Circuit's decision in *In re Independent Service Organizations Antitrust Litigation*,<sup>6</sup> and how the decision may apply to conditions in licensing agreements, including tying restrictions.

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<sup>4</sup> For DOJ's favorable business review letter involving this patent pool, *see* [www.usdoj.gov/atr/public/busrev/1170.htm](http://www.usdoj.gov/atr/public/busrev/1170.htm).

<sup>5</sup> For DOJ's favorable business review letters involving these patent pools, *see* [www.usdoj.gov/atr/public/busrev/2121.htm](http://www.usdoj.gov/atr/public/busrev/2121.htm) and [www.usdoj.gov/atr/public/busrev/2485.htm](http://www.usdoj.gov/atr/public/busrev/2485.htm).

<sup>6</sup> 203 F.3d 1322 (Fed. Cir. 2000) (holding that patentholders enjoy antitrust immunity for unilateral refusals to license except in cases involving fraud on the Patent & Trademark Office, sham litigation and tying).

- *International licensing issues.* Mr. James mentioned the potential trade impediments that could be created by divergent intellectual property rights and competition laws throughout the world. He also noted that the European Union recently issued a Green Paper in December 2001 which is likely to lead to revisions in and expansions of the EU's Technology Transfer Block Exemption ("TTBE").<sup>7</sup>

Acknowledging that the hearings had a fairly ambitious schedule, Mr. James said that balanced and high-quality panels would help the hearings fulfill their educational objectives.

### **The Honorable James Rogan**<sup>8</sup>

Mr. Rogan, the current Director of the Patent & Trademark Office ("PTO"), opened his remarks by applauding the FTC and DOJ for holding hearings that would examine the positive impact of intellectual property rights on innovation and national economic growth. He cautioned that any return to more burdensome antitrust limitations on intellectual property allegedly directed at short-term economic objectives might have adverse long-term consequences on innovation. Pointing to Article I, Section 8 of the Constitution, Mr. Rogan stated that the Founding Fathers had understood the benefits of conferring exclusive rights on authors and inventors for limited periods of time. Over two centuries later, according to Mr. Rogan, industries and companies based on intellectual property are at the very center of the United States economy.

Mr. Rogan then discussed the impact of intellectual property on competition. First, he noted that patents and copyrights may confer exclusive rights, but they do not confer monopolies. According to Mr. Rogan, the limited duration of the exclusive right also limits the economic power gained from the exclusive right, and gives intellectual property owners a significant incentive "not to rest on their laurels." Mr. Rogan also pointed out that patents do more than confer incentives to innovate. They also require patentholders to disclose the nature and significance of patentable inventions. This not only advances technological progress, but gives rivals of the patentholder greater insight into where to direct their research and development efforts. Mr. Rogan expressed his belief that the *quid pro quo* of the patent system - - exclusive rights in exchange for public disclosure -- has been systematically ignored by critics of exclusive rights. Mr. Rogan also asserted that the potential grant of exclusive rights to others also encourage some firms to publish their results sooner rather than later (because prior art in the public domain can undermine subsequent patent applications).

Mr. Rogan then examined some of the more conventional criticisms of the current patent system. First, he stated that the rigorous standards for patentability -- that, among other things, an invention be new, useful and nonobvious -- ensured that patents would be awarded only in circumstances where the public is likely to benefit. Mr. Rogan also said that broad, "pioneer" patents that are central to some markets and industries are neither new nor unsettling. He also

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<sup>7</sup> The Green Paper may be found at [europa.eu.int/comm/competition/antitrust/technology\\_transfer/en.pdf](http://europa.eu.int/comm/competition/antitrust/technology_transfer/en.pdf).

<sup>8</sup> Mr. Rogan's written submission may be found at [www.ftc.gov/opp/intellect/rogan.htm](http://www.ftc.gov/opp/intellect/rogan.htm).

pointed out that the increase in patents has not prevented the growth of new industries (such as software) despite those who had contended that it would destroy competition in new industries.

Mr. Rogan also discussed the interplay of antitrust policy and intellectual property rights. Mr. Rogan asserted that competition law cannot trump intellectual property rights, whose foundations are in Article I, Section 8 of the Constitution. He specifically cited the 1970s as an era of unjustifiable and counterproductive antitrust hostility towards intellectual property rights. Mr. Rogan then pointed to antitrust guidelines for licensing promulgated in the 1980s as sensible and modern antitrust enforcement policy which encouraged numerous inventors -- including many start-up firms and universities -- to patent inventions and license them to other firms. According to Mr. Rogan, the removal of artificial antitrust impediments encouraged firms to innovate and patent their inventions.

Another important factor cited by Mr. Rogan in the increase in patents was the creation of the Federal Circuit, an "invaluable tool" for reducing jurisdictional conflicts, forum-shopping, and unjustifiable divergences in patent law. The increase in the predictability of patent law resulting from the creation of the Federal Circuit gave investors and inventors a more assured basis for investing and litigating. Mr. Rogan also asserted that expanding the subject matter of patentability was another factor in increasing patents and investment in the United States, which has allegedly made many U.S. companies leaders in new areas. Finally, Mr. Rogan reminded the audience that intellectual property rights have become a central aspect of trade policy through the WTO and WIPO; the U.S. government is now seeking to enhance the value of U.S. patents by securing parallel rights in foreign jurisdictions.

In short, Mr. Rogan believed that the "explosion of patents" has reflected and enhanced innovation and strength of the American economy. He concluded by committing the PTO to a full discussion of issues raised during and by the hearings.

### **The Honorable Robert Pitofsky**

Professor Pitofsky opened his remarks by congratulating the agencies on holding hearings on such an important and timely topic. Like Chairman Muris and Mr. James, Professor Pitofsky contended that hearings can have a significant role in formulating antitrust policy, sometimes more often than specific, high-profile cases. Hearings are consistent with the FTC's traditional mission, which, according to Professor Pitofsky, is not just to enforce the law, but also to examine whether "current law and procedures deserve to be current," and whether new economic developments merit adjustments in law and procedure.

Professor Pitofsky then examined some of the broader issues at the intersection of antitrust policy and intellectual property. First, he noted that the economy is extraordinarily dynamic, that innovation has been the primary driver of economic growth, and that products and services are increasingly the embodiment of ideas. Those ideas are often protected by intellectual property rights, which increase incentives to create those ideas and contribute to consumer welfare. In that sense, intellectual property rights can serve the same objectives as antitrust policy.

But Professor Pitofsky also noted that policies underlying antitrust law and intellectual property rights have clashed in the past. Antitrust law had traditionally restricted the ability of patentholders to condition their licensing. It had long assumed that patents conferred economic monopolies. Antitrust law also assumed that numerous licensing practices could be condemned without any examination of their context, purpose or economic impact -- the Nine No-Nos<sup>9</sup> of the 1970s being the apex of antitrust hostility to the exercise of intellectual property rights. According to Professor Pitofsky, antitrust law and antitrust enforcers today recognize that patents and copyrights do not necessarily confer monopoly power, and that licensing restrictions are often procompetitive when they encourage broader dissemination of intellectual property.

Citing the Federal Circuit's decision in *In re Independent Service Organizations Antitrust Litigation*, however, Professor Pitofsky warned that the antitrust/intellectual property pendulum may be swinging too far in the opposite direction. Professor Pitofsky contended that the primary flaw in the Federal Circuit's decision was going from the unquestioned premise that patentholders are under no general antitrust obligation to license their inventions to the more questionable conclusion that patentholders may be able to condition the license or sale of patented technology on a number of restrictions. Such precedent may, according to Professor Pitofsky, increase the ability of dominant firms to leverage power in one market to gain power in another without competing on the merits in the adjacent market. Professor Pitofsky also noted that the unprecedented number and scope of patents issued by the PTO may exacerbate concerns among some in the antitrust community about the broader implications of the Federal Circuit's recent holding. [Professor Pitofsky noted parenthetically that he did not believe that the increased in patents resulted from our economy becoming more innovative. But he added that the hearings may produce more information on why so many patents have issued in recent years.]

Professor Pitofsky then explained some of the reasons why antitrust policy needed to adjust to incorporate factors uniquely associated with intellectual property rights. First, Professor Pitofsky noted that market power is often less durable in many of the high-technology industries in which intellectual property is significant. He also observed that intellectual property is much easier to appropriate than other forms of property, which might legitimize concerns of patent and copyright owners about the misuse of their property by free-riding rivals. Third, Professor Pitofsky added that high-technology firms had less of a tendency to raise prices or reduce output, and more of a legitimate need for standard-setting. Citing the work of Professor Rich Gilbert, Intel Chairman Andy Grove, and Harvard President Larry Summers, Professor Pitofsky said that it would be unwise not to adjust antitrust policy to account for these factors in cases involving intellectual property.

Professor Pitofsky also cautioned that it would be imprudent to go to the opposite extreme -- that antitrust law should have no role in industries where, in the words of Bill Gates, nobody owns the key to the factory of ideas. Citing the pharmaceutical and computer industries, Professor Pitofsky noted that market power does not necessarily dissipate in high-technology

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<sup>9</sup> The Nine No-Nos were a list of commercial practices by patentholders which, according to the Antitrust Division, would be illegal without any detailed examination of their purpose or effect. Many of these were fairly routine conditions found in licensing agreements involving licensors with little if any market power.

industries, not only because intellectual property rights can be quite broad, but also because of other economic factors like network effects. Although Professor Pitofsky thought it unlikely that we would see a dominant firm in high-technology industries comparable to early 20<sup>th</sup> century Alcoa, he does believe that market power may nevertheless be both significant and durable in some segments.

According to Professor Pitofsky, the key question is how will antitrust law adjust to intellectual property rights, and the key objective should be moderation.

### **The Honorable Pauline Newman**

Judge Newman began her remarks with an overview of the role of the patent system in increasing innovation and economic growth. According to Judge Newman, the knowledge-based economy of the United States is based on science and executed through technology. Entrepreneurial risk-taking is important in ensuring that science and technology produce innovation and growth, and has become an ethos that has penetrated even the most mature industries, such as chemicals and material sciences.

The level of research, development and risk-taking is, according to Judge Newman, affected by the nature, degree and scope of exclusive rights conferred by intellectual property laws. She reminded the audience of the steady economic decline of the United States in the 1960s and 1970s, where innovation reached a nadir. In 1978, President Carter established a committee to examine the state of industrial innovation. One of the key findings of the committee -- in which Judge Newman participated -- was that the U.S. patent system desperately required more stability and predictability. The work of President Carter's committee eventually led to the creation of Judge Newman's court, the Federal Circuit. Judge Newman noted that only approximately 25% of the court's caseload relates to patents. The remainder consists of cases involving, among other things, government contracts, takings, international trade, trademarks, Native American claims, and Veterans Administration claims.

Judge Newman then turned to the interaction between antitrust and patent policy. According to Judge Newman, their policy objectives are divergent. Patents reward creative knowledge and risk-taking, but when products become successful (as especially revolutionary products often become), antitrust law becomes more concerned about the patentholder's commercial behavior. Judge Newman contended that antitrust law failed to recognize that other public benefits resulting from patentable inventions, especially the disclosure of important scientific and technological advances to the public.<sup>10</sup> Judge Newman also said that some of the most fundamental inventions of the Industrial Revolution -- the telephone, airplane, and cotton gin -- all involved major patents.

Judge Newman then returned to a discussion of the U.S. economy in the 1970s to provide a broader context for subsequent changes in the patent system and antitrust policy. In examining

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<sup>10</sup> Judge Newman cited her own experience as a patent lawyer required to produce a technological history of synthetic materials; all of the technical information relevant to progress in that field could be found in patents in that industry. No recourse to academic or trade journals was necessary.

industrial innovation, President Carter's committee discovered that productivity levels across U.S. industry were no longer competitive; only a few nascent technology-based industries were making positive contributions. The committee also believed that restrictive antitrust policy (including the Nine No-Nos) and judicial hostility to patents were among the factors reducing the competitiveness of U.S. industries.

According to Judge Newman, antitrust and patent policy began to change for the better in the early 1980s. In 1981, Roger Andewelt announced DOJ's abandonment of the Nine Non-Nos and the economic rationale for the policy shift, which included, among other things, evidence that high-technology firms increased prices only one-sixth as much as other firms and industries. Judge Newman also pointed to the creation of the Federal Circuit as another major factor in triggering the subsequent growth of innovation and the U.S. economy. Citing *Diamond v. Chakrabarty*,<sup>11</sup> Judge Newman added that the Supreme Court had also contributed to increasing innovation (especially in the biotechnology industry) by expanding the scope of patentable subject matter. These, according to Judge Newman, were only several among dozens of other factors that explain the increases in innovation that have occurred over the past 20 years. Although Judge Newman welcomed the hearings as a more detailed examination of factors contributing to innovation, Judge Newman cautioned that competition and antitrust policy were only a small part of a much bigger and very delicate system.

Judge Newman added some closing thoughts on additional questions and issues that hearings and academic studies could address. Among them:

- *How easy or difficult should it be to obtain a patent?* Judge Newman hinted that heightening the requirement of nonobviousness for patentability creates a significant amount of uncertainty (reflected in litigation).
- *How easy or hard should it be for "imitators" to avoid an "innovator's" patents while using ideas embodied in patents?* This essentially addresses the issues that arose in the Federal Circuit's *en banc* decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*,<sup>12</sup> in which the majority narrowed the doctrine of equivalents. The Supreme Court has agreed to hear the appeal. Judge Newman suggested that the majority's holding in *Festo* may increase the costs of seeking and enforcing patents for many firms at a time when scarce resources are needed elsewhere for achieving commercial success. Increasing the expense and difficulty of securing and enforcing inventions would, according to Judge Newman, reduce the incentive to innovate. Judge Newman added that the protection of property (intellectual or otherwise) is not only efficient (the Madisonian vision of property), but fair (a Jeffersonian vision rooted in natural rights theory).
- *Is it possible to improve upon the current balance struck in the patent system -- a grant of exclusive rights for a limited period of time?* Judge Newman does not

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<sup>11</sup> 447 U.S. 303 (1980) (holding that inventor could patent living organisms).

<sup>12</sup> 234 F.3d 558 (Fed. Cir. 2000).

think any other formulation would have comparable positive effects on the incentive to innovate.

Judge Newman concluded her remarks by underscoring the importance of understanding the nature of intellectual property and the function of patent rights in the formulation of sound antitrust and economic policy.

### **The Honorable Q. Todd Dickinson**

Mr. Dickinson began his remarks with an overview of the rationale for the current patent system. Because intellectual property rights are easily appropriated, a legal grant of exclusive rights is necessary to protect the incentive to innovate. According to Mr. Dickinson, the benefits of this system have been repeatedly proven over time and its foundation is, in any event, in the Constitution.

Like Mr. Rogan, Mr. Dickinson observed that patents and copyrights do not necessarily create economic monopolies -- firms that want to compete against intellectual property owners can frequently invent around patents and copyrights, and intellectual property owners are often not able to compete in other ways that are equally and perhaps more important in achieving commercial success. Moreover, patents themselves are vulnerable to attack in litigation -- they are not self-executing exclusionary rights. Prior art and doctrines such as the on-sale bar can undermine the enforceability of patents. And, according to Mr. Dickinson, even in those cases where firms obtain broad, enforceable, valid and economically significant "pioneer patents," there are only a small number and they are "well-deserved." Mr. Dickinson also said that antitrust concerns about patent thickets are premature and exaggerated. Although patent thickets and patent pools could confer market power, firms often remain able to invent around thickets, or enter broad cross-licensing agreements with other patentholders, like the DVD and MPEG patent pools mentioned by Mr. James.

Mr. Dickinson then evaluated recent academic assessments of the patent system. First, he referred to the history and dynamism of the software industry as strong empirical evidence that initial concerns about the impact and breadth of software patents were unwarranted. According to Mr. Dickinson, the dynamism of the industry itself reflected the grant of intellectual property rights to firms whose investors required evidence of solid assets before contributing capital to start-up entities. Second, Mr. Dickinson said that academic concerns about patent thickets and overbreadth were unwarranted and largely undocumented. Most evidence is anecdotal, and consistent with the notion of increasing research by more firms across a broader spectrum of technologies. Patent law reforms also made patents more accessible to a number of smaller firms. Mr. Dickinson believes that other empirical studies, such as the current study of the patent system by the National Academies, were necessary to determine the actual effectiveness of the current patent system.

Mr. Dickinson then addressed the debate over the increasing scope of patents. According to Mr. Dickinson, patents issued by the PTO reflect laws enacted by Congress and the increasing scope of patentable subject matter (as determined by courts). Like Judge Newman, Mr. Dickinson cited *Diamond v. Chakrabarty* as commencing a sea change in patent law and policy

that transformed the United States into a global leader in many new industries. Mr. Dickinson added that "patent layering" -- also a focus of academic critics of the patent system -- reflects little more than an expanding scope of patentable subject matter and increasing access to the patent system for start-up companies and academic institutions. He specifically cited the fundamental recombinant DNA patent shared by Stanford University and the University of California, San Francisco, as well as the University of Wisconsin Alumni Foundation patent relating to stem cell research.

Mr. Dickinson argued against the compulsory licensing of patents, citing a number of alternative approaches to achieving competitiveness and/or the broader dissemination of economically and socially important intellectual property. These alternatives included cross-licensing, patent pooling, and, in some cases, jawboning by other government agencies, such as the Department of Health & Human Services.<sup>13</sup>

Mr. Dickinson then examined the functioning of the PTO itself. According to Mr. Dickinson, Congress should give the PTO a more stable budget not based solely on fees generated from patent applications. Stable and greater funding would enable examiners to spend more time on evaluating patentability at a time when the Federal Circuit has been increasing the burden on PTO to demonstrate the validity of its initial decisions. Mr. Dickinson said these reforms would improve a system that is already functioning very well, notwithstanding "anecdotal" evidence from PTO critics pointing to a handful of suspicious patents out of the thousands issued each year. According to Mr. Dickinson, internal quality control assessments at the PTO (led by the top 15 examiners) reveal a remarkably consistent record of excellence.

Mr. Dickinson turned to the specific issue of business method patents. According to Mr. Dickinson, the PTO is doing nothing more than implementing judicial decisions recognizing the patentability of this subject matter. Mr. Dickinson also pointed out that the PTO itself implemented additional quality control procedures (including reviews by a second examiner) for patent applications claiming business methods. He added that the allowance rate for these applications had declined to 40%, and that business method patents are less than 0.5% of all patents issued by the PTO.

Mr. Dickinson also discussed whether the PTO is issuing too many patents. According to Mr. Dickinson, there are numerous, procompetitive reasons for the expanding number of patents, such as increased access to the patent system, increasing investment in innovations, foreign company filings, the creation of the Federal Circuit, the Bayh-Dole Act, and more certain funding mechanisms. Many of these patents are apparently not important enough for their owners to pay PTO maintenance fees. According to Mr. Dickinson, the question is not whether there are too many patents today, but perhaps whether there were too few in the past. Input from the private sector and other governmental agencies, coupled with continuing judicial review, has enabled the PTO to confront new and challenging issues in industries like software and biotechnology with a great deal of success.

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<sup>13</sup> Mr. Dickinson also referred to a White Paper issued by the PTO in December 2000 entitled "Patent Pools: A Solution to the Problem of Access in Biotechnology Patents?" The White Paper can be found at [www.uspto.gov/web/offices/pac/dapp/opla/patpoolcover.html](http://www.uspto.gov/web/offices/pac/dapp/opla/patpoolcover.html).

Mr. Dickinson concluded his remarks by noting a wariness in the intellectual property community about the content and direction of the hearings. Mr. Dickinson cautioned that small changes in structure and enforcement policy can produce significant changes in outcomes, both legal and commercial. He also reminded the audience that these issues are part of a much bigger picture that includes other government agencies and international systems.

### **The Honorable Gerald J. Mossinghoff<sup>14</sup>**

Mr. Mossinghoff opened his remarks by discussing the changes in the patent system in the 1980s. The creation of the Federal Circuit, new intellectual property legislation, and international trade negotiations elevated the importance of intellectual property in public policy and in the domestic economy. Mr. Mossinghoff noted that although these changes were initiated by the Reagan Administration, they enjoyed broad bipartisan support as a means of reviving innovation in the U.S. economy. Mr. Mossinghoff then said that he would devote the remainder of his time to three specific contemporary issues: (1) funding for the PTO; (2) the role of the Federal Circuit; and (3) whether the standard under patent law for nonobviousness should be changed.

Like Mr. Dickinson, Mr. Mossinghoff emphasized the importance of securing stable funding for the PTO not based solely on user fees that are diverted for other congressional appropriations. According to Mr. Mossinghoff, the PTO will face a funding crisis in the very near future that will adversely affect patent applicants. Today, each examiner handles approximately 100 patent applications at any given time; in five years, each examiner will handle 170. By 2007, it will take three years for an examiner to assess an application, and four years for the applicant to obtain its patent. A decline in the timeliness and quality of examination would, according to Mr. Mossinghoff, impose significant cost on innovators and the U.S. economy.

Mr. Mossinghoff then examined the record of the Federal Circuit, labeling it an "unqualified success." Quoting former Commerce Secretary Malcolm Baldrige, Mr. Mossinghoff said that businesses can fight against adversity, but cannot manage uncertainty. Before the creation of the Federal Circuit, patentholders, according to Mr. Mossinghoff, faced a generally hostile judiciary with often conflicting standards across circuits. This considerably increased the risk and uncertainty of enforcing patents, which in turn reduced the value of their invention and their incentive to innovate. Over the strong objections of the ABA, Congress nevertheless created the Federal Circuit, which has eliminated forum-shopping and enhanced the stability and predictability of patent law.

Finally, Mr. Mossinghoff addressed whether the standard for nonobviousness should be enhanced in order to reduce the number of patents granted. According to Mr. Mossinghoff, nonobviousness is the most difficult element to satisfy when seeking and enforcing patents. Before the addition of a new nonobvious standard to the patent law in 1952, courts were very hostile to patents when they were skeptical that the invention did not reflect a "flash of creative

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<sup>14</sup> Mr. Mossinghoff's written submission may be found at [www.ftc.gov/os/comments/intelpropertycomments/mossinghoffgeraldj.pdf](http://www.ftc.gov/os/comments/intelpropertycomments/mossinghoffgeraldj.pdf)

genius."<sup>15</sup> In *Graham v. John Deere Co.*,<sup>16</sup> the Supreme Court articulated a clearer test reflecting less on subjective notions of "creative genius" and more on objective indicia of differences between the claimed invention and prior art.<sup>17</sup> Lower courts were nevertheless wildly inconsistent in their application of the Supreme Court's standard. According to Mr. Mossinghoff, the creation and operation of the Federal Circuit eliminated these inconsistencies and has led to the creation of a broad and stable body of law upon which inventors and investors can rely in determining whether their inventions will be not only patentable, but enforceable.

Mr. Mossinghoff said that raising the bar for nonobviousness would result in significant long-term confusion and uncertainty; legislative proposals would undoubtedly confront significant industry and patent bar opposition. Pointing to data comparing R&D expenditures with the numbers of patents in the pharmaceutical industry, Mr. Mossinghoff said that the number of patents has not kept pace with the level of investment in innovation occurring throughout the economy, suggesting that no legislative changes are necessary or appropriate.

### **Dr. Richard Gilbert**<sup>18</sup>

Professor Gilbert focused his remarks first on the evolution of the 1995 IP Guidelines, of which he was a principal author and chief architect.

According to Professor Gilbert, the 1988 Guidelines for International Operations paved the conceptual path for the 1995 Guidelines by addressing licensing issues. The key principles of the 1995 Guidelines are that (1) intellectual property is comparable to other forms of property (though there are statutory limits and prerogatives that may affect antitrust analysis); (2) intellectual property does not necessarily confer market power; and (3) licensing often combines complementary factors of production and is generally procompetitive. The 1988 Guidelines also stated that "[t]he owner of intellectual property is entitled to enjoy whatever market power the property itself may confer," and that "[t]he Department will not require the owner of technology to create competition in its own technology." Professor Gilbert noted that although the 1995 Guidelines similarly stated that unilateral refusals to license do not generally raise antitrust issues, they did not go as far as the 1988 Guidelines in suggesting that intellectual property owners can enjoy whatever market power their property confers. According to Professor Gilbert, because market power itself may depend on conduct (including agreements) that may be anticompetitive, the agencies did not want to suggest that patent owners enjoyed antitrust immunity for all commercial conduct involving their patents. Instead, the 1995 Guidelines cautioned that "antitrust concerns may arise when a licensing arrangement harms competition

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<sup>15</sup> *Cuno Engineering Corp. v. Automatic Devices Corp.*, 314 U.S. 84, 91 (1941). Mr. Mossinghoff noted that judicial hostility to patents prompted Justice Robert Jackson to observe in one dissent that "the only patent that is valid is one which this Court has not been able to get its hands on." *Jungersen v. Ostby & Barton Co.*, 335 U.S. 560, 571 (1949) (dissenting opinion).

<sup>16</sup> 383 U.S. 1 (1966).

<sup>17</sup> Among the other factors mentioned by the Court were the level of ordinary skill in the pertinent art, commercial success, long felt but unsolved needs, failure of others to succeed where the inventor has allegedly succeeded. *Id.* at 17.

<sup>18</sup> Professor Gilbert's powerpoint presentation may be located at [www.ftc.gov/opp/intellect/guide1.ppt](http://www.ftc.gov/opp/intellect/guide1.ppt).

among entities that would have been actual or potential competitors in a relevant market in the absence of the license (entities in a 'horizontal' relationship)." Gilbert used basic graphs to demonstrate how patentholders could extract economic rents beyond the benefits of their patent by engaging in anticompetitive agreements with horizontal competitors.

Professor Gilbert turned to his key questions for an antitrust and intellectual property agenda. Among his questions:

- Should antitrust policy be more lenient for intellectual property?
- How to deal with combinations of allegedly blocking patents.
- Patent settlements.
- Cross-licensing and unilateral refusals to deal.
- Standard-setting.
- Winner-take-all markets (network effects).

Professor Gilbert then examined how recent antitrust policy has dealt with "patent aggregations." According to Professor Gilbert, the enforcement agencies have sent a "noisy message." In Business Review Letters addressing MPEG and DVD patent pools, the Antitrust Division said that it was acceptable to form broad patent pools aggregating allegedly essential patents.<sup>19</sup> But, according to Gilbert, the FTC sent conflicting messages in *VISX*,<sup>20</sup> where it dissolved a patent pool, and in the *Ciba-Geigy/Sandoz*,<sup>21</sup> where it required merging firms to license others when combining patents.

Professor Gilbert recommended a "rule of reason" approach to antitrust analysis of blocking patent combinations. The key elements of his analysis would be (1) the probability that all allegedly blocking patents would be found invalid or not infringed; (2) benefits from competition if patents were held to be invalid or not infringed; and (3) benefits from combining the patents. Multiplying the first and second elements would produce the amount of expected competition that would have occurred in the absence of the licensing agreement, and, if exceeding the third element, would render the agreement anticompetitive. Professor Gilbert then

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<sup>19</sup> DOJ's business review letters may be found at [www.usdoj.gov/atr/public/busrev/1170.htm](http://www.usdoj.gov/atr/public/busrev/1170.htm), [www.usdoj.gov/atr/public/busrev/2121.htm](http://www.usdoj.gov/atr/public/busrev/2121.htm), and [www.usdoj.gov/atr/public/busrev/2485.htm](http://www.usdoj.gov/atr/public/busrev/2485.htm).

<sup>20</sup> *In the Matter of Summit Technology, Inc. and VISX, Inc.*, FTC Dkt. 9286 (Aug. 21, 1998) (consent order alleging that Summit and VISX formed patent pool and fixed price of photorefractive machinery; FTC also alleged that Summit and VISX could have and would have competed against each other in the lease or sale of their equipment in the absence of the patent pool). For the FTC's Analysis to Aid Public Comment, *see* [www.ftc.gov/os/1998/9808/d09286ana.htm](http://www.ftc.gov/os/1998/9808/d09286ana.htm).

<sup>21</sup> *In re Ciba-Geigy, Inc.*, 123 F.T.C. 842 (1997) (alleging that merger would create killer patent portfolio that would eliminate licensing to other firms that would attempt to compete in several gene therapy markets; also alleged that each of the merging firms could have competed in relevant markets in absence of merger).

applied his model to more complex contexts where the parties allegedly possess multiple patents that would block the other party from competing in the relevant market, showing that a significant number of allegedly blocking patents would render their combination legal even if the probability of holding any individual patent invalid or un infringed were high.

Professor Gilbert nevertheless noted that recent academic studies had revealed that patents challenged in court were invalidated as often as 50% of the time, suggesting that the mere assertion of blocking patents should not immunize aggregations from antitrust scrutiny. Professor Gilbert also asserted that it would not be necessary for the enforcement agencies to conduct a full review of patent scope and validity to determine whether combinations create significant antitrust risks. The agencies could instead rely on a probabilistic approach that examined the array of possibilities (under Professor Gilbert's formula) given variations in the probability of invalidity or noninfringement.

Professor Gilbert reiterated that combinations involving multiple blocking patents were less likely to fail his equation and were more likely to result in greater efficiencies by reducing or eliminating royalty stacking and expediting new product or technology launches. But he added that the private incentive to challenge patents is often less than the expected social return of doing so. According to Professor Gilbert, successful challengers appropriate only a portion of the social benefits resulting from successful challenges, but must incur all of the litigation costs (and potential liability) if others do not join the challenge.

Professor Gilbert concluded his presentation by suggesting that antitrust agencies should challenge suspect patents especially "when spillover benefits and coordination problems are particularly large." That, according to Professor Gilbert, is more likely to occur when there are many users of the patented technologies at issue and multiple blocking patents. But Professor Gilbert also suggested that antitrust challenges should only be directed at contexts where "patents are particularly suspect and settlement-specific efficiencies are small."

### **Dr. Richard Levin**<sup>22</sup>

Yale University President Richard Levin opened his remarks by discussing his own academic work as an economist, which focused on how firms and industries appropriate returns from industrial research and development. In the 1980s, President Levin and several other academic colleagues conducted a survey of 650 executives representing 130 industries. The study revealed that the role and value of patents varied significantly across industries and firms. In some industries, it was more important to be first-to-market than to hold significant patents. But executives from the pharmaceutical and chemical industries responded very differently, concluding that patents were far and way the most effective way to appropriate returns on investment in innovation. A subsequent study by President Levin and other colleagues in the 1990s largely replicated the findings of the initial survey. President Levin is now heading a National Academies evaluation of the patent system.

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<sup>22</sup> President Levin's written submission may be found at [www.ftc.gov/os/comments/intelpropertycomments/levinrichardc.htm](http://www.ftc.gov/os/comments/intelpropertycomments/levinrichardc.htm)

President Levin then discussed specific industries in more detail. In chemical and pharmaceutical industries, patents often cover compounds and molecules that are individual products, making those patents both commercially significant and more easily enforceable. In other high-technology industries like computers, semiconductors and telecommunications, participation now requires bundles of patent rights. Although early development of the computer industry was based on three fundamental patents, subsequent developments in the industry led to multiple patents held by a number of different firms. This, in turn, led to broad cross-licensing agreements where firms "score" the most important patents in determining who may deserve to extract royalties. President Levin noted that pharmaceuticals and biotechnology are evolving in a similar direction, moving from "discrete" to "cumulative" inventions. According to President Levin, broad cross-licensing agreements should not raise significant antitrust issues and often enables firms to compete more effectively than in the absence of such arrangements.

President Levin then discussed the National Academies' evaluation of the patent system. He expects his committee to produce recommendations by September 2002. Recommendations will be based on conferences, public meetings, and papers submitted by participants in the study.<sup>23</sup> Although President Levin cautioned that he spoke only for himself and not the committee, he offered some personal observations about two particular areas: (1) the quality of patents issued by the PTO in emerging technologies, and (2) the role and impact of standard-setting organizations in high-technology industries, especially when standards are based on proprietary intellectual property.

With respect to the quality of patents in emerging technologies, President Levin questioned whether some computer and business method patents that could confer some measure of market power were true inventions. President Levin cautioned that the remedy for dubious patents would not be found in antitrust law, but in reforming a process that gives patents to mere rent-seekers. He noted that the PTO is already attempting to improve quality by expanding its databases and increasing the qualifications required for examiners. But President Levin also noted that courts could also have a positive impact through more rigorous application of the requirement of nonobviousness for patents. He expressed some concern that courts are substituting secondary factors -- such as commercial success -- for a more rigorous and appropriate examination of whether inventions are truly inventive. President Levin also suggested that a stronger and more open system of post-issuance review may reduce the need for later and more expensive litigation.

With respect to standard-setting, President Levin noted that computer, networking and telecommunications industries are using private standard-setting consortia that could raise antitrust issues. President Levin observed that although the 1995 IP Guidelines address cross-licensing and patent pooling, they may not give sufficient guidance on the more elaborate antitrust issues raised by standard-setting organizations.

President Levin also noted that other significant patent system issues include the increasing cost of patent litigation (reflecting perhaps too much emphasis on subjective factors in

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<sup>23</sup> Again, transcripts from the National Academies proceedings on the patent system, as well as academic papers, may be found at [ip.nationalacademies.org](http://ip.nationalacademies.org).

the case law), the patentability of natural discoveries (vs. human inventions), and the need for greater international convergence in intellectual property rules. According to President Levin, these are problems that are likely to be resolved only through legislative changes in the patent law.

Despite these concerns, President Levin expressed confidence that innovation is "alive and well" in the United States, and echoed cautions from Judge Newman and Mr. Dickinson that intellectual property and antitrust policy are small pieces of a much larger system.

## **FTC/DOJ Hearings on the Implications of Competition and Patent Law and Policy**

ABA Antitrust Section Summary of  
"Economic Perspectives on Intellectual  
Property, Competition and Innovation"

February 20, 2002

On February 20, 2002, the Federal Trade Commission and Department of Justice continued their hearings on the Implications of Competition and Patent Law and Policy. This session focused on economic perspectives on the relationships between intellectual property, competition and innovation. Speakers included:

- **Wesley M. Cohen**, Professor of Economics and Social Science, Carnegie-Mellon University.
- **Robert E. Evenson**, Professor of Economics, Yale University.
- **Shane M. Greenstein**, Professor of Management and Strategy, Kellogg School of Management, Northwestern University.
- **Edmund W. Kitch**, Professor of Law, University of Virginia School of Law.
- **James E. Langenfeld**, Director, LECG.
- **Joshua Lerner**, Professor of Investment Banking, Harvard Business School.
- **Philip B. Nelson**, Principal, Economists, Inc.
- **Janusz Ordover**, Professor of Economics, New York University.
- **Maureen A. O'Rourke**, Professor of Law, Boston University School of Law.

The session was split into morning and afternoon panels. Each is summarized below.

### **MORNING SESSION A**

#### **1. James A. Langenfeld, Ph.D**

Mr. Langenfeld made a presentation entitled "Innovation, Competition, and Intellectual Property: Providing an Economic Framework."<sup>24</sup> He discussed, as a theoretical matter, how to construct an

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<sup>24</sup> Dr. Langenfeld's presentation may be found at [www.ftc.gov/opp/intellect/langenfeld.pdf](http://www.ftc.gov/opp/intellect/langenfeld.pdf).

economic framework to determine the optimal level of intellectual property protection to maximize total economic welfare.

The assumed premise of his discussion was that increased innovation enhances total economic welfare. He began by describing several considerations that, in his view, should be included in the development of such a framework for evaluating the relationship between intellectual property and innovation and, more specifically, how intellectual property affects innovation. He suggested that the U.S. antitrust enforcement agencies have lately tended to treat intellectual property as if it is the same as tangible property. This approach, according to Mr. Langenfeld, neglects important economic differences between these two types of “property” and has skewed the agencies’ analysis of competitive effects in cases involving intellectual property rights.

Mr. Langenfeld suggested a variety of ways in which intellectual property, in his view, differs in an economically significant way from tangible property, including, among other things, the increased risk of misappropriation and free-riding that results from the intangible nature of intellectual property, and the increased risk of investment that accompanies research and development activities generally. These differences, according to Mr. Langenfeld, explain, at least in part, why intellectual property protection is necessary for intellectual property to exist at all. But, he cautioned, the degree of protection afforded intellectual property also involves important trade-offs. For example, while broader intellectual property protections could promote innovation by reducing free-riding concerns, on one hand, it might also discourage follow-on innovation if subsequent research and development could not be commercialized later because of extant intellectual property rights.

Mr. Langenfeld proceeded to suggest how the trade-offs of greater or lesser intellectual property protection could affect not only innovation, but also total economic welfare. He used a chart to illustrate how the promotion of the maximum number of inventions through the provision of greater intellectual property protection may not coincide with achieving maximum total welfare. For purposes of this illustration, he assumed that the total number of innovations directly related to the level of legal protection afforded intellectual property. While providing what he termed “complete protection of all claims” might produce the maximum number of “innovations,” he posited that the trade-offs of such an approach could well include increased potential for legal entanglements limiting the realization of follow-on innovation, as well as the elimination of opportunities for price competition. On net, he suggested, this environment may produce less total welfare than the maximum or, in other words, what might be produced in an environment that affords a less legal protection for innovations.

In conclusion, Mr. Langenfeld cited two real-world trends to show how these trade-offs are being affected today as a matter of public policy. First, he pointed to what he perceives as a tension between court decisions that seem to favor broader intellectual property protection — e.g., the Federal Circuit’s decisions in *Xerox* (203 F.3d 1322 (Fed. Cir. 2000), *cert. denied*, 531 U.S. 1143 (2001)) and *Intergraph* (195 F.3d 1346 (Fed. Cir. 1999)) — and those that tilt toward more antitrust enforcement — e.g., the Ninth Circuit’s remand decision in *Kodak* (125 F.3d 1195 (9th Cir. 1996), *cert. denied*, 523 U.S. 1094 (1998)) and the FTC’s Consent Agreements in the Intel matter). Mr. Langenfeld suggested that the tension between these cases is a salutary development, insofar as it reflects a recognition that intellectual property protection and antitrust enforcement must be “systematically balanced” to promote economic welfare. These cases, according to Mr. Langenfeld, also demonstrate that the courts and the antitrust enforcement agencies are working toward this balance. Second, he mentioned the reported growth in the number patents issuing from

the U.S. Patent and Trademark Office, including, in particular, business method patents. Mr. Langenfeld suggested that, as far as the economic trade-offs of greater intellectual property protection are concerned, the limits of the PTO review process must be taken into account in any policy efforts to achieve the appropriate balance between intellectual property protection, innovation, and economic welfare.

## **2. Robert E. Evenson, Ph.D**

Professor Evenson's presentation<sup>25</sup> introduced an international dimension to the morning's discussions. Professor Evenson is a faculty member of the Economics Growth Center, a research center sponsored by the Yale Department of Economics that, among other things, studies the economic development processes of lesser developed countries and how those processes are affected by economic relations with other countries. In his presentation, he described two papers that discuss the importance of intellectual property rights to international technology markets.

The first paper (co-authored with Sunil Kanwar of Yale and the University of Delhi) examines the relationship between intellectual property protection and the rate of technological change. Relying on various cross-country data, the paper finds that the evidence examined shows "unambiguously" that intellectual property protection has a strong positive effect on technological change. This relationship, according to the authors, is significant based on findings linking technological change and economic growth. The second paper concludes that a country's recognition of foreign intellectual property rights has a positive effect on domestic R&D productivity. This result, according to Professor Evenson, is due in significant part to the increased disclosure of foreign R&D that results when that work is accorded domestic intellectual property protection.

Professor Evenson next turned to explain what the implications of these findings may be for the economies of lesser developed countries. He observed first that since the 1960s economic convergence among developed countries has been strong, based in no small part on well functioning international technology markets in which developed countries have exchanged commercially inventions. As illustrated by the findings in his papers, intellectual property rights have contributed to this growth not only by fostering domestic R&D, but also by facilitating the disclosure of foreign research and development, which, in turn, further enhances domestic R&D productivity.

In stark contrast, Professor Evenson explained, lesser developed countries have not similarly benefited in the international technology markets. Professor Evenson observed that lesser developed countries have little native R&D capacity, and what domestic R&D capacity does exist typically is devoted to adapting existing innovations to overcome differences in production conditions from one geographic region to another, technology which has little marketability outside a discrete environment. As a result lesser developed countries have largely only participated in the international technology markets as buyers, and they have remained hostile to intellectual property rights, as they tend only to increase costs of foreign technology.

Professor Evenson concluded that these findings tend to show the shortcomings of conventional economic development policy, which has largely relied on lesser developed countries mimicking foreign

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<sup>25</sup> A summary of his presentation and papers may be found at [www.ftc.gov/opp/intellect/roberteevenson.htm](http://www.ftc.gov/opp/intellect/roberteevenson.htm).

technology as a means to promote convergence in technological development and economic growth, rather than attempting to promote directly the development of native R&D capacity. Thus, while the recognition of foreign intellectual property rights by developing countries might be expected to encourage the disclosure of foreign R&D, Professor Evenson suggested, lesser developed countries have little immediate incentive to compromise their short-term interests as buyers, nor could disclosure be expected to produce much economic growth in the absence of domestic R&D resources.

### **3. Wesley M. Cohen, Ph.D.**

Professor Cohen discussed his ongoing, empirical research to study the effectiveness and role of patents in fostering innovation.<sup>26</sup> According to Professor Cohen, there has been a broadening and strengthening of patent protection over the past twenty years, resulting from, among other things, changes in the law (e.g., the creation of the CAFC and court decisions expanding what is patentable subject matter) and “dramatic” growth in corporate patenting programs. In his view, the time is ripe for the question, whether or not, as a matter of public policy, these changes are a good or bad thing?

Specifically, Professor Cohen’s work examines the conventional rationale for the patent system; that is, that patents indeed promote innovation. It builds on what he terms a “forty year empirical legacy” that suggests “patents [are] not central to [the] protection [of innovation] in most U.S. industries.” In addition, Professor Cohen noted, more recent theoretical work indicates that the effects of stronger patents on research and development are ambiguous. Together these things, Professor Cohen suggested, “cast[] doubt on the presumed role of patents in stimulating innovation in most industries.”

As a basis for his effectiveness study, Professor Cohen has surveyed nearly 1,500 R&D lab managers in the U.S., broadly representative of firm size in distribution. In a parallel study, Professor Cohen has also surveyed nearly 650 Japanese R&D lab managers. As a means to attempt to measure the effectiveness of patents, Professor Cohen asked the respondents to identify the percentage of their respective “firms’ innovations for which [each of five specified] mechanism[s] was effective in protecting competitive advantage from that innovation.” The five mechanisms included secrecy, lead time, complementary sales and service, complementary manufacturing capabilities, and patents. The survey sampled methods of protection for product innovations and process innovations separately.

The results of his study show that, among the sample respondents, secrecy and lead time are the most important means of protecting competitive advantage for product innovations and that patents are the least effective overall. Professor Cohen provided what he believed are several important caveats to these results. First, none of the proposed mechanisms operates independently; thus, Professor Cohen concludes, his “effectiveness” measure reflects a particular mechanism’s “centrality” to a firm’s overall intellectual property protection strategy. Second, the results are averaged across all sampled industries, and there are significant outliers. The pharmaceutical industry was one example of an industry, cited by Professor Cohen, where patents are substantially more important relative to other mechanisms, while the communications and semiconductor industries are examples of those for which patents are relatively less important. Finally, Professor Cohen cautioned that these results should not be interpreted to suggest that patents do not stimulate R&D, even in industries where they are relatively less effective.

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<sup>26</sup> A copy of his presentation may be found at [www.ftc.gov/opp/intellect/cohen.pdf](http://www.ftc.gov/opp/intellect/cohen.pdf).

Professor Cohen's study also surveyed why firms do not pursue patents for particular innovations. The difficult of overcoming standards of patentability (specifically, novelty) was cited as the leading factor (32%), although it did not outpace by far two other reasons, namely, to avoid the requisite disclosure obligations (24%) and the ease of inventing around patented inventions (25%). In addition, Professor Cohen suggested that he found some evidence to support the conclusion that the costs of procuring and defending patents provides yet another reason why some firms — particularly smaller ones — may not patent their innovations.

Professor Cohen next examined how patents are used “to help understand how they may affect innovation and, possibly, competition.” For both products and processes, the survey results showed that patents, again on a non-exclusive basis, are used first and foremost to prevent copying — products (96%) and processes (78%). The next leading uses in descending order for products and processes, respectively, included patent blocking (82%/64%), preventing suits (59%/47%), and use in negotiations (48%/37%).

Based on these results, Professor Cohen has begun to examine how these uses vary across industries. Toward this end he has developed what he terms “discrete” and “complex” product industries. Discrete industries include those such as pharmaceuticals and medical devices where a product is often protected by relatively few patents. Complex industries, in contrast, include those such as computers and communications equipment, where a product is often protected by numerous (indeed, sometimes hundreds) of patents. Professor Cohen has posited, in general, that differences in the number of patents claiming a particular, “commercializable” innovation directly influences how firms will use their patent rights. Specifically, he has, in his words, “conjectured” that in discrete industries, the relative breadth of patent rights may permit their use as “fences” to block rivals’ use of economic substitutes. In complex industries, on the other hand, Professor Cohen speculated that the relatively narrow claims of the relevant patents combined with the sheer number of them would force firms to use their patents alternatively to block rival’s use of their essentially complementary innovations, but only as a means to assure “inclusion or ‘player’ status in cross-licensing negotiations.”

According to Professor Cohen, the survey results have “substantially confirmed” his conjecture. In complex product industries, for example, respondents answered that the leading uses of patents include negotiations (81%), blocking and negotiating (61%), and cross-licensing (55%), as compared with discrete product industries where these uses were cited by respondents as 33%, 29% and 10%, respectively. The leading use for discrete product industries, as expected although perhaps not as robust, was as a fence — to block but not to negotiate — at 45%.

Professor Cohen suggested that the relevant findings of his study that might create some concern for antitrust policymakers, included for complex product markets, (1) evidence of mutual dependence and associated player strategies that could encourage portfolio races and generate costly “arms races,” (2) some evidence of patent harvesting, where firms patent inventions that they would have produced in any case, which arguably suggests that patent may have little effect on R&D in these industries, and (3) the potential for barriers to new entry (and innovation) that portfolio races among existing firms may create. Professor Cohen did not claim to know if patent portfolios in complex industries, in fact, are deterring entry or innovation, but he stated that it is a legitimate concern that should be investigated. At the same time, he balanced these potential concerns with the possible benefits that may derive from extensive cross-licensing

among incumbents, including, for example, the promotion of information sharing and the avoidance of license stacking and the possible break-down of licensing negotiations due to the large number of claimants.

Taking another angle on ascertaining the “effectiveness” of patents, Professor Cohen also attempted to measure the significance of information flows on innovation by examining the other side of the patent bargain: disclosure requirements. In his view, disclosure is an often overlooked aspect of patent policy that could importantly affect innovation. Disclosure requirements, Professor Cohen explained, could produce savings through the avoidance of duplicative R&D and thereby improve R&D productivity and incentives. At the same time, Professor Cohen suggested, there is balance involved here too: disclosure can reduce the potential for appropriating innovations and thus potentially the incentive to innovate.

To accomplish this part of his analysis, Professor Cohen compared patenting and related information flow data collected from the same R&D labs in the U.S. and Japan. As part of the survey, Professor Cohen had asked the respondents, among other questions, (1) whether information from rivals’ patent disclosures suggests new R&D projects or contributes to the completion of existing projects, and (2) when rivals’ major R&D projects can be identified.

The survey results suggest that contribution of information flows to innovation are more substantial in Japan than in the U.S. Professor Cohen commented that these results may be attributable largely to procedural differences in the two countries’ patent systems. For instance, patents issue to the first person to file in Japan, whereas in the U.S. they issue to the first person to invent; hence, in Japan, there is presumably a greater incentive to disclose sooner. Similarly, in Japan, patent applications themselves are disclosed eighteen months after filing, whereas they are not disclosed in the U.S. until the application is granted. In addition, Professor Cohen noted, substantive differences in Japan’s patent laws tend to generate narrower patent claims and thus, in effect, more industries where the number of patents that relate to a single, commercial product are greater. In Professor Cohen’s parlance, there are more complex product industries. This insight, Professor Cohen noted incidentally, is also supported by survey responses from Japanese R&D lab managers on patent use, which, across all industry types in Japan, substantially resemble the responses from U.S. firms in complex product industries. Likewise responses from Japanese show that patents are the leading information source for R&D in Japan, while patents are in the middle of the pack in the U.S.

Professor Cohen suggested one interpretation of these data was that changes in patent policy may significantly increase R&D spillovers, while not necessarily diminishing R&D incentives. Professor Cohen found that R&D information flows across rivals had a positive effect on industry R&D. Similarly, he found that Japan’s R&D intensity is greater than that of the U.S. on average. The upshot, according to Cohen, is that any changes in U.S. patent policy at the very least should give equal consideration to appropriability and disclosure.

Finally, Professor Cohen discussed what he has found so far on the ultimate issue of whether or not patents, in fact, promote the “progress of science and the useful arts.” In particular, he addressed what he has found in those industries where patents reportedly are relatively unimportant in protecting R&D. On this question, he explained that his study targets four key variables: patent propensity (the percentage of innovations that firms patent), patent effectiveness, the reported number of patent applications, and R&D. It uses data on these variables to measure what Professor Cohen has termed the “patent premium,” the “proportional increment to the value of inventions realized by patenting.” The study then attempts to simulate the impact of the patent premium on R&D.

Professor Cohen explained that this design was intended account for a number of the things, including (1) the effect of both appropriability and disclosure, (2) the recognition that R&D and patenting are driven by many of the same variables and that one affects the other, and (3) that patent effectiveness is also driven by managerial capabilities (not just policy and technology) that may also affect R&D. The preliminary results of the study show that patenting positively affects R&D overall, even in complex industries, like semiconductors. The study also reveals some degree of harvesting in all industries, but particularly in those where the patent premium is lowest.

In conclusion, Professor Cohen summarized his work as follows: (1) there are many ways to protect inventions; (2) patents are not as features as others, but they do stimulate R&D broadly, although more in some industries than others; (3) patent disclosures contribute importantly to R&D information flows; (3) player strategies in complex industries may raise some policy concerns; and (4) litigation costs may bar smaller firms from taking advantage of the system's benefits.

#### **4. Discussion**

FTC staffer Bill Cohen opened the first discussion session of the morning by asking Mr. Langenfeld if the relationship between maximum total welfare and maximum innovation took into account the effects of market power that may be attributed to certain intellectual property. Mr. Langenfeld responded, first, by emphasizing that market power may not be attributed as a matter of course to intellectual property, but that certain "unique" (or "differentiated"), patented products may manifest market power. Professor Edmund W. Kitch, who spoke on the next panel, seconded this observation. According to Professor Kitch, thousands of patents have no commercial value, let alone confer market power. Moreover, he added, patent claims frequently are drawn narrowly and do not correspond to a commercial product, which, according to Professor Kitch, makes the discussion of patents in terms of products and product markets very difficult.

Professor Cohen also agreed that few patents actually confer market power except, he added, in the case of discrete inventions like some pharmaceuticals. Professor Cohen noted that economists have historically considered pharmaceuticals as the best example of this phenomenon, but that pharmaceuticals, in his view, are an "off the scale" exception. He then elaborated on Bill Cohen's question to suggest, in an attempt to synthesize his and Mr. Langenfeld's discussions, that any analysis should also take into account how patents are in fact used in particular industries, as well as their actual scope. Professor Cohen and Mr. Langenfeld agreed on this point, noting that broad portfolios of narrow patent rights could potentially create the same kinds of barriers to entry as a broad claim in a single patent.

Mr. Langenfeld then noted that his model attempts to describe the relationship between *total* welfare and innovation, rather than *consumer* welfare and innovation. The significance of this distinction in economic terms, he observed, is that total welfare does not account for the distribution of economic surpluses, whereas consumer welfare measures how much of any economic gains are passed on to consumers. Thus, as a theoretical matter, what produces maximum consumer welfare may not also produce maximum total welfare. Mr. Langenfeld suggested that the recognition of this distinction is important for the development of intellectual property policy. Because the U.S. antitrust enforcement agencies typically have used consumer welfare as the benchmark for setting competition policy, Mr. Langenfeld observed, it is important for them to recognize the potential shortcomings of this standard in this context. According to

Mr. Langenfeld, consumer welfare tends to be a short-run measure, and it may not adequately account for the long-run effects of patent rights on innovation. Focusing policy narrowly on the achievement of the greatest short-term consumer benefits, Mr. Langenfeld suggested, might jeopardize future investment in R&D, the benefits of which are supposed to redound ultimately to consumers, though only in the long run.

Professor Kitch then shifted the discussion toward the definitional issue of what are stronger and weaker intellectual property rights? He suggested that before any workable policy can be formulated for adjusting the “strength” or “weakness” of intellectual property rights, a benchmark must first be established. Professor Kitch cited commentators who have reported that recent decisions of the Federal Circuit, on one hand, have strengthened patent rights by paring back the non-obviousness requirement, but on the other hand, have weakened patent rights by limiting the application of the doctrine of equivalents. Without first a benchmark, he concluded, it is impossible to evaluate the effects of these more recent decisions.

Professor Cohen suggested, in response to Professor Kitch, that focusing on the particular dimensions of patent rights — e.g., scope and duration — could provide a basis for meaningful judgments about intellectual property policy without knowing exactly how strong patent rights are or what the precise economic effects of that strength may be. While conceding that the study of the strength and weakness of patent rights is a useful exercise, he noted that the specific dimensions of patent rights are what generate real-world economic expectations, and thus that policymakers, in his view, should focus on how those dimensions have changed and how those changes have affected behavior.

Bill Cohen next shifted the discussion toward Professor Cohen’s presentation, and asked whether or not negotiating strategies in particular industries might provide a means to adjust standards of patentability. Wesley Cohen responded negatively, stating that while this idea might have some a priori appeal, the standards of patentability should not change across industries, simply because there is not way to measure or implement such refinements.

Finally, FTC staffer Hillary Greene asked the panelists what kind of empirical data would be useful in examining these issues. Professor Cohen, again, responded. He observed that current data on R&D expenditures is very poor because it is aggregated. He suggested that, for example, disaggregated data on sales and margins for particular lines of business would be particularly helpful, and that some of the best data of this sort, in fact, had been collected by the FTC in the late-1970s. He also added, however, that while these data would be useful, the FTC should also bear in mind that any efforts to collect similar data should be considered carefully, because they would impose a substantial burden on industry and involve significant costs to analyze.

## **MORNING SESSION B**

### **1. Professor Edmund W. Kitch.**

Professor Kitch discussed the nature and functioning of the patent system, summarizing theories that he first articulated in a 1977 article.<sup>27</sup>

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<sup>27</sup> Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 *J.L. & Econ.* 265 (1977).

Professor Kitch began by noting the contributions of economists to his understanding of the patent system. The purpose of his work was to relate back superficially inconsistent features of the patent system with the alleged incentives they were designed to encourage. According to Professor Kitch, his primary insight was to reconceptualize the patent system in prospective terms — viewing patents literally as "prospects" — instead of thinking of the system as a mechanism solely for rewarding investment in research and development.

Professor Kitch pointed to several examples where it was difficult to conceptualize patents solely as a reward mechanism: (1) a claim with a few limitations will cover improvements claiming additional elements; (2) claims covering a compound will cover all uses of that compound, so that inventors of improvements will remain subject to the compound patent; (3) claims covering a process will subject follow-on inventors of improvements to the patent even if the improvements account for the commercial utility or success of the original invention; and (4) claims covering machines will cover a machine with new features.

According to Professor Kitch, the ability to obtain patents offering no commercial utility and to assert patents over improvers that claim significant advances is hard to reconcile with the traditional "reward" theory of patents. He also pointed to other features that are inconsistent with a "reward" model: (1) rules encouraging applications before inventions have been perfected; (2) the issuance of many patents long before the technology became commercially useful; and (3) the winner-take-all nature of obtaining patents, where other applicants who may invest more or file only a little later may receive no rights from the government.

These and other features of the patent system led Professor Kitch to draw analogies between mineral prospecting claims in the west and the patent system. As in the patent system, Professor Kitch said that mineral claimants (1) did not need to show the commercial significance of their claim; (2) could make claims before making significant investments; (3) would lose their rights to the public domain if they did not explore the claim; (4) bore the burden of outlining the scope of the claim; (5) gained priority advantages if first to claim; and (6) could transfer their rights to the claim. Professor Kitch then discussed the benefits of the prospecting system. First, Professor Kitch said that a broad grant to a single patentholder leads to a more centralized investment in follow-on innovations. Second, Professor Kitch added that the prospecting system made investments in implementation more appropriable. Third, Professor Kitch stated that the prospect model reduces transaction costs and facilitates coordination between firms that invest in the field. According to Professor Kitch, the prospect feature of the system also reduces the amount of expenditures required for protection (especially compared to trade secrets) and aligns the incentives of firms investing in the field.

Professor Kitch then discussed how the benefits of the prospect model had implications for government policy. First, with respect to patentability, Professor Kitch explained that the current test for invention — focusing on substantial novelty — is superior to the cost-based test that he advocated in a 1966 article. Second, Professor Kitch focused on the importance of ensuring that antitrust policy does not increase the costs of licensing and negotiation between patentholders and follow-on innovators. According to Professor Kitch, the ability and incentive of firms with different patent rights to license and cross-license each other and other firms are essential to the efficient functioning of the prospect model. Unwarranted antitrust intervention would, according to Professor Kitch, increase the social costs of the patent system.

Professor Kitch said that the 1995 Antitrust Guidelines for the Licensing of Intellectual Property were useful in reducing antitrust obstacles to efficient inter-firm coordination.

Professor Kitch concluded by contrasting the reward and prospect models for patent systems, focusing first on the pre-Bayh-Dole debate about whether firms should be permitted to patent inventions arising from publicly-funded research. According to Professor Kitch, under the "reward" model, firms that have already received government subsidies for their invention do not require the additional incentive of patent grants. But under the "prospect" model, patents may nevertheless be an effective mechanism for ensuring that follow-on innovation will occur, and occur in an orderly, efficient manner. While the reward model looks backward to determine whether a firm's investment justify patent protection, the prospect model focuses more on the future by enhancing incentives to innovate and reducing the cost of doing so. Similarly, while the reward model focuses on a single cycle of innovation, the prospect model assumes a more fluid and continuous process of innovation.

## **2. Professor Maureen A. O'Rourke**

Professor O'Rourke of Boston University School of Law offered her ideas on whether and how patent law should adopt a "fair use" defense to literal infringement akin to the statutory fair use defense found in copyright law.

At the outset, Professor O'Rourke said that it would be inappropriate to think of antitrust or intellectual property law separately or outside of a larger system designed to achieve an optimal level of incentives to innovate. Professor O'Rourke then focused on whether adjustments in patent law — specifically, a fair use defense for literal infringement — could improve incentives to innovate.

Professor O'Rourke turned to some background on why a fair use defense may be desirable. In the 1980s and early 1990s, computer and software vendors attempted to obtain intellectual property rights for Application Programming Interfaces ("APIs"), which could prevent vendors of complementary products from achieving interoperability with hardware or software without infringing. According to Professor O'Rourke, some objected to the use of copyright to leverage small bits of code into greater commercial power in markets characterized by network effects. Eventually, however, the courts — especially the Ninth Circuit — limited the ability of firms to assert API copyrights by strengthening the fair use defense or, in some cases, finding them uncopyrightable.

Hardware and software vendors turned instead to patent rights for APIs. Because standards for patentability are generally higher than standards for copyright, some thought that only truly innovative APIs would receive protection. According to Professor O'Rourke, however, standards for patenting APIs have not been as high as some had imagined. Moreover, strong patent protection can achieve a greater exclusionary effect as copyrighting APIs. Unlike copyright law, patent law does not permit a fair use defense to literal infringement, reducing the ability of vendors to make and sell complementary products without engaging in patent infringement. Moreover, because stronger IP rights enable firms to raise price further above marginal cost, Professor O'Rourke believes that patents in network markets can reduce the value of the network by reducing participation in them. A fair use defense, according to Professor O'Rourke, would create an incentive for licensing, not for infringement, though it might create differences between licensors and licensees over valuation in their negotiations.

Professor O'Rourke then discussed other ideas for overcoming barriers to compatibility that can arise from patentability and copyrightability of APIs. Professors Julie Cohen and Mark Lemley have suggested that patent law should codify a right to reverse engineer software. Professor Robert Merges has proposed "technological genericide" as yet another alternative, which would reduce or eliminate patent protection for inventions that become standards (akin to the rule in trademark law for products like band-aids and kleenex).

Because a fair use exception would be a more significant departure from existing patent law than proposals from Professors Cohen, Lemley, and Merges, Professor O'Rourke said that it might require broader justifications and perhaps more empirical support. Professor O'Rourke pointed to examples from the biotechnology field, where Professor Rebecca Eisenberg and others have suggested that the splintered and fragmented nature of intellectual property rights could lead to a "tragedy of the anti-commons" — dramatically higher transaction costs may lead to bargaining breakdowns and frustrate follow-on innovation. Professor Eisenberg has argued that biotechnology research should enjoy an exemption from infringement, especially since prospective licensees cannot capture diffuse social benefits that result from their research. Professor O'Rourke also cited work by Professors Merges and Richard Nelson showing that even a modest threat of non-infringement can dramatically increase the incentive of pioneer patent-holders to bargain with follow-on innovators. Professor Scott Keefe is now conduct empirical research whether patents are frustrating researchers in their effort to develop new or follow-on innovations.

Professor O'Rourke then discussed the alleged tension between intellectual property and antitrust law. According to Professor O'Rourke, the essential facilities doctrine could be used to ensure that innovation can continue to occur when intellectual property owners attempt to maintain control over their markets and prevent others from innovating. Professor O'Rourke suggested that although essential facilities doctrine had traditionally applied only to tangible property, the public interest associated with intellectual property makes the doctrine arguably even more applicable to refusals to license essential patents or copyrights.

### **3. Discussion with Professors Kitch and O'Rourke**

FTC staffer Hillary Greene opened discussion by asking whether a fair use exception would undermine certainty and reduce the value of patents. Professor O'Rourke said that it would not if the doctrine were reasonably clear; the Federal Circuit's control over patent law could make certainty and uniformity more likely to occur. Professor O'Rourke added that Professors Ian Ayres and Paul Klemperer had shown that uncertainty over the scope of patents can have significant social benefits.<sup>28</sup>

FTC staffer Bill Cohen asked how a fair use exception would affect the incentives of firms with blocking patents to license each other. Professor O'Rourke replied that it is uncertain whether blocking patents result in more licensing; the parties often have significant differences in valuing their innovations. Professor O'Rourke also pointed out that a fair use exception need not be equivalent to a royalty-free compulsory license.

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<sup>28</sup> Ayres & Klemperer, Limiting Patentee's Market Power Without Reducing Innovation Incentives: The Perverse Benefits of Uncertainty and Non-Injunctive Remedies, *97 Mich. L. Rev.* 985 (1999).

Professor Kitch then offered some of his views on a fair use exception under patent law. According to Professor Kitch, he has always been troubled by the limited nature of the experimental use exception in patent law. Researchers should be able to investigate without infringing. Professor Kitch does not believe that infringement doctrines need to remain static in order for the "prospect" model to continue to work successfully. But Professor Kitch cautioned against potential unintended consequences of a fair use exception — consequences that would result from the open-ended discovery system in U.S. courts and the cost and time associated with litigation.

Professor Kitch also noted his agreement with Professor O'Rourke that essential facilities doctrine might apply to intellectual property rights. According to Professor Kitch, the doctrine would apply because tangible and intangible property are the same, not because they are different. Professor Kitch believes that the doctrine could be fine-tuned for the intellectual property context. Professor O'Rourke noted, however, that the Federal Circuit's dicta in *Intergraph Corp. v. Intel Corp.*<sup>29</sup> undermined the application of the essential facilities doctrine to intellectual property by suggesting that a patentholder's exercise of its right to exclude can never give rise to antitrust liability.

Professor Kitch also discussed how antitrust law may raise transaction costs and reduce the efficiency of the prospect model. Even in the absence of antitrust law, licensing, according to Professor Kitch, would be a costly process. But antitrust law in the United States arguably creates even more significant barriers by reducing the willingness of rivals to communicate with each other. Contrasting American companies with their Japanese counterparts, Professor Kitch said that overcompliance with antitrust laws may force American companies to forego socially useful communication. Professor Wes Cohen suggested, however, that a lot of informal communications occur between Japanese and American companies under the radar of top management.

Professor O'Rourke asked Professor Kitch whether the prospect model may work better for some industries than for others, especially where cross-licensing is prevalent. Professor Kitch said that our patent system has functioned more efficiently by not incorporating exceptions or extensions for particular industries. Patent law therefore does not have to anticipate technological evolution or economic impacts; outsiders also are able to get a more effective hearing in a patent system that does not cater to specific industries.

Mr. Langenfeld concluded the session by discussing economic aspects of the FTC's recent enforcement actions against patent litigation settlements between branded and generic pharmaceutical manufacturers. Mr. Langenfeld cautioned that the FTC needed to consider a broader set of efficiencies that result from cross-licensing and settlement agreements that would include the positive incentives for branded manufacturers to continue innovating. Enforcement actions against settlements could, according to Mr. Langenfeld have adverse effects in other markets outside the scope of enforcement action. Mr. Langenfeld said that the efficiencies defense should not be limited to a single antitrust market.

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<sup>29</sup> 195 F.3d 1346 (Fed. Cir. 1999).

## AFTERNOON SESSION

### 1. Philip B. Nelson<sup>30</sup>

Philip Nelson, a Principal at Economists Incorporated, began the afternoon hearings with a discussion of the potential relationship between market structure and innovation. Three articulations of the relationship are the “Schumpeterian Hypothesis,” that innovation shapes market structure and that market structure and innovation are simultaneously shaped by underlying market characteristics like innovative opportunities and appropriability. The Schumpeterian Hypothesis holds that large firms in concentrated markets are more likely to support innovation.

According to Nelson, there is some theoretical support for the Schumpeterian Hypothesis. A larger scale firm may benefit more from an innovation (e.g., percentage cost reduction applied to a larger volume). A large diversified business may allow a firm to capture more benefits from an innovation. Large firms may be able to support a larger portfolio of research and development efforts, increasing the likelihood that the firm will develop an improved product or process, may have scale advantages in the research and development process and may be better positioned to finance large-scale research and development. Large firms may also market innovations more effectively. Notwithstanding the foregoing, theoretical research also indicates that a monopolist can have less incentive to innovate. In 1962, Professor Kenneth Arrow showed that a competitor can profit more than a monopolist from innovation. Others have argued that large firms’ organizational structures can deter innovative activity.

The empirical evidence related to the Schumpeterian Hypothesis is mixed. Some early studies of the United States and other leading nations found a positive correlation between concentration/firm size and a measure of innovation. Some studies found non-linear relationships that suggest that innovative activity increases with firm size and concentration to some point, then levels off or declines. These early studies employed simple models, used aggregated data and did not always control for industry effects. Case studies show that a significant number of major inventions come from smaller firms without major research and development facilities. The 2000 Economic Report of the President indicates that large firms fund most of research and development but that small firm research and development has been increasing faster. The evidence compared 1993 and 1998 values. The 1998 values, however, were at the height of the “Internet boom” and may reflect unsustainable or anomalous amounts on the part of small firms.

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<sup>30</sup> Mr. Nelson's powerpoint presentation may be found at [www.ftc.gov/opp/intellect/nelson.pdf](http://www.ftc.gov/opp/intellect/nelson.pdf).

More recent evidence considers the possibility that research and development intensity and market structure are both determined by other market characteristics. Levin & Reiss (1984, 1988) studied research and development and concentration in simultaneous equations models controlling for technical opportunity and appropriability conditions using “LOB and survey data. Symeonidis (1996) states that “[r]ecent empirical work suggests that research and development intensity and market structure are jointly determined by technology, the characteristics of demand, the institutional framework, strategic interaction and chance.”

Mr. Nelson suggested that innovation may lead to increased concentration. Patent protection and trade secrets can insulate innovators therefore increasing concentration. Even without intellectual property protection, innovators may be insulated from competition. Costs of duplicating unpatented new products can be large—exceeding 50 percent of original innovation costs. Network effects, learning and other structural characteristics of the market may insulate first movers. On the other hand, innovation may also reduce market concentration. Some studies have found that innovation can lead to growth of smaller firms or entry. Other studies have found that innovative activity is associated with both higher and lower levels of concentration, depending on the nature of the research and development effort. When research and development is focused on the development of new products, it tends to be associated with lower concentration. When research and development is focused on the development of new production processes, it tends to be associated with higher levels of concentration.

In addition, market concentration and innovation may be simultaneously shaped by fundamental market characteristics. Professor Michael Scherer states that “the market structure affecting research and development decisions is not given, but endogenously determined by technology and competition.” Inter-industry differences in technological opportunity appear to have much greater power in explaining varying innovation intensities than differences in concentration. Richer data sets and more recent theoretical work suggest the existence of complicated simultaneous relationships. Research and development varies across industries. At about 35.7 percent, computer and electronic products typically had the highest research and development funds as a percentage of manufacturing research and developments funds in 2000. At 3.1 percent, electrical equipment, appliances and components had the smallest. On the other hand, using research and developments funds as a percentage of sales of manufacturing industries, pharmaceuticals and medicines had the highest percentage at about 9.8 percent. Electrical equipment, appliances and components had the smallest at 2.1 percent.

There are several different characteristics of innovative activity. The types of research and development vary: “product” versus “process and basic” versus “applied” research and development. Most research and development is product at roughly 75 percent according to some estimates. Basic research and development is a small percentage of total research and development at about 5 percent. Universities, non-profits and government labs play a more significant role in basic research and development than others. The cost of research and

development varies. Innovation can be expensive especially during later stages. This varies across projects and industries, however. In addition, the funding source varies. Much innovative activity is privately funded, although public funding plays an important role in some research and development efforts. The risks also vary. Successful innovation is not certain. There is often a random component. Risk varies across projects and over the lifecycle of an innovation. Technical opportunities vary. Innovative opportunities vary across industries and over time. What has gone before contributes to what is possible today. Furthermore, complementary technology varies. The introduction of a successful innovation may require access to complementary capabilities of intellectual property. Supporting inventions may be required before the original innovation is technically or economically viable. Industry interfaces may also vary. Inventions by one industry often must be accepted by another industry before consumers benefit. Indeed, studies have shown that innovative ideas often come from outside of the firm that implemented them. Technical challenges vary. The challenges posed by the innovative process vary over the life cycle of an innovation. This implies that the capabilities needed to clear the hurdles at different stages of the process differ. Lastly, appropriability varies. Innovations vary with respect to the costs others would incur to replicate the invention or take advantage of it.

Mr. Nelson ended his discussion with some conclusions. The empirical work is complicated. There are several related endogenous variables. There is a need to control for changes in demand. And there is a need to correct lags—innovation may be pulled by lagged demand, and theory implies that historical profits support increased innovation. Nonetheless, economics have learned much. There does not appear to be a simple relationship between innovation and market concentration: market concentration and innovative activity are both the product of a number of economic relationships that vary across market environments.

## 2. Shane Greenstein<sup>31</sup>

Shane Greenstein, a professor at the Kellogg School of Management at Northwestern University, spoke next on concentrating on market structure and innovation. Greenstein began with a brief synopsis of the literature. For Professor Greenstein, the main message from the literature is that one does see competitive behavior by dominant firms in innovative markets but that there are concerns about non-innovative tactics that are not in a buyer's interest. The central question is whether there should be special scrutiny for large firms in innovative markets. This question is important principally because the economy is driven so much now by technological change. The question is difficult because of the uncertainties in high tech markets. Tactical behavior may give an advantage but that advantage is ephemeral because of the nature of high tech market structure. The question is also difficult because policy generally seeks robust commercial experimentation.

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<sup>31</sup> His powerpoint presentation may be found at [www.ftc.gov/opp/intellect/greenstein.htm](http://www.ftc.gov/opp/intellect/greenstein.htm).

The traditional approach to the question of market structure and innovation focused on the concern that monopolies do not innovate because innovation would result in the cannibalization of rents. The contrasting view is that monopolies use innovation to preserve their position. Monopolies have more to lose than the entrant has to gain. Professor Greenstein wondered if this contrast is real or rather simply semantic—the monopolist is “protected” or “threatened.” “Threatened” could mean “competitive.” Professor Greenstein feels that these insights are awkward to put into a practical policy. Generally, monopolies should not be protected from innovation.

Recent thinking on the issue has focused on reframing the central question. The setting for technology markets involves several key elements: a widely distributed technical knowledge, the assets being held by incumbent firms raise value of inventions and entrants either compete or contract. To Professor Greenstein, policy issues arise when the assets are valuable. Entrants commercialize inventions by cooperating with incumbents or competing against them. The effectiveness of intellectual property shapes the outcomes. When entrants can exclude imitation, licensing and joint ventures are common. The markets for the technology arise. When the entrants cannot exclude imitation, bargaining influences incentives and behavior. Ultimately, a wide range of behavior shapes innovation. Reputation and commitment-to-deal process as well as offering information as a carrot or stick for cooperative behavior arise. Cisco, for example, let the market know the standards for when and what it would buy and for how much. This encouraged companies to shape their strategic behavior to suit Cisco rather than their own needs. Microsoft uses access to its APIs as both carrots and sticks. Either the company behaves in the way Microsoft wants (in which event it will receive access to the APIs), or it does not (in which event access to the APIs will be withdrawn). Recent thinking focuses on both structure and conduct. Intellectual property can contribute to its use by markets. But where intellectual property is weak, the incentive to innovate may go down. While a market might have greater access to innovations, there are less of them to use. Professor Greenstein believes that a special scrutiny should be given to incumbents but the specifics need to be worked out. Professor Greenstein suggested a test—is there market power; are non-innovative tactics shaping the “innovative” behavior; and are the tactics used in the user’s interest?

Professor Greenstein offered the example of Microsoft’s restrictions on the ability of original equipment manufacturers to alter the first screen that appears on a new computer when the user first boots it up. Microsoft has market power. There are few alternatives. Microsoft has non-innovative reasons for imposing the restriction. It diminishes innovation at other firms and protects Microsoft. There is also no apparent user gain. Users are encumbered by Microsoft’s choice with no upside. Professor Greenstein’s conclusion was that the requirements were non-innovative—that they were designed to move competition away from innovative competition.

Professor Greenstein then reiterated his main message. Public policy can discourage the use of non-innovative tactics. This question arises often in information technology markets. The recent thinking examines both structure and conduct. The policy works through mechanisms—shaping entry and bargaining. Lastly, policy can discourage powerful firms from using non-innovative tactics to get closer to innovative competition.

### 3. Joshua Lerner<sup>32</sup>

Harvard Business School Professor Josh Lerner from Harvard University (also affiliated with the National Bureau of Economic Research) then addressed the issue of “patent thickets.” A patent thicket is a collection of patents so dense that many cannot tell what exactly has been patented and what has not. The lack of transparency reduces the incentives to innovate.

He began with an overview of the patent landscape. The creation of the United States Court of Appeals for the Federal Circuit represented a profound change in the United States patent system. The increasing filing and litigation of patents have been consequences. There are numerous reasons for concern about the impact on innovation and competition. Lerner believes that there is intense competition between firms in high technology markets. Technology races with substantial first mover advantages, the ability of venture capital to chose from dozens of competing proposals and clear title to intellectual property all encourage strong competition. The creation of the Federal Circuit centralized appellate court proceedings in patents in 1982. At the time, the creation of the court was for benign purposes—to prevent forum shopping by litigants. Over the last few years, however, the court has shifted to a more “pro-patent” stance. In the previous 30 years, only 62 percent of infringement findings were upheld. In the first 8 years since the creation of the Federal Circuit, almost 90 percent of the infringement holdings were upheld. This shift had several significant consequences. There is a greater willingness to file for and litigate patent awards. The number of patent filings by United States corporations between 1988 and 2000 have doubled. This increase could represent the change in pace of technological change. From 1981 to 2000, there has been a three-fold increase in the amount of patent litigation. The cost of this litigation may represent up to 25 percent of basic research spending. There has been an increase in the amount of internal resources dedicated to patent activities. There has also been a growth in litigation between new and established firms.

Behavior of patent holders has also changed. Established firms have sought to license portfolios of long-issued patents. This may lead in some cases to substantial transfers from newest and far more innovative firms. It may also affect the newer firms’ choices when deciding which innovations to pursue. This growth has also spurred individual inventors to try “hold up” established players. There is the unilateral nature of the threat (e.g., preliminary

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<sup>32</sup> Professor Lerner's presentation may be found at [www.ftc.gov/opp/intellect/lerner.pdf](http://www.ftc.gov/opp/intellect/lerner.pdf).

injunctions), the uncertainty of litigation and often settlement is the preferred response. These problems are particularly severe in emerging industries. There is also a lack of experienced examiners at the United States Patent and Trademark Office that leads to the issuance of many potentially invalid patents. The PTO also has difficulty retaining examiners. And these challenges are particular when there is substantial non-patent prior art. Professor Lerner offered the sample of a financial patent covering non-expiring options. The patentee had used unique vocabulary to describe the process. When the examiner typed the vocabulary into his databases to find prior art, he was unable to find it described and allowed the patent to issue. It turns out, however, that the concept of non-expiring options have been used for years, but described using different vocabulary. The holder of the patent is seeking to license it. Professor Lerner believes that the Federal Circuit, which has influenced behavior both in and out of court, as well as an increased number of questionable patents have adversely affected innovation.

Professor Lerner then described the difficulties of altering the current system. According to Professor Lerner, the system is very resistant to change. Many reform efforts have been resisted over many decades. The “independent inventor” lobby has been most active even though the current system arguably causes them the most difficulties. And, lastly, there has been limited input by economists in recent debates. The key barriers to change include the complexity of the issues involved, the failure of lawyers and economists to promote dialogue on these issues and the presence of differing incentives (small, well-connected groups benefit from complex, litigious system; a much more diverse group is harmed). Professor Lerner believes that patent quality is a key first step.

#### 4. Janusz Ordover

Janusz Ordover, Professor of Economics at New York University and a former Deputy Assistant Attorney General for Economics at the Antitrust Division of the Department of Justice, spoke next.<sup>33</sup> Generally, Professor Ordover feels that traditional antitrust policy can meet the challenges of the new economy. But there are some things to consider.

Professor Ordover began with a summary of what he believed were the properties of the new economy:

- *falling average costs;*
  
- *lowering capital investments;*

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<sup>33</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020220januszordover.pdf](http://www.ftc.gov/opp/intellect/020220januszordover.pdf).

- *high rates of innovation;*
- *frequent entry and exist with substantial variance in the types; and,*
- *network externalities.*

One aspect of high tech markets is falling average costs. It costs almost nothing, for example, for a company to produce another copy of its software. The costs are primarily borne with regard to the creation of the product. Professor Ordover believes that equilibrium in a high tech market will contain few firms. As a result, marginal cost as a metric of market power may not be sufficient. One option would be to examine pricing. Is it unsophisticated or sophisticated? Evidence of sophisticated pricing includes bundling and tying as well as price discrimination. Price discrimination has traditionally been seen as evidence of market power. But is that the proper inference in high tech markets? Sophisticated pricing may actually be an equilibrium solution in high tech markets. Pricing, however, may be used to lock in customers and competitors out. One should monitor usage much more closely.

Externalities also play a role. The incumbent firm has an incentive to price actively in the first term. It may price below average variable cost during that term. Traditional theory suggests that even if an incumbent were to win in the first period, a challenger with the same cost structure in the second term as in the first should be able to challenge successfully in the second period because the below cost pricing of the incumbent in the first period is unsustainable. This may not be the case in network markets. Once the incumbent has succeeded in establishing a “critical mass” of customers, it would be much more costly for the challenger to take customers away in the second period.

Finally, vertical integration should also be considered. The issue of vertical integration is one of access. If a company controls access of distribution, it will control what is innovated and the pace of innovation. Open access to those means of distribution is the appropriate pulse. In addition, one should also look at the timing and scope of access. Who controls the assets? What firms are seeking those assets? What can they do with those assets? And, of course, at what price is access being granted. Professor Ordover talked about the slippery slope of pricing under the Telecom Act. The Telecom Act required sale of unbundled network elements over six years ago. We still don't know what the price should be. Lastly, the question of what rate of access is also necessary to consider.

Professor Ordover believes that competition for the next round of technology should be open to allow both incumbent firms as well as challengers to compete.

## 5. Discussion

The group then engaged in a discussion of the issues raised in the presentation.

The first question asked was with regard to the proper measure for innovation. Was it research and development expenditures absolutely? Or perhaps some ratio between research and development to sales? Should there be more interest in the inputs or the outputs? Mr. Nelson suggested that the emphasis should be on the outputs although the system is imperfect. Professor Lerner suggested that it depends on the field. In financial services, there is a high rate of innovation and a low number of patents. Moreover, some accounting reports may not record the expenditures, so it would be difficult to measure.

The group then discussed the relationship between strong intellectual property rights and innovation. Strong intellectual property rights can give new entrants bargaining chips with regard to entrenched monopolists. The problem is that strong intellectual property rights may discourage inventors from inventing in the first place. There have been some observations about this phenomenon. Some use intellectual property for the purpose of licensing rather than creating. Some companies will use intellectual property rights as a stick to get what they want like Intel did in the Intergraph case. Unfortunately, the full range of behavior has not been explored. Patents allow things to happen that might not otherwise. In biotechnology, for example, companies enter into a great deal of alliances. Patents allow these alliances. Another issue is competition for venture capital. In new emerging industries, at best one could describe what is going on as a “land grab.” The affect of unclear patents on the competition for venture capital funding is that good ideas with perhaps unclear intellectual property titles are not getting funding. The presumption is that where there is smoke, there is fire.

The next question was what could be done about it. Professor Ordover suggested that limiting the right to sue would have First Amendment implications. Professor Lerner suggested that the PTO should have increased funding and education so that they could examine the proposed patents more closely and avoid some of the problems. Also suggested was that the loser pays and perhaps be susceptible to treble damages. Raymond Chen of the PTO suggested that “nuisance suit” and unfair competition causes of action are suitable and more aggressive forms of reform might not be necessary. He also suggested that there were viable patent reexamination procedures in place. Professor Lerner suggested that the reexamination procedure

was not as viable as perhaps the PTO representative had suggested. Professor Lerner believes that the issue should be reevaluated.

## 6. Lawrence White

After the break, Professor Lawrence White spoke.<sup>34</sup> Professor White is a Professor of Economics at New York University's Stern School of Business. Professor White discussed various economic aspects of network industries and how they relate to intellectual property.

Professor White first began by describing the different types of networks. The first is the "S" type network. An S network is essentially a hub and spoke network. An example Professor White cited was FedEx when it first started. The second type of network is the ring network. Professor White analogized the ring network to the Beltway around Washington. While it is possible for people to navigate through the city streets of Washington, most people drive around the city on the Beltway. Third, Professor White mentioned the all-points network. An all-points network is a network that does not have a central distribution point. Professor White offered citizen's band radio as an example. Lastly, Professor White mentioned the two star networks connected by a bridge. Analogies included two local exchange networks connected by a long distance line; a railroad; airlines with hubs; or electricity. Professor White distinguished between a single star network, "S1," and a two star network, "S2."

Professor White then raised the issue as to why network industries are different, focusing primarily on network externalities. Generally, the more parties that are on a network, the more valuable participation becomes. This type of externality is a direct externality. The value increases up to the point where congestion starts limiting the incremental value to the other participants a new participant brings. The other types of networks are one-way, where the added participant does not increase the value of participation to the other participants. In fact, in these types of networks, no one notices the other participants until there is congestion. There are indirect externalities in these one-way networks. Economies of scale is one example. The added participant may increase the desirability of distributing over the network. An example would be a credit card network. While a user may not necessarily gain a personal benefit because another participant joined the network, because more people are participating on the network, more vendors are likely to take the card. Software is another example. While an individual will not directly experience the benefit of having another participant use a particular operating system, the more people using the operating system, the more people will produce applications for that operating system.

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<sup>34</sup> Professor White's presentation may be found at [www.ftc.gov/opp/intellect/white.pdf](http://www.ftc.gov/opp/intellect/white.pdf).

Other characteristics include high fixed costs, low marginal costs, economies of scale; network advantages will increase up to the point where congestion may become a problem. Professor White also felt that compatibility standards are significant. Professor White then mentioned the railroad industry. Railroads are a network industry—a 19th century network industry. The issue of rail gauge was significant in the 19th century. Up until 1861, almost half of the United States rail network was a different gauge than the other half. Intellectual property plays a role, Professor White feels, in a network industry because so many of the technological standards are based on proprietary technology.

Professor White then addressed the consequences. Most outcomes are winner-take-all. One gets competition for dominance in these types of industries. In those instances, making sure the process is open is important. Path dependence is also a significant issue. In the case of railroads, the introduction of a divergent gauge that would, in effect, create a second network. One cannot, for example, take a train from the north of Europe past Barcelona because the gauge of the track is different in Spain. Same in Russia. The Russian gauge is different than the rest of Europe. The same is true with electricity. Some countries have 60 cycles; others have 50. Professor White asked whether some went down the wrong path on some standards. Professor White then raised the issue of what one loses from incompatibilities and abandoned technologies. In the American rail case, Professor White suggests, we had freight being slowed down, off-loaded and reloaded because the two systems were not compatible. After 1861, the country harmonized the standards, but had to do so by ripping up the non-standard gauge and replacing it. Railcars also had to be changed as well. Lastly, Professor White mentioned the bottleneck. Professor White noted that sometimes the bottleneck is a proprietary technology (which again raises intellectual property issues). Sometimes the bottleneck is a physical switch. Professor White also suggested that it could be a pricing or practices issue.

Entry is also more difficult in a network situation. Sampling is harder, and larger scale entry is required. Innovation is complex. Innovation within the existing technological standard can happen readily, Professor White felt, except perhaps where the incumbent feels threatened by the technology. Professor White sees this condition as the core of the *Microsoft* case. Professor White also suggested that innovation could be perceived by the dominant firm as undermining its ability to price discriminate. Professor White felt the ramifications of price discrimination on consumer welfare were ambiguous, but the effect on the ability to price discriminate may also hinder innovation. Innovation outside the standard is harder. It requires a larger scale and sampling is difficult. If you can make modifications to a railcar that fits on the standard gauge, those innovations may be well received. If, however, your innovation requires the use of a different gauge, that innovation stands a much smaller chance of succeeding.

Professor White then addressed policy implications. First, he suggested being wary. Professor White did recognize that there are problems with dominant firms squelching innovation. Overreaction, Professor White felt, could penalize winners and reward losers.

Professor White also felt that bottleneck problems are real. On one hand, single firm ownership may create dominance. Intellectual property plays a role there. There is also the possibility of joint agreements that may be unduly exclusionary, eliminating or impairing mavericks who threaten incumbents. Professor White suggested that “if there is something called an essential facilities doctrine, if any, it would be useful to clarify it.”

Professor White concluded by saying that there were not easy answers. He also stated that good policy requires good judgments and long term thinking. The same is true in intellectual property, Professor White felt. Often times, in the short run it appears that the benefits lie with restricting the granting of intellectual property rights. The more intellectual property falls into the public domain, the more competition. Professor White feels, however, that this vision might be too short term. If you open up too much intellectual property to the public domain, you disincentivize people to innovate.

#### 7. Margaret Guerin-Calvert

Margaret Guerin-Calvert, a principal at Economists, Inc., spoke next.<sup>35</sup> Ms. Guerin-Calvert indicated that she would talk about the economic literature in the network industry looking at what is said with regard to intellectual property and what are the “thorny” intellectual property issues that are particularly relevant in network industries.

Ms. Guerin-Calvert first noted that the 1995 Intellectual Property Guidelines have no examples of network industries. She said that issues like standard setting, cross-licensing and exclusivity are discussed in the Guidelines, and that these issues are all relevant in the network context. If one examines both the history of enforcement and private litigation between 1995 and the present, however, a different story emerges. We now have a lot of material on the overlap between standard setting in joint venture networks, exclusionary practices in cross-licensing and patent pools in the network context.

There is now a vast literature on network effects. It deals with general principles that apply in any kind of network context and helps distinguish among networks. Ms. Guerin-Calvert did not repeat what the literature taught, citing Professor White’s presentation. She did point out one distinction. A lot of the literature looks at the network as a system—as a whole package of transmission, distribution and end-users. In the financial network areas, the literature looks at the network as a means of delivery a product, such as the ability to get cash from an ATM. Ms. Guerin-Calvert noted that that can be a significant distinction for standard setting and for which intellectual property issues may be relevant.

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<sup>35</sup> Her presentation may be found at [www.ftc.gov/opp/intellect/guerincalvert.pdf](http://www.ftc.gov/opp/intellect/guerincalvert.pdf).

Ms. Guerin-Calvert also noted that it is important to separate the demand-side externalities (the things that make the value of the network increase as it gets larger like critical mass) from supply-side externalities (the things that make it more desirable to distribute one's goods or services over a network). The supply-side externalities are more plain vanilla, according to Ms. Guerin-Calvert. These cover decreasing average costs over some range of production. Ms. Guerin-Calvert also noted that the nature and extent of these externalities are going to vary depending on, perhaps, industry and technology.

Specifically, network entry and competition analysis gives a lot of perspective on what kinds of intellectual property issues should be relevant. In addition, the elements and attributes of a network determine the market outcomes. For example, the technology can determine whether the resulting network will have a single firm or multiple firms. These outcomes will also determine where the competitive focus should be. Should it be on the process of creating the network knowing that a single firm will eventually control the network, or on insuring that multiple networks are allowed to flourish because that is the optimal outcome? Professor Ordober calls this *ex ante* versus *ex post* competition either within or among networks for competition. It is not necessarily the case that in every network one should be concerned with standard setting. Particularly if the outcome is a multi-firm network.

Ms. Guerin-Calvert then offered two stylized fact patterns. One is where the fight is to become the monopolist. The second is where you can have multiple networks and where competition really is inter-network to get the volumes or users. In terms of examining network entry, the key is to look at what is necessary to achieve the demand and supply side externalities. Does intellectual property assist or impede network development in those situations? One of the principal issues is switching costs. Not all networks have high switching costs. Most people, Ms. Guerin-Calvert believes, have multiple ATM and credit cards. It is probably not the case, however, that most people have multiple fax machines. Lastly, the size of the pie is relevant. It may be in the interests of a railroad to encourage a single standard because the amount of traffic encouraged by a single standard will be greater. A firm could have more of that pie (although relatively a smaller slice) than a smaller pie that only it controls.

One of the key policy issues, according to Ms. Guerin-Calvert, is the issue of innovation. Ms. Guerin-Calvert believes that this area has been well developed by Carl Shapiro and Hal Varian as well as David Teece. One of the issues is whether the innovation is incremental. Essentially, this type of innovation is taking a product as it is currently and making sufficient changes or improvements so that one has a better, more attractive product. It is sufficiently incremental that those users on the original network do not have to make a quantum change. As a result, it is easier to evolve and grow. The possibility of "making a big splash" in this type of environment is less than in other situations, but the probability of having some

success is higher. In contrast, there is the radical or revolutionary innovation. The problem here is incompatibility. In this context, users have to make quantum leaps. But there is also the chance that a single provider could take the entire market. If the incumbents control the technology by virtue of patents or other intellectual property, it is less attractive to take the incremental approach. Arguably, Ms. Guerin-Calvert believes, one might be forced into taking the high-risk approach.

Ultimately, Ms. Guerin-Calvert believes the starting point is classifying the network based on its attributes, type, properties and hurdles for entry and expansion. These questions will indicate where the tensions are and how important is it to have open standards, common ownership of assets or deployment of complementary assets, and where, absent certain kinds of protection, one will not have the product at all.

Ms. Guerin-Calvert concluded with “the other side of the coin”—exclusionary practices. Exclusionary practices may be necessary to create the network in the first place. But they may deter entry or create foreclosure. With regard to intellectual property, the issues center on coordination, standard setting and exclusivity. On the network side, the principal tension is between the need to encourage networks and activities that can facilitate coordination.

## 8. Stanley Liebowitz

Professor Stanley Liebowitz spoke last.<sup>36</sup> Professor Liebowitz is a professor of economics at the University of Texas at Dallas. Liebowitz began with a discussion of the difference between the terms “network effect” and “network externality.” A network effect is defined as when a product becomes more valuable, the more consumers there are that use it. That does not necessarily mean that there is any sort of network externality. Externalities, according to Liebowitz are usually bad things. Normally, externalities cause the market not to function properly, particularly if they are technological externalities and not pecuniary externalities.

In some networks like fax machines and telephones, the structure of the network is fairly clear. The network is not going to be worth much if you are the only person with a fax machine. Network effects in these industries are important. There are other networks, like software networks (or “virtual networks”), however, where the effects are not that clear. Liebowitz noted that there is a lot of literature out there on the topic, but most of it is theoretical. There is little examining things like the strength of network effects and where they can be located. There is little examining whether there are really network effects in software or their

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<sup>36</sup> His presentation may be found at [www.ftc.gov/opp/intellect/liebowitz.pdf](http://www.ftc.gov/opp/intellect/liebowitz.pdf).

economic significance. To Liebowitz, there are only a handful that actually take a serious look at network effects in software markets and try to measure the strength of the effects. Liebowitz then outlined the history of the literature. The literature of the 1970's took a look at telephone networks. The modern literature began around 1950.

The literature that began in 1985 talks about what happens when you get stuck with the wrong network. But Liebowitz believes that network effects theory is not required to tell the story. To Liebowitz, any natural monopoly raises the issue of whether consumers receive the "wrong" natural monopoly. Liebowitz believes that it was the literature of Katz, Shapiro, Fowler, Brian Arthur and Paul David who used network effects theory to discuss questions about the quality of natural monopolies. Liebowitz feels, however, that one could have gotten to the same result with traditional economic analysis focusing on economies of scale.

Liebowitz then suggested that the concept of network effects is overused. He referred to an article that appeared in the *Wall Street Journal* suggesting that supply and demand were dead. The article suggested that television networks are "obviously" networks. Liebowitz believes that it is hard to find true network effects in television broadcasting. He suggests that television networks may be networks without network effects. Viewers don't care, according to Liebowitz, how many other people are watching their program. The number of people watching the program does not affect their utility directly. Ultimately, Liebowitz suggested that simply because something has the word "network" in it does not mean that there are network effects.

Liebowitz then discussed studies of the spreadsheet software market. If someone wanted to share data saved in a Lotus 123 spreadsheet, the person with whom the individual wished to share the data had to have Lotus 123 as well. The tests showed that there were, indeed, network effects. According to Liebowitz, however, the study did not examine upgrades. Liebowitz suggests there is no empirical evidence of how strong network effects are in any of these literal networks. Liebowitz is not saying that network effects do not exist; he is just saying that there is no empirical evidence that they do. Liebowitz does state that there is a large amount of literature discussing network effects, but most of it presumes the existence of network effects and their power to affect competition.

Liebowitz then stated that if there is a network effect, it gives economies of scale on the demand side. These economies of scale might lead to a winner-take-all situation. Network effects, however, cannot by themselves generate that result. Economies of scale of production, without network effects, can; but if one enjoys only economies of scale in production, one does not necessarily benefit from network effects. In most cases involving the new economy, participants have very strong economies of scale in production -- minor network effects play a trivial role in these industries. To Liebowitz, it is not clear how much his characterization changes the story, but it is still a different story.

Whether one is talking about economies of scale or network effects, both lead to the conclusion that a market may have just a single winner. The key issue is whether there is going to be competition for markets or competition within markets. Liebowitz isn't sure. But he does ask whether it is harmful to have a single winner. It could be. Liebowitz looked at the software market and questioned whether purchasers were getting stuck with entrenched and inefficient incumbents who remain unchallenged by superior new firms. He discovered no evidence of entrenchment. There was evidence of winner-take-all competition, but little evidence of other aspects like tipping (which, to Liebowitz, is very difficult to define). Liebowitz also suggests that there was no evidence of lock-in. What he found was rapid shifts in market share to firms receiving better product reviews. Liebowitz said that his study focused on a single industry from 1985 to 1995, and that the industry was very young at the time. Liebowitz was not sure whether one could generalize the findings to a more mature industry or whether the findings would translate to other industries.

Liebowitz then suggests that the stories of lock-in (e.g., railroad gauges and alternating vs. direct current) are also exaggerated. Liebowitz also discussed the debate over the QWERTY keyboard and suggests that tales of lock-in there are also exaggerated. Some claim that the keyboard was created to slow down typing without much evidence to support the conclusion. Liebowitz suggests that the battle between Betamax and VHS is a similarly misunderstood story. Carl Shapiro has suggested that the Betamax/VHS conflict was ultimately about lock-in. Liebowitz thinks that the Betamax/VHS battle was determined by switching costs. The form of lock-in that Liebowitz is concerned about is a stronger form where consumers refuse to switch even when the advantages of switching are greater than the cost.

Liebowitz then discussed the implications of network externalities and economies of scale for antitrust. First, in those industries, there will be a different kind of competition. What we need to know, according to Liebowitz, is whether victory is based on economies of scale and whether there will be repeated attempts to displace the incumbent. That, according to Liebowitz is the question.

With regard to intellectual property, if there is a fight between two competing standards, it is fairly important in most cases that they are both owned or not owned. If they are both owned, one would expect the market to work better than if only one were owned. Intellectual property has nothing to do with trying to provide a reward for the inventive activity; it's ownership in the same way that one would want a fishery to be owned. It guarantees an efficient use of the fish. Liebowitz concludes that this analysis suggests a potential use for intellectual property.

## 9. Discussion

The group concluded with a discussion. Responding to Professor Liebowitz, Ms. Guerin-Calvert suggested that there are empirical studies of the airline industry (which examined the difference between pre- and post-regulation) and ATMs. The study of the airlines looked at the value of adding hubs and spokes by airlines (as opposed to single line traffic) in terms not just of economies of scale and scope on the supply side, but also in terms of the ability to offer seamless travel, common baggage handling, and coordinated schedules. Airlines offering those features enjoyed measurable increases in traffic. On the ATM side, the value of having more participants induced interoperability. The most interesting aspect of the studies, according to Ms. Guerin-Calvert, was that it may benefit society to have a single firm. Ms. Guerin-Calvert also suggested that in order for some of these products to exist, there should be more tolerance for joint ventures.

Professor Liebowitz responded by questioning whether the airlines were a network at all. There are hubs and spokes, but he questioned whether the airline industry really demonstrate network effects. Ms. Guerin-Calvert replied that greater numbers of users produce better services, which produces still more traffic. More passengers makes better service possible. Professor Liebowitz responded that he was not sure how much intellectual value you got by labeling that effect a "network effect." The original conception of network effects was more confined—cases where users truly derived more value directly from increases in the number of users.

Professor Greenstein offered a final remark. He did not think it was useful for antitrust policy to be directed toward deciding designs. Professor Greenstein also suggested that the economic relationships between all market participants may be more significant than the simple relationships between hubs and spokes in a network. What one should be concerned about from an antitrust perspective in those situations are entrenched entities at the hub—can they use their position to distort the innovative process? Professor Greenstein said that the quality of the outcome may not be nearly as important as the quality and nature of the process producing the outcome.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of Economic  
Perspectives on Intellectual Property,  
Competition and Innovation

February 25, 2002  
Berkeley, California

On February 25, 2002, the Federal Trade Commission and Antitrust Division of the U.S. Department of Justice continued their hearings on the implications of competition and intellectual property law and policy. The hearings shifted from Washington, D.C. to the University of California at Berkeley's Haas School of Business. The first Berkeley session was a general discussion of economic theories of intellectual property, competition and innovation. Panelists included:

- **Ashish Arora**, Visiting Professor of Economics, Stanford University, and Associate Professor of Economics and Public Policy, Carnegie Mellon University.
- **Kenneth Arrow**, Nobel Memorial Prize and Joan Kenney Professor of Economics Emeritus, and Professor of Operations Research Emeritus, Stanford University.
- **Richard J. Gilbert**, Professor of Economics, University of California, Berkeley.
- **Mark Lemley**, Professor of Law and Director, Berkeley Center for Law & Technology, University of California, Berkeley.
- **Daniel L. Rubinfeld**, Robert L. Bridges Professor of Law, and Professor of Economics, University of California, Berkeley.
- **Howard Shelanski**, Professor of Law, and Director, Berkeley Center for Law & Technology, University of California, Berkeley.
- **Hal R. Varian**, Dean, School of Information Management and Systems, and Professor, Haas School of Business and Department of Economics, University of California, Berkeley.

Below are summaries of individual presentations and group discussion.

## **Opening Remarks**

Commissioner Mozelle Thompson opened the session by discussing the general purpose of the hearings.<sup>37</sup> He said that patent, copyright and antitrust policy will drive the structure of industries as diverse as entertainment and biotechnology. According to Commissioner Thompson, antitrust enforcement is necessary to ensure that we continue to have a truly competitive economy that values and protects innovation -- principles also consistent with intellectual property law and policy.

Commissioner Thompson said that although antitrust and intellectual property policy are largely complementary, there had been tension in the past. At one point, the pendulum had swung too far against intellectual property, which reduced incentives to innovate by reducing the value of patents and copyright. Now, according to Commissioner Thompson, some feel that the pendulum has swung too far in favor of intellectual property, leading to a proliferation of patents, restrictive licensing terms, and patent thickets. The challenge for government agencies and the courts is striking the right balance between antitrust and intellectual property values. Economics, according to Commissioner Thompson, could serve as a theoretical bridge between the two and illuminate a middle road.

Commissioner Thompson pointed to recent Commission investigations involving intellectual property issues, including the *AOL/Time-Warner* merger, *Intel*, and *Dell*. According to Commissioner Thompson, although these cases gave the Commission valuable experience in dealing with antitrust issues involving intellectual property, the Commission is aware that it has much to learn, and hopes to learn much of it from these hearings.

Susan DeSanti, Deputy General Counsel at the FTC, then offered some additional opening remarks. The purpose of the opening session at Berkeley was to explore three basic questions: (1) how competition spurs innovation; (2) how intellectual property rights promote innovation; and (3) policy implications arising from theoretical and empirical studies of the relationships among competition, intellectual property rights and innovation.

## **Professor Richard J. Gilbert**

Professor Gilbert offered an individual presentation entitled, "Should Innovation Continue to Have A Role in Merger Policy?"<sup>38</sup>

First, Professor Gilbert offered arguments in favor of focusing on innovation in merger investigations. He pointed to economic evidence showing that the level and pace of innovation were important factors in market performance. Professor Gilbert then noted anecdotal evidence that competition promotes innovation. Among the examples were competition between MS-DOS and DR-DOS for PC operating system supremacy; the battle between Internet Explorer and Netscape Navigator for Web browser leadership; rivalry between foreign and domestic auto

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<sup>37</sup> Commissioner Thompson's opening remarks may be found at [www.ftc.gov/opp/intellect/mwtiphearings.htm](http://www.ftc.gov/opp/intellect/mwtiphearings.htm).

<sup>38</sup> Professor Gilbert's presentation may be found at [www.ftc.gov/opp/intellect/020225richgilbert.pdf](http://www.ftc.gov/opp/intellect/020225richgilbert.pdf).

companies for market share in the United States; and the response of telecommunications companies to market deregulation.

Professor Gilbert then examined some of the arguments against focusing on innovation in merger policy. The principal theoretical argument -- articulated most famously by economist Joseph Schumpeter -- is that monopoly promotes innovation by increasing the appropriability of investments in innovation, spreading the innovation across scale economies, and enabling the monopolist to receive and use cash flow to reinvest in innovation. The second, more practical argument is that it can be difficult for enforcement agencies and private practitioners to identify sources of innovation because research and development are typically secret. Professor Gilbert also noted that innovations often come from unexpected sources. A third argument is that the link between R&D expenditures and innovation can be quite weak. A final argument is that there is little empirical evidence demonstrating a connection between competition and innovation.

Professor Gilbert then used merger enforcement statistics to show that merger cases involving innovation markets (or focusing on effects on innovation in existing product markets) have not accounted for a significant number of enforcement actions over the last twelve years, though they have accounted for a greater number over time. From 1990 to 1994, there were only four merger cases at the FTC and DOJ with alleged effects on innovation, approximately 3% of all merger challenges over the period. From 1995 through 1999, there were 49 innovation-based merger challenges, 18% of the total. Thirty six of the latter challenges were from the FTC. But according to Professor Gilbert, the statistics from 1995 to 1999 overstate the number of merger cases truly focusing on innovation. Out of the 49 cases allegedly involving innovation, 35 could have been based on effects in markets for existing goods and services, and another 5 could have been based on "one-sided potential competition," where the merger combined a market incumbent with a firm whose product might enter the market in the near future. Only six to eight merger cases from 1995 through 1999 truly involved innovation markets, which Professor Gilbert characterized as "two-sided potential competition" cases. According to Professor Gilbert, the increasing use of boilerplate allegations in complaints accompanying merger consent decrees was a major factor in the overstated numbers from 1995 through 1999.

Professor Gilbert concluded with three basic points: (1) innovation is an important competitive variable and should continue to play a role in appropriate merger investigations; (2) innovation market cases have been rarer than the numbers might suggest; and (3) most innovation market cases have been sound, but should be evaluated further as part of the FTC's in-depth study of past merger enforcement actions.

### **Professor Daniel L. Rubinfeld**

Professor Rubinfeld offered his thoughts on how innovation and intellectual property may affect merger analysis.

First, Professor Rubinfeld discussed the general structure of the Horizontal Merger Guidelines, drawing a distinction between unilateral effects analysis -- which focuses principally on the closeness and loss of competition between the merging parties themselves -- and

coordination theories, which examine the effects of mergers in facilitating the ability of market participants to reach and maintain tacit terms of agreement. In horizontal mergers involving innovation, Professor Rubinfeld believes that the secrecy of R&D makes it difficult for market participants to reach, monitor or enforce any terms of tacit agreements involving innovation. Unilateral effects is therefore the more usual framework for examining effects on innovation.

Standard unilateral effects analysis focuses on how closely the merging parties compete, usually in the context of differentiated products (often consumer products). According to Professor Rubinfeld, unilateral effects theory is applied in two basic ways in the innovation context. First, the agencies will examine how closely the merging firms compete with respect to their innovation paths. Second, the agencies will attempt to determine whether the elimination of an independent competitor will leave too few innovators in the marketplace to provide vigorous competition in research and development. Professor Rubinfeld noted that there is not much theoretical work either validating or undermining the agencies' approach to innovation effects in horizontal merger investigations. Most evidence is anecdotal, involving some very interesting case studies.

Professor Rubinfeld then discussed innovation market cases involving either a potential monopolist or firms in a vertical relationship. Acquisitions in those contexts theoretically could lead to the suppression of independent R&D paths or foreclosure of rivals that may not have occurred in the absence of the transaction. Some, however, contend that such acquisitions could enhance innovation by enabling the acquiring firm to appropriate more of the rewards from successful innovation.

According to Professor Rubinfeld, the empirical work in these areas do not provide enough unambiguous evidence for the agencies to assume anything in these investigations. Some empirical work shows that successful innovators are profitable; other empirical work shows that most R&D is not successful. Results in the marketplace show that predicting successful R&D is very difficult. Smaller firms can be extremely productive and have played a significant role in many high-tech industries. Large firms, however, have also played important roles in research-intensive industries, especially in computers and semiconductors. In network markets, Professor Rubinfeld thinks that incumbents will innovate, but in a way likely to bias their own products. Professor Rubinfeld noted that Professors Michael Scherer and Douglas Ross have shown that diversity of firm size is an important factor in increasing innovation in particular markets.

Professor Rubinfeld then discussed Lockheed Martin's proposed acquisition of Northrop Grumman, which the Department of Justice challenged in federal court before the parties abandoned the transaction.<sup>39</sup> According to Professor Rubinfeld, the Antitrust Division was concerned about two potential anticompetitive effects on innovation. In some markets, DOJ was concerned that the merger would either result in a monopoly or duopoly. The loss of an independent innovation path in highly concentrated markets with high entry barriers gave DOJ

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<sup>39</sup> The Department's 1998 complaint can be found at [www.usdoj.gov/atr/cases/f1600/1609.htm](http://www.usdoj.gov/atr/cases/f1600/1609.htm). See also "Leap-Frog and Other Forms of Innovation," Address by Constance K. Robinson, Deputy Director of Operations, Antitrust Division (June 10, 1999) (discussing the Division's concerns about the impact of the Lockheed/Northrop merger on innovation), located at <http://www.usdoj.gov/atr/public/speeches/2482.htm>.

and the Department of Defense cause for concern. The second cause for concern arose from markets in which Lockheed/Northrop would gain the incentive and ability to withhold technical cooperation from rivals in areas where cooperation was essential to innovation.

Professor Rubinfeld concluded his presentation by observing that although the evidence is not overwhelming, he believes that competition is good for innovation.

### **Professor Howard Shelanski**

Professor Shelanski addressed whether and how antitrust enforcement should incorporate innovation (and incentives to innovate) in merger and nonmerger cases. He focused on economic theory and economic studies of the relationship between firm size, market structure and innovation.

Professor Shelanski began with an overview of Joseph Schumpeter's basic hypothesis that perfect competition is both an impossible and undesirable means of obtaining optimum levels of investments in innovation. Professor Shelanski also noted that some economists contended that firm size, not just market share, can be a significant determinant in whether firms will effectively innovate. Large firms can bear risks and attract important human and financial capital. Small firms are thought to be more creative and nimble. Some studies have shown that large firms have proportionally higher investments in R&D; other studies show that smaller firms have disproportionately high R&D expenditures. Still other studies show that large firms are more likely to make durable investments in ongoing R&D. Some of the more impressive studies also demonstrate that patterns of investment and innovation differ significantly across industries, suggesting that other factors beyond firm size and market share may be more significant factors in determining investments in R&D. According to Professor Shelanski, there does not appear to be a statistically significant relationship between size and innovation. Professor Shelanski noted that empirical studies of the relationship between firm size and number of patents do not, in his view, tell us much about how much innovation is occurring.

Professor Shelanski then discussed the relationship between market concentration and innovation. Some have suggested that the relationship between concentration and innovation (if plotted on an x-y axis) would be an inverted "U," with innovation increasing up to certain levels of concentration before declining as concentration tended to monopoly. But Professor Shelanski noted that fewer presume today that competition and atomistic market structures produce more innovation. Empirical studies have not resolved whether Schumpeter's hypothesis -- that dominant firms are more innovative -- is correct. The data are mixed, and the outcomes of studies depend significantly on the control variables. According to Professor Shelanski, the absence of appealing theoretical or empirical support for any single working hypothesis suggests that enforcers should not presume anticompetitive effects on innovation are likely to arise in any particular market contexts. Case-by-case analysis would be a better approach.

### **Professor Mark Lemley**

Professor Lemley began his presentation by noting that he would focus on patents and the patent system (instead of innovation), underscoring the diverse roles that patents play across industries.

Professor Lemley then discussed some of the more significant features of the patent system. First, Professor Lemley said that patents are easier to get in some industries than in others. As a general matter, in sectors with less prior art, patent prosecution is much easier. Second, Professor Lemley said that patents have different impacts on incentives to innovate across industries. According to Professor Lemley, industries with high R&D expenditures (such as biotechnology and pharmaceuticals) may require patent protection more than other industries may need in order to produce optimal incentives to innovate. Third, Professor Lemley discussed the distinction between discrete and cumulative innovation. Cumulative innovation tends to be more important in areas like software and the internet; discrete, self-contained inventions occur more frequently in the pharmaceutical industry. In industries where cumulative innovation is significant, the patent system (by awarding patents to improvers) implicitly assumes that pioneer patentholders can efficiently coordinate the subsequent development of the field (which itself assumes that efficient licensing can occur). If efficient licensing and coordination are likely to occur, it may be desirable to grant broad patents to pioneers. But if those assumptions are weak, more innovation may occur by granting narrower patents. Fourth, the role of patents in commercial product development is also heterogeneous across industries. In industries like pharmaceuticals, the patent-to-product ratio is close to 1 to 1, whereas in industries like semiconductors, products can read upon thousands of patents.

Professor Lemley then turned to the implications of these features of the patent system for innovation, competition and antitrust policy. He said that it was likely that attendees would hear from some industries (like life sciences) that patents are their lifeblood, and from other industries (like computers and software) that patents are useless. Professor Lemley cautioned that both statements could be true. Patent law is a generic body of law that is not designed to vary across industries (though the patent system has different effects on industries). Antitrust law, however, can and should take differences among industries (and differences in the role of patents across industries) into account.

Although Professor Lemley said that antitrust law and policy should maintain appropriate flexibility in antitrust issues involving intellectual property, he cautioned the enforcement agencies not to ignore the fact that patents are not guarantees for their owners. The agencies should not assume that patents are valid or infringed, or that they confer monopoly power. Professor Lemley explained that patents are issued through an ex parte process (as opposed to an adversarial process); that patent applicants have no duty to search for prior art; and that patent examiners usually take very little time in conducting their own analysis before issuing patents. Professor Lemley cited his own statistical research showing that 45 to 46 percent of litigated patents are found invalid. According to Professor Lemley, these numbers are too high for the agencies to accept "patent defenses" in antitrust investigations, where the parties contend that patent rights entitle them to restrict or eliminate competition that allegedly would not take place in the absence of a license or merger. Professor Lemley cautioned, however, that the enforcement agencies should not prohibit commercial conduct involving valid patents within the scope of patents. He specifically mentioned unilateral refusals to license.

Professor Lemley concluded his discussion by reiterating that patents are not a unitary phenomenon; enforcement agencies should focus on the actual characteristics of patents (and the patent system) in conjunction with facts about the industry at issue.

### **First Discussion Session**

Professor Kenneth Arrow opened the first discussion session by asking Professor Rubinfeld why strategic alliances, particularly R&D collaborations, are so pervasive, and whether some are used as cloaks for collusion. Professor Rubinfeld replied that many fields of research require cooperation, particularly with respect to standard-setting. Professor Rubinfeld added that core innovations should remain independent to reduce the risk of anticompetitive effects in some fields. Professor Gilbert commended that collusion would be difficult in the context of innovation and R&D because of the difficulty of detecting deviations from allegedly collusive agreements. If cheating occurred and was detected, it would be difficult for other members of an innovation cartel to catch up, reducing the ex ante incentive to collude at the outset. According to Professor Gilbert, antitrust law and policy must recognize the need for restraints in the context of R&D collaborations, particularly with respect to non-compete covenants limited to the scope of the joint R&D effort.

Professor Arrow asked Professor Shelanski to discuss Schumpeter's theories in more detail -- specifically, whether Schumpeter emphasized the prospect of monopoly as a spur to innovation or, instead, the ability of monopolists to engage in more R&D than non-monopolists. Professor Shelanski responded that Schumpeter discussed both, and emphasized the virtue of having large firms (perhaps not monopolists) sustaining independent paths of innovation. Professor Arrow replied that Schumpeter expressed some concern about the ability and incentive of "trustified bureaucracies" to engage in innovation; Schumpeter did not, according to Professor Arrow, assume that leapfrog innovations would occur. Professor Gilbert observed that Schumpeter seemed more interested in absolute firm size than in concentration as explanations for higher levels of R&D. Professor Hal Varian reminded attendees that Schumpeter's ultimate prediction was the replacement of capitalist enterprises with socialism. Professor Varian also discussed the importance of competition to obtain monopolies, and the benefits that leapfrogging innovation may produce within the context of the Schumpeterian model.

Susan DeSanti from the FTC asked Professor Rubinfeld to discuss the role of diversity (and diverse paths) in innovation. Professor Rubinfeld replied that the source and process of innovation are often unpredictable. In addition to economic incentives, there are psychological factors explaining why some firms innovate and others do not, and why some firms succeed where others fail. Professor Rubinfeld added that the agencies have sufficient competence to address innovation and competition in merger investigations, citing defense mergers as a primary example. He also noted that the agencies should not be discouraged from investigating transactions where patent issues may be significant. Professor Rubinfeld suggested that the agencies should not presume the validity or infringement of patents; instead, they should investigate the issue themselves. If they do not have sufficient in-house expertise to address the issues, they should hire outside consultants to provide input.

Sue Majewski from the Antitrust Division asked what sort of assumptions the agencies should use in investigating innovation and patent issues in merger cases. For example, if parties in a patent dispute attempt to resolve the dispute through merger, should the agencies assume that they would be able to settle their dispute through licenses that preserved or enhanced competition? Professor Lemley replied that the agencies cannot assume that a less restrictive license would occur in the absence of the merger. First, transaction costs may be prohibitively high. Second, strategic and/or irrational behavior may prevent otherwise efficient licensing from occurring. Third, pioneer patentholders and follow-on improvers often have divergent views about the value of improvements; improvers are often unable to internalize positive externalities generated by their innovations. Fourth, pioneer patentholders often cannot identify ex ante the firms most likely to generate the most valuable improvements. All of these factors, according to Professor Lemley, make it less likely that firms are likely to be able to negotiate efficient licensing terms; assuming that parties would do so in any given merger investigation would be unsound policy. Professor Ashish Arora agreed that the agencies cannot assume an efficient equilibrium for licensing transactions. But he noted that his own research -- focusing on research tools in the biotechnology field -- revealed that negotiations may have resulted in occasional delays, but did not result in a single case of breakdown. Professor Arora noted that some of the potential licensees may have been able to circumvent the intellectual property involved in the research tools (or offer a credible threat to do so).

Professor Gilbert said that licensing cannot be presumed to result in a more competitive outcome than integration. Licensing could require a number of restraints that would raise independent antitrust issues. Professor Gilbert cited research by David Mowery and Nathan Rosenberg suggesting that lax antitrust enforcement in the licensing field may have resulted in contractual arrangements that were less efficient and more anticompetitive than mergers.

Professor Varian expressed some skepticism about the inability of firms to reach efficient outcomes in licensing transactions. He pointed specifically to the semiconductor industry, where multiple firms hold thousands of patents incorporated into numerous products; although there have been episodes of hold-up and delay, the microprocessor industry has continued to evolve successfully and efficiently. Professor Varian also cited historical examples of where industries have evolved efficiently even in the presence of multiple patents owned by multiple firms; he noted that there were 100 patents incorporated into the incandescent light, 300 patents in the first telephones, and 1000 patents in the first sewing machines. Historical experience, according to Professor Varian, shows that these are not new issues, and that firms have found ways to resolve them in the past.

Susan DeSanti asked whether innovation would come from unpredictable sources where entry barriers are low. Professor Shelanski said this could only be resolved on a case-by-case basis. Fringe firms in some industries have been more significant innovators than in other industries. Professor Gilbert added that a key inquiry in the merger context is to determine the asset-specific investments that would be necessary for successful R&D. He cautioned against drawing inferences from a lack of R&D competition in relevant markets -- it does not necessarily mean that a new firm would be able to enter successfully without moving along a significant experience curve already negotiated by incumbents. Professor Rubinfeld said that entry barriers in defense industries can be significant, particularly when competition involves prime contractors

(or systems integrators). Although mergers eliminating primes may not have immediate anticompetitive effects, they can, according to Professor Rubinfeld, have longer-term effects on innovation and competition that cannot be undone once the merger has been consummated.

Ray Chen from the PTO asked whether there were any particular studies showing that patents had a deleterious impact on innovations in a particular industry. Professor Arora said that he has attempted to quantify the impact of patents on investments in R&D. According to his research, if one doubles the premium from patents, R&D would increase 33% and patenting R&D would increase 59%. Professor Arora noted, however, that there is a lot of variation across firms and across industries.

### **Professor Kenneth Arrow**

Professor Kenneth Arrow described the basic elements of a dynamic competition model.<sup>40</sup>

Professor Arrow's first element is that differing sources of R&D have "somewhat independent chances of achievement." Firms, for a variety of reasons, approach the process of innovation differently and enjoy varying degrees of success.

The second basic element in the dynamic competition model is that network effects and/or increasing returns in innovation or production limit the number of firms within the industry at any given moment. Entry and displacement occur through the process of innovation.

The third basic element in Professor Arrow's model is that a dominant firm in these markets can enjoy entry barriers deriving from an installed base or intellectual property rights. The IP rights can represent an actual or perceived entry barrier sufficient either to preclude entry or to deter innovation designed to facilitate entry. If the incumbent and follow-on innovators are unable to bargain, entry and follow-on innovation are less likely to occur.

The fourth basic characteristic of Professor Arrow's model is that firms attempt to enter by investing in R&D. The quality of innovation is a random variable. Unless the best new entrant's quality of innovation exceeds the aggregate entry barriers enjoyed by the incumbent, the incumbent retains the monopoly until the next challenge.

Professor Arrow then discussed some of the implications of his model. First, the probability that an incumbent will be displaced by new entry is "an increasing function of [the] number of entrants and decreasing function of entry barrier[s]." Second, these functions define "incentives to enter and incentive on [the incumbent] to engage in research." For example, although a large number of potential entrants increases the chance of displacing the incumbent, it may reduce the individual incentive of potential entrants to compete to become the next monopolist. But it may increase the incumbent's incentive to invest in R&D. Third, increased entry barriers (including patent protection) "decrease the direct returns to potential competition but increase the prospects of obtaining a subsequent temporary monopoly." According to

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<sup>40</sup> Professor Arrow's presentation may be found at [www.ftc.gov/opp/intellect/020225kennethjarrow.pdf](http://www.ftc.gov/opp/intellect/020225kennethjarrow.pdf).

Professor Arrow, "[t]here is at least the possibility that increased patent protection has the effect of increasing the effective length of a patent monopoly beyond the apparent limit set by law."

### **Professor Ashish Arora**

Professor Arora gave a presentation on "Patents, R&D and the Market for Technology."<sup>41</sup>

Professor Arora began with an overview of the "Knowledge Economy." According to Professor Arora, knowledge has been an essential feature of economic activity for quite some time. Recently, however, knowledge has acquired an independent identity as an economic commodity, embodied in emerging markets for technology. Intellectual property rights provide the institutional counterpart and foundation for knowledge "as a tradable economic commodity."

Professor Arora then discussed his research on technology markets, which focuses on determining the size, nature and location of technology markets. He began with a simple typology, distinguishing between horizontal licensing (such as Union Carbide's licensing Unipol polyethylene technology to BP) and vertical licensing (e.g., licensing of IP cores in semiconductors). According to Professor Arora, patents encouraged the development of technology markets, especially in chemical, biotechnology and semiconductor industries. Professor Arora estimates the size of the technology market at \$50 billion per year in royalty flows and \$20 to \$35 billion in licensing and R&D, together accounting for 10 to 15% of civilian R&D.

In the chemical industry, the emergence of technology markets has resulted in significant changes in the nature, sources, and location of production. After accounting for almost no global chemical exports from 1899 through 1959, countries outside of the U.S., Western Europe and Japan account for over 33% of global exports. Sources for new global exports include China, Korea, Taiwan and India. According to Professor Arora, 43% of the technology fueling these new global exports is coming from specialized engineering firms (which also account for 28% of technology utilized by chemical producers in the U.S., Western Europe and Japan, primarily smaller companies that resemble new competitors in the developing world).

According to Professor Arora, there are several important implications arising from his research on technology markets. First, small innovative companies (i.e., specialized engineering firms) can benefit from innovation even without owning significant downstream assets. Second, R&D-intensive companies can capture more value from innovation by licensing others. Third, technology users are able to avoid duplicative R&D and focus on downstream production. Markets for technology therefore encourage vertical specialization and reduce barriers to entry in downstream markets where upstream R&D can be developed and licensed by other firms. Professor Arora also suggested that patents can reduce transaction costs by facilitating the exchange of nonpatentable know-how and services.

Professor Arora identified four policy issues relating to intellectual property rights and technology markets. First, in industries such as biotechnology and semiconductors, the

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<sup>41</sup> Professor Arora's presentation may be found at <http://www.ftc.gov/opp/intellect/020225ashisharora.pdf>.

fragmentation of intellectual property rights and emergence of blocking patents could increase transaction costs. Second, increasing litigation costs may have a disproportionately harmful impact on smaller, innovative firms with less capital to defend their innovations or their production processes. Third, in some industries, such as software, there has been less than optimal disclosure in patents, which may reduce the value of patents as a disclosure mechanism to others in the field. Finally, patents and the market for technology may have an adverse impact on academic norms.

### **Professor Hal Varian**

Professor Hal Varian offered a presentation entitled "Intellectual Property, Competition and Innovation: Some Partially-Baked Ideas."<sup>42</sup>

Professor Varian began with a summary of the textbook analysis of monopoly, including its consequences, origins, and cures. Traditional microeconomics teaches that monopoly results in higher prices and lower output than competition produces. Monopoly results from government regulation, returns to scale or anticompetitive behavior. Traditional remedies include deregulation (where the source of monopoly is regulation), regulation (where the source may be returns to scale) or adjudication (where the source is anticompetitive behavior).

According to Professor Varian, the most fundamental flaw in the textbook analysis of monopoly is that firms often compete to obtain monopolies. They engage in patent races; offer competing proprietary standards; attempt to take advantage of network effects and consumer lock-in; and try to obtain supply-side economies of scale. When competition for the market is intense, firms may compete away their profits.

When competition is over, the deadweight loss resulting from monopoly power (the reduction in output occurring when the dominant firm's price exceeds its marginal cost) may still be present. But Professor Varian explained that even the textbook analysis of deadweight loss may be unsatisfactory in today's economy. Indeed, a price exceeding marginal cost might not reflect market power or result in inefficiency. When there are returns to scale, a flat price must be greater than marginal cost, even if a firm does not possess monopoly power. Price discrimination, increasingly common in high-technology industries, may be efficient and is often practiced by firms that do not have market power.

Professor Varian then explained the increasing frequency of price and quality discrimination. According to Professor Varian, improved monitoring technology enables firms to gain more information about individual consumer preferences and adjust the quality and price of their output in tailor-made transactions. Computer mediated transactions, purchase histories (like credit histories), and loyalty clubs all facilitate this process of price and quality discrimination. Over time, Professor Varian believes that licensing will increasingly replace sales for both tangible and intangible goods; price will increasingly depend on conditions of use. Firms will also be able to use price and quality discrimination to avoid head-to-head competition

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<sup>42</sup> Professor Varian's presentation may be found at <http://www.ftc.gov/opp/intellect/020225halvarian.pdf>.

in markets where there are returns to scale.

Professor Varian then offered what he labeled the "Third Theorem of Welfare Economics:" "If firms compete to become a price discriminating monopolist, then we get an efficient outcome." Although he acknowledged that this an "extreme case," Professor Varian pointed out that models of perfect competition and perfect monopoly are similarly extreme. In markets with increasing returns, lock-in and network effects, Professor Varian said that policymakers must take this model very seriously, looking at the entire history of affected markets and evaluating in detail the impact of price discrimination.

Professor Varian then suggested that this model may ignore some of the other social costs of monopoly. For example, monopoly may reduce quality below levels that would exist in a more competitive market (or, in cases like AT&T before its breakup, produce too much quality for too high a price). Monopoly may also result in less innovation, although monopolists may have more money to invest in R&D that produces innovation. Professor Varian also suggested that competition to acquire monopolies does not always benefit consumers -- firms may spend money on rent-seeking (versus activities to encourage consumers to buy their product or adopt their standard). Races to acquire monopolies may result in duplicative and preemptive efforts that do not enhance consumer welfare.

Professor Varian also said that it would be useful to ensure that antitrust policy continued to prevent socially detrimental conduct by monopolists designed to stifle competition. He noted that even firms that compete to obtain efficient monopolies may try to prevent socially beneficial entry or extend their monopolies in a manner that does not benefit consumers. Professor Varian suggested that antitrust policy should ensure that fair competition prevails in future challenges so that the best contender wins, not just incumbent monopolists.

Professor Varian concluded his presentation by emphasizing the need for a more detailed and systematic treatment of competitions to obtain monopolies. He added that the impact of modern monopolies on innovation, quality and future competitions remains a critical issue.

## **Second Discussion Session**

Susan DeSanti opened the second discussion session by asking how antitrust policy should incorporate timeframes into its analysis (i.e., short-run vs. long-run effects). Professor Arrow replied that competition for monopolies are a recurring event, even though conditions may change. He added that anything extending the gross inefficiencies resulting from monopoly power is socially detrimental. Professor Rubinfeld commented that the cost of enforcement may be lower than the social cost of nonenforcement in particular cases. If, for example, enforcers permit a merger to proceed that could reduce innovation, the loss of innovation and the merger itself may be irreversible.

Professor Varian discussed the importance of incentives to invent around incumbent technologies and the social value of such innovation. He contrasted the impact of Xerox's compulsory licensing of copying technology in the mid-1970s and its nonlicensing of printer technologies. Firms may have taken a different route in the printing world if they had been able

to obtain licenses to Xerox's printer technologies, but the result may have been less innovation and less value for consumers. Professor Varian said that the focus of antitrust policy vis-à-vis monopolists should be to prevent the extension of monopoly power through exclusionary leveraging and anticompetitive vertical mergers.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of Economic  
Perspectives on Intellectual Property,  
Competition and Innovation

February 26, 2002  
Morning Session

The Federal Trade Commission and Department of Justice continued their second day of hearings in Berkeley, California on the implications of antitrust and intellectual property law and policy. The focus continued to be economic perspectives on intellectual property, competition and innovation. Panelists included:

- **John H. Barton**, George E. Osborne Professor of Law, Stanford University Law School.
- **Bronwyn H. Hall**, Professor of Economics, University of California, Berkeley.
- **Robert P. Merges**, Wilson, Sonsini, Goodrich & Rosati Distinguished Professor of Law and Technology, and Director, Berkeley Center for Law and Technology, University of California, Berkeley.
- **Suzanne Anderson Scotchmer**, Professor of Economics and Public Policy, University of California, Berkeley.
- **Robert D. Stoner**, Vice-President, Economists, Inc.
- **David J. Teece**, Mitsubishi Bank Professor of International Business and Finance, University of California, Berkeley.

Below are summaries of their individual presentations and group discussions.

### **Opening Remarks**

William Kovacic, General Counsel of the FTC, opened the session with some remarks about the objective of the hearings. First, he observed that the "deliberately open texture" of antitrust law made it well-suited to adapt to economic change. Antitrust law and policy are ideally informed by continuing developments in the economy and economic theory. Institutional adaptation, however, may be more challenging. The hearings are designed to expand the knowledge base and competence of the institutions charged with the formulation of antitrust policy. Mr. Kovacic then turned the session over to FTC staffer Bill Cohen, who introduced the panelists and asked Dr. Bob Stoner to provide an overview of economic perspectives on intellectual property.

## **Dr. Robert D. Stoner**

Dr. Stoner gave a presentation on the current state of economic thinking on "Intellectual Property and Innovation."<sup>43</sup>

Dr. Stoner began with the four principal rationales that economists have offered for intellectual property rights. The most widely-accepted rationale among economists is to provide incentives to invent. Absent intellectual property rights, inventors might not be able to appropriate the value of their inventions and internalize the benefits as well as the costs. Trade secret law may be insufficient to protect inventions from early disclosure to potential rivals. One implicit assumption of this rationale is that invention is discrete, not cumulative. The cost of permitting full appropriability is restricting access to the invention (for a period of time) and the potential ability of patentholders to exercise monopoly power. Because patentholders enjoy full appropriability, intellectual property rights may lead to duplicative R&D and wasteful patent races. Economic literature on optimal scope and duration attempts to balance the costs and benefits of appropriability.

A second economic rationale for intellectual property rights is broader dissemination of innovations. Absent patents, firms would be forced to rely on trade secret law to prevent free riding, which would further restrict the disclosure of useful inventions. Licensing, by contrast, permits further dissemination of inventions without compromising the ability of the inventor to appropriate the positive externalities created by its invention. According to Dr. Stoner, this second rationale for intellectual property rights may be especially applicable to process innovations.

A third economic rationale for intellectual property rights is greater commercialization of inventions. Patents and other intellectual property rights may encourage exclusive licensing or entrepreneurial activity that may not occur in the absence of legal protection for inventions. This is especially true for smaller firms or inventors that are not fully integrated into downstream production. According to Dr. Stoner, this theory is relevant to the effectiveness and necessity of granting patent rights on inventions arising from government-financed research (permitted since the early 1980s under the Bayh-Dole Act). Patent rights are arguably unnecessary to encourage innovation when the government itself is financing the inventive activity. If inventors can patent subsequent research not financed by the government, Dr. Stoner said that the case for patenting the original research may be even weaker. Dr. Stoner added that Bayh-Dole would, however, encourage the growth of smaller firms that would not have sufficient resources to engage in larger-scale research in the absence of government funding.

A fourth economic rationale for intellectual property rights is the "prospect theory," in which patents assure appropriability of inventions with strong potential for follow-on innovation. Under this approach, broad patent rights for the initial inventions ensure a more efficient coordination of further follow-on innovations and reduces duplicative R&D. According to Dr. Stoner, broad patent rights may however, reduce follow-on innovation when the transaction costs

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<sup>43</sup> Dr. Stoner's presentation may be found at [www.ftc.gov/opp/intellect/020226robertdstoner.pdf](http://www.ftc.gov/opp/intellect/020226robertdstoner.pdf).

of licensing are high and if the threat of infringement dampens the incentive to engage in follow-on innovation.

Dr. Stoner then turned to the economic literature on optimal patents, which focuses on the tradeoff between incentives to innovate "and static efficiency loss associated with monopoly grant[]." More recent literature focuses upon the breadth and length of patent rights to minimize welfare losses associated with a specific incentive to innovate. Professors Richard Gilbert and Carl Shapiro conclude that long-lived patents of narrow breadth are likely to be optimal in a homogeneous product model; Professor Paul Klemperer concludes that either broad or narrow patents could be optimal in a differentiated product context depending on the characteristics of substitution.

Dr. Stoner then discussed economic literature on patent races, which focuses on the potential inefficiencies arising from the strategic interaction of multiple firms investing in the race to obtain intellectual property rights. According to Dr. Stoner, the economic literature concludes that broad patent protection may lead to over-investment in R&D activity; broader, shorter-lived patents may be optimal in situations where a race is likely.

Dr. Stoner then discussed the economic debate over optimal patent length and breadth in the context of cumulative innovation. According to Dr. Stoner, recent work by Professor Suzanne Scotchmer and others confirms earlier theoretical work by Professor Edmund Kitch suggesting that broad patent rights for pioneering inventors may be the most efficient means of achieving optimal levels of investment in innovation. Broad patent rights for pioneers can eliminate duplicative investments in R&D and reduce the transaction costs necessary to ensure that other firms adequately invest in follow-on innovations. According to Dr. Stoner, these results (and assumptions) depend on a known trajectory of innovation and a strong *ex ante* incentive to license. If and when licensing negotiations fail, broad patents could reduce investment by other firms in follow-on innovations. In a recent article, Professors Hopenhayn and Mitchell suggest that a menu of variable patent breadths for different innovations in different contexts may be superior to patent law's traditional one-size-fits-all model.

Professor Stoner concluded by surveying economic literature on the actual effect of patents on competition and innovation. Most empirical work has focused on whether and how much intellectual property protection is necessary to provide adequate incentives to innovate. Studies by Professors Richard Levin, Wesley Cohen and others suggest that patents are an important incentive to innovate in only a few industries, such as pharmaceuticals. Recent studies find little evidence that changes in the scope of patents increased R&D or patent output in the United States or Japan; in the semiconductor industry, Professors Hall and Ziedonis found no evidence that greater patent scope in the U.S. is driving innovation. Earlier work by Professors Merges and Nelson focusing on the historical evolution of some industries suggests that strong patent rights inhibited broader development of pioneering technologies.

**Dr. Suzanne A. Scotchmer**

Professor Scotchmer gave a presentation on "Competition Policy and Innovation: The Context of Cumulative Innovation."<sup>44</sup>

Professor Scotchmer said that the principal issue underlying the hearings are the proper and respective domains of intellectual property and competition policy. The 1995 Antitrust Guidelines for the Licensing of Intellectual Property (the "IP Guidelines") articulated a clear division between the fields. According to Professor Scotchmer, there is no mandate for competition policy to take incentives into account. Instead, the Guidelines focus on preventing the unlawful acquisition or maintenance of market power. Professor Scotchmer asked why the flexibility and case-by-case nature of competition policy should not be used more proactively.

Professor Scotchmer then discussed the question of cumulative innovation. There are, according to Professor Scotchmer, two policy objectives at stake. One is an efficient division of profits between initial and follow-on innovators to ensure optimal levels of innovation from one generation to the next; the other, consistent with Edmund Kitch's model, is to ensure optimal levels of initial research by pioneers. Both lead to the conclusion that licensing is better than no licensing. Kitch's model has especially important implications for antitrust policy involving licensing issues; more restrictions on the ability to license may undermine some of the efficiencies created by a "prospecting" system.

Professor Scotchmer then discussed why narrow patents could threaten sound competition and intellectual property policy. First, if narrow patents permit competition with initial innovators, other firms would have "[n]o incentive" to invest in follow-on innovation. Second, if other firms do not have the incentive to invest in follow-on innovations, the pioneer will have fewer incentives to invest *ex ante* because it cannot profit from follow-on innovation. To mitigate this erosion of incentives to innovate, Professor Scotchmer believes that antitrust policy should encourage licensing and even mergers despite a lack of infringement between the parties to the transaction. According to Professor Scotchmer, this is not consistent with current antitrust practice. Professor Scotchmer also said that narrower patents are shorter-lived than broader patents, citing research showing that many patents are not renewed in Germany and France, and that only approximately 15% of R&D costs are covered by patenting.

Professor Scotchmer then discussed why broader patents could threaten sound competition and intellectual property policy. If *ex ante* licensing does not occur, broad patents can stifle follow-on innovation, which, in turn, could reduce the *ex ante* incentive to invest in pioneer innovations. Once again, competition policy could mitigate these disincentives by encouraging mergers and licensing in the context of broad patents, which, according to Professor Scotchmer, is consistent with current antitrust policy.

Professor Scotchmer also examined how "Kitch prospecting" could pose additional dangers to competition and intellectual property policy. Under the Kitch approach, pioneer patentholders have the ability and incentive to coordinate follow-on R&D efficiently with other firms. But private efficiency is not necessarily synonymous with social efficiency. For example,

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<sup>44</sup> Professor Scotchmer's presentation may be found at [www.ftc.gov/opp/intellect/020226suzanneandersonscotchmer.pdf](http://www.ftc.gov/opp/intellect/020226suzanneandersonscotchmer.pdf).

if a firm secures a broad patent on a gene sequence coding for a specific disease, the patent and follow-on licensing can eliminate duplicative R&D that would occur in their absence. But if patents on therapies could be mutually non-infringing, an exclusive license could ensure a monopoly in therapeutic markets. Licensing by pioneers may therefore reduce progress by avoiding patent races for follow-on innovations, and may eliminate competition in the market for follow-on products.

Professor Scotchmer concluded by emphasizing the potential role that antitrust policy can play in eliminating disincentives to innovate. According to Professor Scotchmer, the IP Guidelines could articulate a more proactive role for the enforcement agencies. Although it is difficult for the agencies to mitigate problems created by narrow patents, the agencies are in a position to mitigate problems associated with overbroad patents.

### **John H. Barton**

Professor John Barton gave a presentation on "Patents and Antitrust: Emerging Paradigms."<sup>45</sup> Professor Barton focused on three paradigms: (1) the scope of intellectual property rights and exclusion; (2) leveraging in the context of network externalities; and (3) the behavior of cross-infringing oligopolists.

The first paradigm -- the scope of intellectual property rights -- focuses on the optimum strength of intellectual property necessary to encourage innovation without discouraging follow-on innovation. Professor Barton cited the example of a utility patent restricting the use of a particular seed for breeding. One patent claim could cover the plant or crop affected by the invention. A second claim could cover the use of a seed for breeding. A variety of restrictions arising from patent law or through contract could prevent others from crossing patented seeds with their own materials (or from reverse engineering the material). According to Professor Barton, a key question is whether initial innovators should be prevented from imposing restrictions that go beyond the scope of patent or trade secret law to prevent others from using (or reverse engineering their inventions). Other examples include patents on ESTs or biotechnology research tools; patents on diagnostic sequences; or reach-through rights in licenses (in which a patentholder can earn royalties from sales of its licensees' downstream products developed in part with the patentholder's invention).

Professor Barton then turned to the second paradigm -- leveraging with network externalities. Here, the key issue is how much should owners of intellectual property be permitted to use their market power to enter separate markets, especially markets characterized by network externalities. Examples include Microsoft's entry into the browser market, the tying of patent video game consoles to the use of designated game cartridges; and the use of rights in an automobile computer program to control access to repair or replacement part markets. Here, network externalities may create additional barriers to entry preventing firms from competing with an upstream monopolist on a level playing field in adjacent markets.

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<sup>45</sup> Professor Barton's presentation may be found at [www.ftc.gov/opp/intellect/020226johnhbarton.pdf](http://www.ftc.gov/opp/intellect/020226johnhbarton.pdf).

Professor Barton then turned to his final paradigm -- cross-infringing oligopolists.<sup>46</sup> According to Professor Barton, the key question here is the extent to which oligopolists in a patent-intensive environment should be entitled to engage in selective licensing strategies. Examples could include the use of patents to exclude potential entrants in the semiconductor or financial services industries, or industry-wide collaborations to obtain royalties from other firms to use industry standards, as with the DVD standard in consumer electronics. In some of these industries, factors other than patents (such as short product cycles, first-mover advantages, installed base, and lock-in) force firms to compete intensely. But patents can be used to exclude other firms that would like to compete along other dimensions of rivalry.

Professor Barton concluded by suggesting that antitrust law's rule of reason inquiry is the most appropriate analytical framework for resolving the issues raised under his three paradigms.

### **Robert P. Merges**

Professor Robert Merges gave a presentation on "Second Order Patent Scope."<sup>47</sup> He said that his objective is to introduce economic issues relating to intellectual property outside the familiar debate over initial and follow-on innovations.

Professor Merges began with a summary of current economic literature on patent scope, which focuses largely on issues of enablement and infringement (especially under the doctrine of equivalents). Enablement -- one of the requirements for patentability -- requires patent applicants to describe their inventions in a manner that enables others with ordinary skill in the art to make and use the invention. Here, the key economic question is how many options should a pioneer patent applicant be able to obtain on future innovations through a vague description of the invention. For example, should a patentholder on an Express Sequence Tag (or EST) receive a patent on the gene embodied by the EST even when the patentholder does not know what purposes or therapeutic objectives the EST or gene might serve? The key economic question under the doctrine of equivalents is how many commercialized improvements should be deemed to infringe inventions they do not literally infringe.

Professor Merges then turned to other doctrines affecting patent scope. He first examined the "written description" requirement in patent law, which applies frequently when patentees amend claims in pending applications to cover new products introduced by competitors. Such reapplications attempt to expand the scope of claims during the pendency of patent applications. Federal Circuit law limits the ability of patentholders to claim that amendments adequately described the full scope of the invention even if the original application may have enabled others in the field to make and use the full scope of the invention. Professor Merges also discussed written description requirements and the notion of "leading breadth," which focuses on how much detail pioneer patent applicants must include when they may be unaware of the full implications and uses of their initial innovation. Broader patents arguably encourage potential

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<sup>46</sup> Professor Barton recently discussed this paradigm in more detail in *Antitrust Treatment of Oligopolies with Mutually Blocking Patent Portfolios*, 69 *Antitrust L.J.* 851 (2002).

<sup>47</sup> Professor Merges' presentation may be found at [www.ftc.gov/opp/intellect/020226robertpmerges.pdf](http://www.ftc.gov/opp/intellect/020226robertpmerges.pdf).

patentholders to invest more heavily in innovation *ex ante*; narrower patents may encourage other firms to invest in follow-on innovations.

Professor Merges then examined "portfolio-level scope issues." First, he discussed team research and prior art. According to Professor Merges, the current rules on team research favor large corporate pioneers by holding that inventions conceived and applications filed by other corporate employees do not count as prior art that may be cited against other team members (which could undermine the patentability of these subsequent inventions). Professor Merges believes that this facilitates the ability of larger corporations (or larger research departments) to build pioneer portfolios relative to smaller firms or smaller research departments. Professor Merges also noted that the debate over first- and next-generation innovation incentives probably focuses on the wrong unit of analysis by looking at individual patents. The more accurate unit of analysis is patent portfolios.

Professor Merges then discussed the issue of double patenting. Current patent law permits pioneers to claim obvious variants of their inventions in one or more related applications. According to Professor Merges, this exception to the double patenting doctrine creates a subtle bias in favor of pioneer patentholders over follow-on innovators in the race to patent follow-on innovations. Although patent law precludes even pioneers from gaining extensions in patent duration for these obvious variants on the original claims, current economic literature suggests that expansions in scope may be far more economically significant than extensions in duration in expanding market power arising from intellectual property. Professor Merges cited the decision in *Quad Env'tl Techs. Corp. v. Union Sanitary Dist.*<sup>48</sup> as evidence that the courts are aware of the subtle favoritism in favor of pioneers in developing follow-on innovations. According to the Federal Circuit, "[v]oluntary limitation of the later issued patent is a convenient response to an obvious-type double patenting rejection, when the requirement of common ownership is met. Any possible enlargement of the term of exclusivity is eliminated, while enabling some limited protection to a patentee's later developments."<sup>49</sup>

Professor Merges concluded by noting where some of the more significant developments could arise. First, he emphasized the importance of watching legislative developments in Congress. Second, he said that the Supreme Court's decision in *Eldred v. Reno* (addressing the constitutionality of legislation extending copyright terms) could result in constitutional restraints on rent-seeking. According to Professor Merges, the Supreme Court's more active involvement in intellectual property issues could be a significant trend that should be watched carefully and guided in the proper direction.

### **First Discussion Session**

FTC staffer Bill Cohen opened the first discussion session by noting three economic paradigms for intellectual property protection and innovation: (1) vesting rights in pioneer patentholders (and preventing follow-on innovators from patenting); (2) limiting IP protection

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<sup>48</sup> 946 F.2d 870 (Fed. Cir. 1991).

<sup>49</sup> *Id.* at 873.

for pioneers; and (3) giving pioneer and follow-on inventors IP rights and encouraging them to engage in *ex post* licensing.

Professor Scotchmer said that the real question is what kind of consumer welfare should be encouraged by patent and antitrust law. Innovation is a component of welfare; lower prices through competition is another component of consumer welfare. That, according to Professor Scotchmer, gives rise to the tension between antitrust law and intellectual property rights. Preventing mergers and licensing among pioneer and follow-on innovators reduces a portion of consumer welfare by reducing their incentives to engage in innovation. Incentives to innovate are especially adversely affected when innovators offer close substitutes that compete on price; narrower patents generally mean closer competition between patentholders, which, in turn, mean lower prices and lower profits. According to Professor Scotchmer, antitrust law should attempt to remedy these disincentives to innovate by permitting transactions among patentholders even (and perhaps especially) when the narrowness of their patents force them into levels of competition that are not optimal for innovation.

Professor Merges noted that some patentholders, such as universities, do not have the same strictly profit-maximizing incentives of other commercial firms that own patents. They may have the incentive to license more widely; broader licensing may create greater competition. Perhaps one of the most interesting but unexamined aspect of the patent system is why some IP owners do not enforce their rights.

Professor David Teece addressed Mr. Cohen's third paradigm, in which firms cross-license each other. He noted that firms usually not only cross-license each other, but provide payments recognizing the respective strength of their IP portfolios (and the commercial significance of fundamental patents). Extracting fees in the form of royalties enables incumbents to prevent free-rider problems arising from later entrants that incurred little or no R&D costs. This system of cross-licensing, balancing payments and royalties does not, according to Professor Teece, hinder innovation in the semiconductor or microprocessor industries.

Professor Barton replied that recent research in the semiconductor industry suggests that most firms build portfolios only to avoid lawsuits. Intellectual property is not necessary to innovate. The risk of litigation arises from smaller firms challenging larger firms. Professor Bronwyn Hall added that her research in the semiconductor industry shows that the system works but results in a lot of wasted resources. IP portfolios are not necessary to innovate but are necessary to avoid the threat of costly preliminary injunctions. IP protection may also be a necessary evil for smaller firms requiring venture capital financing.

### **Dr. Bronwyn H. Hall**

Professor Bronwyn Hall gave a presentation on "Patents and Innovation."<sup>50</sup>

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<sup>50</sup> Professor Hall's presentation may be found at [www.ftc.gov/opp/intellect/020226bronwynhhall.pdf](http://www.ftc.gov/opp/intellect/020226bronwynhhall.pdf). Her testimony may be found at [www.ftc.gov/opp/intellect/020226bronwynhhalltext.pdf](http://www.ftc.gov/opp/intellect/020226bronwynhhalltext.pdf).

According to Professor Hall, patents are viewed by economists as a "necessary evil" in which society is willing to reward short-term monopolies in exchange for encouraging firms to innovate and disclose their innovations to the public. Professor Hall echoed the sentiments of Edith Penrose, who said in 1951 that although it would be difficult for an economist to justify the patent system currently in existence, it would be harder to make a case for removing or limiting the system. Patents increase the incentive for R&D investments and can enable smaller firms to enter markets, but they can impede the combination of new ideas and inventors, raise transaction costs, and create short-term monopolies and perhaps even long-term monopolies in network industries.

Professor Hall then examined the economic literature on whether patent systems increase innovation. A recent study by Petra Moser using data from the 19<sup>th</sup> century suggests that changes in the patent system did not increase innovation, but altered the focus of investments in innovation. Another recent historical study by Professor Josh Lerner focusing on the patent system in Great Britain suggests that the patent system did not increase in innovation but did increase patenting by foreign firms. Greater variations between patent systems in the 19<sup>th</sup> century make it ripe for comparative economic studies.

Studies of 20<sup>th</sup> century innovation offer more mixed results. Some studies show greater IP rights led to more innovation in developed countries (especially in the pharmaceutical industry); another study showed that greater patent scope in Japan did not increase R&D expenditures; a study from Canada suggested that innovation causes patenting, but patenting did not seem to increase innovation; a study of the software industry showed that strong patent rights were not necessary to produce innovations; and Professor Ashish Arora's research suggests that increasing the premiums resulting from patents does not increase R&D except in pharmaceutical and biotechnology industries. Professor Hall's own study of the semiconductor industry (in collaboration with Professor Rosemarie Ziedonis) shows that the creation of the Federal Circuit caused greater patenting in the semiconductor industry, but largely because of fears about litigation and the need for bulkier patent portfolios when negotiating cross-licenses.

Professor Hall offered four specific conclusions based on her survey of the economic literature: (1) stronger patent systems increase patenting and strategic behavior involving patents; (2) stronger patent protection may not increase innovation but can affect the focus of R&D investments by shifting them to things that are patentable; (3) if increases in innovation resulting from greater patent protection have occurred, they are likely to have taken place in the pharmaceutical and biotechnology fields, and perhaps in specialty chemicals; and (4) intellectual property rights facilitate vertical disintegration of some industries by encouraging the growth of technology markets and licensing; new firms may be able to participate in markets possessing only intangible assets.

### **Dr. David J. Teece**

Professor David Teece gave his presentation on "Intellectual Property, Valuation and Licensing."<sup>51</sup>

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<sup>51</sup> Professor Teece's presentation may be found at [www.ftc.gov/opp/intellect/020226davidjteece.pdf](http://www.ftc.gov/opp/intellect/020226davidjteece.pdf).

Professor Teece offered some opening remarks and observations about the hearings. First, he applauded the enforcement agencies for addressing very difficult questions through the hearings. He said that we cannot pretend that "static" approaches to competition policy in this context are likely to be effective. The agencies must be able to provide some guidance to industry in this area with clarity and predictability. Professor Teece noted that he was struck by Professor Rubinfeld's remarks on the previous day about the cost of enforcement agencies permitting anticompetitive transactions and the benefits of prohibiting anticompetitive transactions in the context of innovation. Professor Teece did not think this was an area of antitrust policy where economic theory or studies justified any hubris arising from vigorous antitrust enforcement.

Professor Teece then turned to some of the issues that previous panelists had addressed. He began with Professor Howard Shelanski's testimony about the relationship between market share, firm size and incentives to innovate. According to Professor Teece, the relationship between market share, firm size and innovation was too complex to afford any easy conclusions; many firm-specific factors beyond size are critical in understanding the level and nature of innovative activity. Moreover, the flood of money available to start-ups from the venture capital community undermined the traditional Schumpeterian model that envisaged higher investments from larger firms due to larger and more stable cash flows. The level of explanatory power offered by traditional antitrust metrics will never be high in the context of innovation and high-technology industries. Professor Teece noted, however, that important economic concepts like complementarity, competences and competition for monopoly had made it into the antitrust lexicon. According to Professor Teece, the structuralist framework underlying traditional antitrust policy should be cast aside.

Professor Teece then turned to specific remarks about patents, licensing and innovation. First, he suggested that patents are a determinant of innovation, especially important for appropriability in industries like medical equipment and pharmaceuticals. He also said that a recent study led Professor Wesley Cohen and others shows that patents have become an increasingly important device for capturing value from R&D investments. Professor Teece cited the example of smaller firms specializing in invention, such as Rambus, which focus exclusively on developing and licensing patent portfolios.

Professor Teece pointed to five factors determining the commercial strength of patent protection: (1) length of protection; (2) breadth of protection (*e.g.*, range of products covered); (3) likelihood of being upheld if challenged; (4) strength of exclusionary power, including the ability to refuse licenses under antitrust law; and (5) available remedies for infringement.

Professor Teece then examined the "fuzzy nature" of intellectual property rights. According to Professor Teece, it is unclear how intellectual property claims will be interpreted in practice. Inadvertent infringement can occur. The unclear boundaries of the grant can reduce the efficiency of negotiating licensing agreements between the patentholder and potential infringer; each often disagrees about the value of the IP rights at stake. As a consequence, the value of intellectual property rights may be systematically discounted in the marketplace. Most patent disputes arise only when firms disagree over the scope or validity of the patents.

Ambiguous property rights make the marketplace less likely to work efficiently. Open-ended or ambiguous antitrust policy can further reduce the value of intellectual property rights by decreasing the range of riskless commercial alternatives open to patentholders in negotiating licensing agreements.

Professor Teece also discussed the complementary nature of intellectual property rights and the "[f]allacy of 'One Patent, One Product' thinking." The focus of economic analysis should be on patent portfolios, not on individual patents. According to Professor Teece, all innovators stand on the shoulders of another innovators; the process is more complicated than the traditional model of pioneer patentholders and follow-on innovators. There are, however, important economic distinctions that should be drawn between complex and discrete technologies, as well as between systemic and autonomous innovations. Complex and systemic technologies are usually comprised of numerous patentable elements; discrete and autonomous technologies may consist of only one patentable element.

In fields consisting of complex technologies and systemic innovations, Professor Teece believes that bulk licensing and cross-licensing are commercially essential (and should therefore be encouraged by less restrictive antitrust policy). According to Professor Teece, requiring licensing to occur on a patent-by-patent basis would dramatically increase transaction costs and could reduce the incentive to license. Licensing in these contexts permits commercial participants to achieve design freedom and freedom to operate, which enhances competition. When antitrust policy has remained on the sidelines, firms have determined how to resolve problems arising from multiple patents owned by multiple firms. Over time, market participants develop norms that even more efficiently avoid patent conflicts, as in the semiconductor industry. Strict antitrust prohibitions which regulate the nature of royalty agreements only increase transaction costs and reduce the efficiency of industry-created norms.

## **Second Discussion Session**

FTC staffer Bill Cohen began the second discussion panel by asking whether smaller firms benefit the most from the patent system. Professor Teece replied that smaller firms owning only IP assets may possess even more significant power than vertically integrated firms competing in affected product markets; they have incentives to enforce their patents without being susceptible to patent infringement counterclaims. Professor Barton noted, however, that small firms have fewer resources for protracted patent litigation.

Professor Scotchmer raised the distinction between complementary and competitive IP rights. Although almost all IP rights may appear to be complementary, it can also be competitive in some contexts. Professor Scotchmer suggested that antitrust policy must come to grips with transactions involving complementary IP that could become competitive. Professor Kovacic asked how enforcers should attempt to determine whether a producer of complementary goods or IP is the most likely competitor of a pioneer patentholder. Are there any easy rules of thumb, or do these determinations require a deep knowledge of the markets at issue? Professor Scotchmer replied that such analysis always requires detailed knowledge of the relevant markets.

Mr. Cohen asked whether patent law should, like copyright law, have a fair use defense for literal infringements involving only basic research. Professor Hall expressed some sympathy for the idea, but said that it would be difficult to implement. For example, would the fair use exception also require the research to license back any commercially feasible innovations arising from basic research? Professor Teece opined that a fair use exception would increase additional uncertainty involving IP rights, which, in turn, would reduce their value and potentially reduce investments in the initial innovation. Professor Barton replied that dozens of firms invested in identifying ESTs despite uncertainty about their patentability. But he also noted that some inventions -- designed to carry out research itself -- would be adversely affected by a fair use exception for basic research.

Mr. Cohen asked Professor Barton where the patent system should change. Professor Barton replied that there should be some exemptions for basic research, that utility doctrine should be interpreted more strongly, and that nonobviousness requirements should be heightened. He also noted that different antitrust rules should apply to intellectual property practices in different industries depending on the importance of the patent system in encouraging innovation.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of Business  
Perspectives on Patents: Biotech and Pharmaceuticals

February 26, 2002  
Afternoon Session

The Federal Trade Commission and Department of Justice continued their second day of hearings in Berkeley, California on the implications of competition and intellectual property law and policy by focusing on perspectives on patents from biotechnology and pharmaceutical firms. Panelists included:

- **David W. Beier**, Partner, Hogan & Hartson, Counsel to Biotechnology Industry Organization.
- **Lee Bendekgey**, General Counsel and Executive Vice President, Incyte Genomics.
- **Robert Blackburn**, Vice President, Chief Patent Counsel, Chiron Corporation.
- **David J. Earp**, Vice President, Intellectual Property, Geron Corporation.
- **Michael K. Kirschner**, Vice President, Intellectual Property, Immunex Corporation.
- **Ross Oehler**, Vice President, U.S. Patent Operations, Aventis Pharmaceuticals Inc.

Below is a summary of the group's discussion.

### **Opening Remarks and Introductions**

FTC staffer Michael Wroblewski opened the session by asking participants to identify themselves and describe their companies.

David Beier from Hogan & Hartson said that he was representing the Biotechnology Industry Organization, which consists of over 1000 members (including companies and universities). Members have introduced 117 products for use in the United States. Mr. Beier was Chief Domestic Policy Adviser to Vice-President Al Gore before returning to private practice in 2001.

Lee Bendekgey from Incyte Genomics noted that Incyte possesses one of the largest IP portfolios in the pharmaceutical and biotechnology industries. Incyte focuses on the discovery and characterization of genes and antibodies, licensing its discoveries generally on a

nonexclusive basis for the development of therapies and diagnostics. Incyte became a prolific patent applicant after deciding that it would be more commercially successful than reselling information already in the public domain. Incyte has recently decided to use some of its knowledge base to produce its own therapeutics and diagnostics. Mr. Bendekgey said that although technological innovation inevitably sparks cries for patent law reform, the patent system accommodates change and innovation quite well in the biotechnology field. [He also noted that Incyte is both a plaintiff and defendant in patent disputes.] Policymakers should avoid the temptation to create industry-specific rules. Mr. Bendekgey believes the key issue for the patent system is increasing the quality of examination, whether the applicant is seeking business method or biotechnology patents. More funding is necessary to attract higher-quality examiners and reduce the workload of individual examiners. He also said that it might be useful to consider whether the U.S. patent system should adopt some elements from the European Opposition process for firms to challenge patent applications before they are issued.

Robert Blackburn, Chief Intellectual Property Counsel for Chiron, offered some basic information about his company. He noted that Chiron is a combination of three distinct lines of business -- a biopharmaceutical group (focusing on cancer treatments and antibiotics, a vaccines business, and a diagnostics division (focusing on blood screening). Over 25% of Chiron's revenues derive from licensing its intellectual property portfolio to others.

David J. Earp from Geron then offered some information about Geron's intellectual property portfolio and commercial operations. Based in Edinburgh, Geron is best known for controlling intellectual property relating to Dolly (the sheep clone), human stem cell research, and telomerase inhibitors (which make cancer cells mortal). Geron is investigating applications for Parkinson's disease, congestive heart failure, diabetes, and cancer. It currently has no product sales, relying on licensing for its revenues. It is both a licensor and licensee. Mr. Earp said that he had some questions about the scope of patentable subject matter in the U.S. (which is generally broader than elsewhere); he added that foreign jurisdictions could provide some useful ideas for the U.S. patent system to deal with bad patents.

Michael Kirschner discussed Immunex, one of the first biotechnology companies, founded the year after the Supreme Court's landmark decision in *Diamond v. Chakrabarty*.<sup>52</sup> Immunex's first product, Leukine, was introduced ten years later. Immunex subsequently introduced Enbrel, a biotechnology product targeted at rheumatic and psoriatic arthritis. Immunex was known throughout the pharmaceutical and biotechnology industry as Immunex University because of the willingness and freedom of Immunex researchers to share research and publish papers. According to Mr. Kirschner, the biotechnology industry is more complex, uncertain and research-intensive than the pharmaceutical industry. Whereas pharmaceutical companies almost uniformly love patents and the patent system, biotechnology firms have mixed feelings about them. Although most biotechnology firms would not exist without patent rights, they are especially vulnerable to the tragedy of the anti-commons, where multiple owners of small parcels of intellectual property rights can stifle the efficient development of biotechnological therapies. To offer Enbrel, for example, Immunex must pay royalties to six

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<sup>52</sup> 447 U.S. 303 (1980) (holding that laboratory-created micro-organisms could be patentable subject matter).

other companies. Royalty-stacking is pervasive and can result in prohibitively high costs for firms hoping to develop therapies for the marketplace.

Mr. Kirschner also noted that patents are often issued either to the wrong party or to multiple parties for the same invention. According to Mr. Kirschner, the PTO's examination process is in crisis; examiners are not even taking the time to read what they are sending to us. Examiners themselves are allegedly frustrated over their increasing inability to conduct more detailed and accurate examinations. Although it usually takes approximately 40 hours to draft an application, examinations in the biotechnology field average less than 25 hours. Although higher workloads on examiners can result in protracted pendencies for applications that merit approval, the more significant concern is that patent quality is declining precipitously in the biotechnology field. The PTO should double the time used to examine biotechnology patents and increase training of biotechnology examiners. In addition, policymakers should consider adopting a vigorous opposition system, where interested third parties could challenge the issuance of patents. Increases in patent quality, as well as an opposition system, would reduce the likelihood and risk of litigation.

Ross Oehler noted that Aventis was both a pharmaceutical and biotechnology company, offering a broad range of over-the-counter and prescription therapeutics. Like pure biotechnology companies, Aventis faces many of the same vexing patent issues that other companies confront, especially in its capacity as a licensee.

### **Discussion Session**

Mr. Wroblewski opened the discussion session by asking whether and how the creation of biotechnology products differs from the development of pharmaceutical products.

Mr. Beier replied that there are no fundamental differences. For both industries, the average cost of identifying and developing effective therapies is astronomical; the latest studies suggest that the average cost of an FDA-approved therapeutic agent is \$802 million (including the cost of failed or ineffective agents). The high risk of R&D (especially the high risk of failure) distinguishes biotechnology and pharmaceutical fields from the semiconductor industry, where innovation occurs at a steady and largely successful rate.

Mr. Blackburn agreed that distinctions between pharmaceutical and biotechnology industries were not that useful. Chiron does both. The customary distinction is between small molecules (usually identified by the pharmaceutical industry) and large molecules (usually developed by the biotechnology companies). The industries, however, are converging. Biotechnology research tools are now being used to identify small molecules that could become pharmaceuticals. Convergence is also occurring at the corporate level; small biotechnology start-ups account for increasingly more R&D in the pharmaceutical industry, licensing agents to branded pharmaceutical houses for development, clinical trials and commercialization. Mr. Earp agreed, noting that larger biotechnology firms like Genentech, Amgen and Chiron had, after successful product introductions, achieved the size and stature of some larger firms in the pharmaceutical industry.

Although Mr. Kirschner agreed that convergence was occurring, he said that biotechnology firms remain more vulnerable to third-party patents than pharmaceutical firms. Mr. Oehler, however, said that small molecules can be equally susceptible to patent challenges; developments and patent applications from biotechnology firms are very difficult to follow. He acknowledged that many large pharmaceutical companies increasingly aspire to resemble smaller biotechnology companies and smaller biotechnology companies increasingly want to resemble larger pharmaceutical companies. Mr. Oehler also agreed that the astronomical costs of new product development make co-promotion and co-marketing a more desirable and efficient means to share the risks of product development, even among larger pharmaceutical firms with greater resources than smaller start-ups.

Mr. Wroblewski then asked whether innovation in biotechnology and pharmaceutical industries was coming from larger or smaller firms. Mr. Bendekgey replied that innovations were coming from diverse sources. Biotechnology companies spent an extraordinary portion of their resources on R&D, perhaps as much as 45 to 50%. Patentability plays an important role in capital formation for smaller start-ups. Patents also enhance innovation by promoting disclosure. Mr. Bendekgey noted that in the early 1990s, when the patentability of genetic information was uncertain, firms like Incyte shared their information only through trade secret agreements. Incyte now licenses their database on the internet, enabling other firms to use their inventions to engage in follow-on innovation. Greater patentability of genetic information (and biotechnology tools more generally) has enabled biotechnology firms to become suppliers of innovation to the pharmaceutical industry. Over time, Mr. Bendekgey believes that even more R&D will be outsourced to biotechnology firms that will have the ability and incentive to perform research for multiple firms. Protecting discoveries through intellectual property rights increases the incentive of biotechnology firms to perform these procompetitive services. Like the computer industry, the biotechnology and pharmaceutical industries will become more vertically disintegrated, which should reduce costs, enhance innovation and benefit consumers. Genomics in particular should reduce the enormous risks associated with developing and prescribing pharmaceuticals.

Mr. Blackburn added that biotechnology research tools facilitated new entry into the pharmaceutical and biotechnology fields. Research tools are used to identify and refine therapeutic candidates. For example, research tools like microarray technologies and genomic databases can be used by pharmaceutical and biotechnology companies to focus their discovery efforts on particular genes, chromosomes, or receptors. He also suggested that the distinction drawn earlier in the day between private and social efficiencies arising from patents is irrelevant. According to Mr. Blackburn, patents are intentional market distortions designed to encourage innovation; over time, the distortion produces social efficiencies and facilitates market entry. It was inconceivable only a few years ago that a pre-IPO company could have a therapy in Phase II of FDA clinical trials; today, the decreasing expense of discovery makes it almost common. Continued and full patent protection for research tools is necessary to sustain the increased pace of innovation in the pharmaceutical and biotechnology industries. Mr. Blackburn also emphasized the procompetitive role that biotechnology firms have played by licensing their innovations on a nonexclusive basis. According to Mr. Blackburn, nonexclusive licensing is the preferred path for many research companies because it is difficult to predict *ex ante* who will successfully use tools or information to develop successful therapies. In other cases, exclusive

licensing is necessary for smaller firms with multiple potential therapeutic products to sell their intellectual property to other firms with greater resources to develop discovery candidates.

Mr. Beier contributed some additional information about the biotechnology industry, noting that 70% of biotechnology companies are less than 15 years old and only 30% are publicly traded. Patents are necessary for non-publicly-traded firms to obtain venture capital financing. Although Mr. Beier agreed that research tools could accelerate the pace of discovery, he did not believe that the cost of discovery would necessarily decline. There could be a tradeoff between the time required for new discoveries and the cost of identifying new agents.

Mr. Bendekgey added some observations about the incentives to grant nonexclusive or exclusive licenses. A large measure of Incyte's commercial success is attributable to an exclusive agreement with SmithKline Beecham in the mid-90s giving SKB some exclusive rights to portions of Incyte's database. Almost every other pharmaceutical company contacted Incyte seeking nonexclusive licenses out of fear of being left behind in the race to develop new therapies based on genetic information. The incentive for companies like Incyte is generally to sell the same inputs to multiple customers.

Mr. Earp raised the issue of reach-through royalties, where licensors of research tools earn royalties based on sales of downstream products developed in part with the licensed research tools. According to Mr. Earp, neither patent nor antitrust law provides any clear answers on whether or when reach-through royalties are permissible. Some cases hold that earning royalties on products not covered by the patent could either give rise to patent misuse defenses or antitrust counterclaims. The Antitrust Guidelines for the Licensing of Intellectual Property (IP Guidelines) do not address this issue. Mr. Earp does not believe that rule of reason analysis provides either clear answers or sufficient comfort to companies seeking reach-through royalties. If rule of reason analysis focuses on market power, whose market power should be examined? How can firms negotiating the license determine market power when, by definition, no product exists? Must the licensor revisit the royalty provisions if a discovery occurs and is commercially successful? Although some agreements contemplate modifications, it is tough to negotiate open-ended terms pertaining to the revenue stream arising from the license. Mr. Earp added that some harmonization between patent misuse doctrine and antitrust law would be useful.

Mr. Blackburn said that many firms want reach-through royalties when giving nonexclusive licenses. The cost of licenses might increase if firms engaging in discovery were forced to incur greater up-front expenditures in using tools that may not result in discoveries; reach-through royalties enable licensors and licensees to share the risk of discovery. Mr. Beier added that although the National Institutes of Health had issued guidelines on reach-through royalties, nobody in the biotechnology community can agree on a percentage that is permissible or impermissible.

Mr. Oehler addressed whether research tools have accelerated discovery and reduced the cost of discovery. He cited a recent study showing that the early phase of discovery has accelerated, but so, too, has its cost. Mr. Oehler also noted that larger pharmaceutical companies, as licensees of research tools, may have a different perspective on the risks of

discovery. According to Mr. Oehler, the most expensive and riskiest phase of development occurs on the back end, when discoveries are taken through clinical trials and the FDA approval process. Mr. Blackburn agreed, noting that it is unfortunate that we do not have a system that recognizes the back-end intensity of investments in development. Ultimately, according to Mr. Blackburn, the debate over how to allocate risks between a licensor of research tools and their licensees becomes little more than a negotiation about price.

Mr. Wroblewski then asked how competition (and the race for monopoly) may affect the pace and direction of innovation. Mr. Beier responded with a discussion of mergers and innovation markets. First, he criticized the notion of relevant markets where products do not yet exist. Second, he said that mergers between IP owners may result in efficiencies even when products do not yet exist -- they may accelerate their appearance in the marketplace. Mr. Beier noted, however, that the IP Guidelines were a material improvement in enforcement policy in the area; their clarity has facilitated the ability of counselors to provide more firm antitrust advice to licensors and licensees. Mr. Oehler observed that patent length is insufficient in the pharmaceutical context, where their effective duration is shortened by the length of regulatory review. Competition only exacerbates this problem by producing a rush to patent an invention before anybody else can obtain exclusive rights to the subject matter.

Mr. Wroblewski then asked more specifically whether sequential monopolies -- a series of incumbents perpetually challenged and displaced by new entrants -- occur in the pharmaceutical and biotechnology industries, and how they may affect the pace of innovation. Mr. Oehler replied that a principal objective of the patent system is to produce a race to receive exclusive rights. But the reality of the pharmaceutical and biotechnology industries is not consistent with a sequential monopoly model -- according to Mr. Oehler, participants inhabit a multi-layered, multi-patent environment in which a number of firms coexist and compete. Mr. Bendekgey said that competition plays a significant role in the biotechnology industry. Although Incyte had a first-mover advantage in its markets, it faced stiff competition from Perkin-Elmer and potential entry from a number of firms. Mr. Bendekgey analogized Incyte's early market position to Silicon Graphics in the 3D workstation market; although both were market leaders, both eventually faced entry from significant and well-financed firms. According to Mr. Bendekgey, the principal role of competition is to encourage firms to accelerate product development even if early leaders must lose money in the process. Mr. Blackburn said that the model of sequential monopolies does not work in pharmaceuticals, but may be applicable in research tools and diagnostics (where tests may have characteristics akin to operating systems and networks, including installed bases).

Mr. Wroblewski asked whether panelists had any concerns about the quality of patents issued in the pharmaceutical and biotechnology industries. Mr. Kirschner replied that there are problems with individual patents. According to Mr. Kirschner, he has seen many patents that have not cited the best prior art. He added that although the quality of examiners at the PTO is high, more resources are needed to avoid mistakes and issue higher-quality patents. Among the most significant errors is that the PTO has issued patents covering the same claims to multiple parties.

Mr. Earp said that bad patents have a clear and adverse effect on competition. After identifying potentially blocking patents, a biotechnology firm has two choices: walk away from the field and avoid development, or take the risk of infringement and invest millions of dollars in development. Small companies usually avoid the risk and cost of litigation, even when they have serious doubts about the validity of the allegedly blocking patents. Mr. Earp suggested that although Europe's procedure for opposing patents is imperfect, it might be useful for the U.S. patent system to incorporate some of its elements to ensure that potentially interested parties have a meaningful procedure for challenging patents short of litigation. Mr. Oehler said that the issue of patent quality is not unique to the biotechnology industry. As a general matter, more resources at the PTO would increase the pace and level of examination. But he disagreed that the European opposition process would be useful in the United States. Mr. Blackburn said that one problem in the United States is the inability of firms (outside the Hatch-Waxman pharmaceutical context) to challenge patents unless they have a reasonable apprehension of being sued for infringement. In the United Kingdom, firms may sue to challenge patents if they are refused a license, even if they have not yet infringed.

Mr. Beier said that recent history demonstrates that any perceived problems in the patent system quickly correct themselves. The PTO itself often leads the charge by introducing guidelines designed to address technological challenges that threaten the legitimacy of the one-size-fits-all patent system. He specifically noted the PTO's guidelines on gene patents (particularly its discussion of utility and specificity). He also said that the Federal Circuit's decisions have also had a positive impact on the development of a more effective patent system, enabling patent law to remain consistent with technological change while providing clear guidelines to the PTO. Even if there are problems in the patent system, Mr. Beier said that we should consider the problems -- both foreseeable and unforeseeable -- that reforms would create. He cited the problems created by Japan's adoption of an opposition process in their patent system.

Ray Chen from the PTO commented that the biotechnology industry has done a number of things to help the PTO to adapt to technological change. He asked whether proponents of an opposition system had any specific proposals, and whether reforms to the current reexamination process might be an effective way to introduce more effective opposition to bad patents. [Mr. Chen noted that bills on further reexamination reform are pending in Congress.] Mr. Earp replied that few firms are using reexamination procedures because of its preclusive impact on some issues that may arise in subsequent litigation and the inability to appeal. Mr. Bendekgey agreed that the lack of appeal is a significant downside to using the reexamination process to challenge the issuance of a patent, especially when firms anticipate infringement litigation down the road.

Susan DeSanti from the FTC asked whether the declining quality of patents had any significant impact if firms litigated the most significant patents in the field, and whether there should be continue to be a presumption of validity under patent law after issuance. Mr. Kirschner said that policymakers should be very careful about the inferences they draw from the absence of litigation -- although some significant patents may be subject to challenge, firms are often unwilling to incur the risk and cost of litigating them, and either accept licenses or avoid the field.

Sue Majewski from the Department of Justice asked whether biotechnology firms avoid royalty-stacking through patent pools, and whether there were any examples of excessive royalties. Mr. Kirschner replied that Immunex must pay six or seven entities for its development and sale of Enbrel. Reach-through royalties for the use of research tools are an increasing commercial problem for firms attempting to develop new therapies.

Mr. Beier said that patent thickets are not an issue in the biotechnology industry. He added that compulsory licensing would be bad public policy; if, in fact, there are thickets, patent pools can remedy the problem of access for other companies by granting nondiscriminatory, nonexclusive licenses. Mr. Blackburn agreed that patent thickets were not a significant problem in the biotechnology industry. He did not think that pools would necessarily be an efficient solution, especially in the case of research tools. Licensors are aware that excessive royalties will prevent the licensee from making money from its discovery; ultimately, the parties will negotiate a commercially efficient solution. Mr. Bendekgey analogized Incyte's database to a pool in which licensees may voluntarily grant back a nonexclusive license to the pool if they identify promising or interesting genes. The grantback permits other licensees to engage in research.

Susan DeSanti from the FTC said that Judge Pauline Newman of the Federal Circuit had observed on the first day of hearings that a principal benefit of the patent system is the disclosure of innovations and the positive impact that disclosure has on follow-on innovations. Ms. DeSanti asked whether patent disclosures are useful in biotechnology and pharmaceutical R&D. Mr. Kirschner said that patent disclosures have not been that useful to Immunex. Articles in the field (often leading to patents) are an important source of information. But patents themselves are usually not. Mr. Kirschner cited the example of patents that Immunex was forced to license from others when developing Enbrel; Immunex had already completed the work in-house when patents were issued. Mr. Blackburn disagreed, saying that patent filings are an increase source for research and that scientific literature is often based on patent filings. Mr. Oehler suggested that scientific literature was more useful because of the 18-month blackout between patent applications and publication.

Panelists were then given an opportunity to provide their concluding remarks. Mr. Beier said that the biotechnology industry would like more clarity in law and policy on the unilateral right of patentholders to refuse licenses to others. He noted the conflict between the Federal Circuit's decision in *In re Independent Service Organizations Antitrust Litigation*<sup>53</sup> and the Ninth Circuit's decision in *Image Technical Services v. Eastman Kodak Co.*<sup>54</sup> Mr. Beier also said that it was important for U.S. policymakers to do nothing inconsistent with traditional U.S. positions asserted with respect to TRIPS, especially the emphasis in TRIPS on the patentability of all technologies (and the importance of one-size-fits-all rules).

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<sup>53</sup> 203 F.3d 1322 (Fed. Cir. 2000) (in the absence of tying, sham litigation or fraud on the PTO, patentholders enjoy antitrust immunity for unilateral refusals to license patents or sell patented goods).

<sup>54</sup> 125 F.3d 1197 (9<sup>th</sup> Cir. 1997) (holding that patentholders have only a presumptive business justification in refusing to sell patented goods or license patents which may be rebutted by evidence of pretext; affirming liability under Section 2 when evidence showed pretext).

Mr. Blackburn addressed the issue of double patenting and team research, contending that any perceived bias in favor of larger companies (with multiple research teams) was nothing more than leveling the playing field. Overly strict views of invention would otherwise deprive larger companies of patents that smaller firms would undoubtedly receive. He added that a *de facto* fair use exemption for infringing research already exists in patent law; the invisibility of most pure research undermines effective patent enforcement. Mr. Blackburn also said that it would be useful to eliminate uncertainties created by the distinction drawn in the U.S. system between the first-to-invent and the first-to-file, which can lead to protracted, expensive interference proceedings.

Mr. Earp said that although the PTO does remarkably well in the biotechnology field, it would be useful to adopt aspects of the European opposition system. Reexamination reform would not be sufficient. He also said that the enforcement agencies should consider issuing new IP Guidelines that would contain more examples and address more specific issues that routinely arise in the licensing context, such as reach-through royalties.

Mr. Kirschner said that the biotechnology industry would not exist without patents, and that the patent system is fundamentally sound. But the decreasing quality of patents can adversely affect innovation in the field. Greater resources at the PTO are needed not just to reduce the pendency periods of applications, but also to increase the quality of the examination and reexamination processes.

Mr. Wroblewski thanked the participants for their contributions, and the session closed.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of Business  
Perspectives on Patents: Software and the Internet

February 27, 2002  
Morning Session

The Federal Trade Commission and Department of Justice began their third day of hearings on the implications of competition and intellectual property law and policy in Berkeley, California by focusing on perspectives on patents in software and internet industries. Panelists included:

- **Yar R. Chaikovsky**, General Counsel, Zaplet, Inc.
- **Bradford L. Friedman**, Director of Intellectual Property, Cadence Design Systems, Inc.
- **R. Jordan Greenhall**, Chief Executive Officer, Divx Networks.
- **Joshua Kaplan**, President and Chief Executive Officer, Intouch Group, Inc.
- **Robert H. Kohn**, Vice Chairman, Borland Software Corporation.
- **Paul Misener**, Vice President, Global Public Policy, Amazon.com.
- **David C. Mowery**, Milton W. Terrill Professor of Business, University of California, Berkeley.
- **James Pooley**, Partner, Milbank, Tweed, Hadley & McCloy.

Below is a summary of the group's discussion.

### **Opening Remarks and Introductions**

FTC staffer Michael Barnett opened the session by outlining the issues that panelists would address and asking participants to introduce themselves and their companies.

Joshua Kaplan explained that Intouch was founded in 1990 based on patented in-store kiosk technology that enabled it to collect information from shoppers who listen to music in record stores. In 1995, Intouch became an online business; in 1999, it patented online methods of previewing music and collecting information about previewers. After securing its patents, Intouch placed 190 alleged infringers on notice, ultimately commencing litigation against six and settling with five.

Robert Kohn discussed Borland Software, one of the early leaders in the software industry whose litigation with Lotus was a landmark in copyright law affecting computer software.<sup>55</sup> After some fits and starts, Borland has recently refocused on developing new software tools for developing, deploying and integrating enterprise-level software applications. After initial skepticism about the utility and appropriateness of patents in the software industry, Borland itself filed 200 patent applications from 1987 to 1996.

James Pooley from Milbank, Tweed, Hadley & McCloy is an intellectual property lawyer in Silicon Valley, an adjunct Professor of Law at the University of California at Berkeley, and is on the Board of Directors of the American Intellectual Property Law Association. He has been a trial lawyer for almost 30 years; his recent litigation has focused on software and business method patents.

Yar Chaikovsky is General Counsel of Zaplet, a provider of enterprise software and services. Before joining Zaplet, Mr. Chaikovsky was the sole in-house patent lawyer at Yahoo, one of the leading internet portals.

Jordan Greenhall explained that Divx seeks to provide DVD videos over the internet. Before joining Divx, Mr. Greenhall was a Vice President at mp3.com, a leading provider of online music.

Paul Misener is Chief Public Policy Officer for Amazon, one of the world's leading e-commerce companies. Amazon holds 22 patents.

Brad Friedman is from Cadence Design Systems, the leading provider of electronic design automation software, used chiefly by the semiconductor industry. He noted that Cadence's patent portfolio has grown more through acquisition than innovation. Before joining Cadence, Mr. Friedman was with Varian Medical Systems.

### **Robert H. Kohn**

Mr. Kohn offered an introductory presentation designed to set the tone for the discussion. First, he said that intellectual property protection is necessary to produce an efficient amount of goods and ideas. Absent protection, firms would produce too few goods. But too much protection can also result in a less-than-optimal amount of goods and ideas, particularly if protection extends to complementary products.

Mr. Kohn then explained the nature of intellectual property protection for software. As a general matter, software firms receive copyright protection for source code; they seek patents for software processes. As a theoretical matter, there are hundreds and perhaps thousands of patentable ideas in software code, but as a practical matter, most firms do not find it economically useful to patent them. The marginal benefits of patentability (both for firms and society) are questionable if source code is already copyrighted.

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<sup>55</sup> See *Lotus Development Corp. v. Borland Int'l*, 49 F.3d 807 (1<sup>st</sup> Cir. 1995) (holding that computer menu command hierarchies not copyrightable subject matter), *aff'd by equally divided Court*, 116 S. Ct. 804 (1996).

In the software industry, innovation is driven more by competition than by intellectual property protections. Short product life cycles and frequent product improvements require competitors to respond with their own innovations. Patents are usually sought only for defensive purposes. Although patents may embody product improvements, the product improvements result more from the need to compete than from the desire to receive exclusive rights.

Larger software companies are frequently confronted with threat letters alleging infringement. Patentholders often request royalties well in excess of the economic value of their alleged innovations. For example, a single software product may read upon hundreds of patents; a firm with a single patent may request 10% of gross sales in exchange for a license. If other firms make similar requests, the cost of securing licenses can frequently exceed any revenues received from the product. According to Mr. Kohn, one area for potential reform is to overhaul the determination of damages in such contexts, requiring the patentholder to quantify and prove the actual economic contribution of its innovation to the allegedly infringing product.

### **Bradford L. Friedman**

Mr. Friedman explained that Cadence's principal business -- electronic design automation software -- is sold to other businesses (usually semiconductor designers and producers), not to consumers.

Although Cadence, like many other software companies, believes that innovation is valuable, Mr. Friedman said that the benefits of the patent system (as structured today) are questionable. Competition is clearly a more significant factor than the patent system in explaining the level and pace of innovation. Industry conferences and articles are a more significant source than patent applications for research and development.

There are five principal reasons for the software industry's general hostility to patent rights and the PTO: (1) overbroad claims; (2) the openness of software industry culture; (3) the PTO's inability to identify prior art that would undermine many software patents; (4) skepticism about the actual process of issuing patents; and (5) in the EDA industry specifically, the low volume of patent litigation, reflecting pervasive cross-licensing and industry-wide detente.

Mr. Friedman doubted whether significant change or reform could occur through litigation. He suggested instead that any material reforms would have to originate in Congress. For example, greater distinctions between useful and nonuseful inventions in software (whether in determining patentability or damages) are unlikely to occur in the courts. Perhaps Congress could consider the adoption of more restrictive patent scope or duration for specific industries. Perhaps Congress could also consider eliminating the statutory presumption of validity in some industries.

Mr. Friedman also noted the increasing shift in the software and computer industries from *de facto*, proprietary standards to open, industry-wide standard-setting organizations directed at interoperability. Mr. Friedman wondered whether antitrust enforcement policy would become less restrictive when applied to more open standard-setting organizations.

## **Joshua Kaplan**

Mr. Kaplan said that his objective was to provide the perspective of a small business with intellectual property attempting to survive among entertainment and internet giants. Intellectual property, according to Mr. Kaplan, could provide smaller businesses greater access to new markets, such as the provision of online music.

But after securing a patent on the previewing of online music and the collection of information about previewers, Intouch faced significant obstacles in enforcing its patent against other firms -- including larger competitors -- that were allegedly infringing it. Only one or two companies responded to Intouch's first 40 infringement letters; those few responses inevitably contended that Intouch's claims were meritless, but asked for claim charts explaining infringement.

According to Mr. Kaplan, intellectual property protection was essential to Intouch's ability to protect significant investments in encoding music that would be previewed online. Intouch had encoded music for digital distribution before new tools made the process significantly less expensive and more rapid; new entrants could easily replicate Intouch's business model without incurring its costs. That left Intouch with no choice but to assert its patents.

Litigation costs were, however, a significant burden. In addition to spending over \$3 million in litigation fees, Intouch was forced to surrender an equity position to its first law firm. Only when a larger partner in the music industry was willing to fund the litigation was Intouch willing and able to proceed more aggressively.

Mr. Kaplan expressed his frustration with social and industry perceptions of infringement litigation. The pervasive disrespect for intellectual property rights in the software industry is, according to Mr. Kaplan, unsettling. The view that the PTO is dysfunctional and hands out patents "like jelly beans" is fundamentally misguided; Mr. Kaplan noted that Intouch needed eight years to obtain its patents. Mr. Kaplan suggested that the PTO should resurrect Edison to be a spokesperson and to remind people of the importance of intellectual property protection to small companies and individual inventors. He also said that he would like to see the PTO provide financial assistance to small companies in enforcing their patents. It is unlikely that many smaller companies can afford the time or money to defend their intellectual property rights.

## **Dr. David C. Mowery**

Dr. Mowery offered a summary of his study of intellectual property in the software industry. The study, co-authored by Stuart Graham, was conducted for the National Academy of Science's Board of Science, Technology and Economic Policy.<sup>56</sup>

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<sup>56</sup> A powerpoint presentation summarizing Dr. Mowery's and Dr. Graham's study can be found at [www7.nationalacademies.org/step/Mowery2\\_presentation.ppt](http://www7.nationalacademies.org/step/Mowery2_presentation.ppt).

Although Dr. Mowery believes we do not yet know the full effect of the internet on the software industry, some preliminary conclusions can be drawn. First, the internet has facilitated the growth and dissemination of open source software ("shareware squared"), and could result in a unified source code for free software. This trend represents a significant challenge to traditional models of intellectual property protection and innovation. Second, the internet has reduced distribution costs for commercial software companies, facilitating entry and increasing competition. Third, the internet has created a new space for patented business methods.

Professor Mowery then discussed five principal trends that he has identified in software patenting. First, software patents have grown over the past 15 years to account for 3% of all issued patents in the U.S. Second, large packaged software sellers have increased their respective shares of all issued software patents. Third, large electronic systems producers (such as Motorola, Intel and IBM) have increased their collective share of all issued software patents. Fourth, from 1987 to 1997, large software companies increased their number of patents per R&D dollar. IBM in particular has intensified the patenting of its R&D. Fifth, although the metrics for determining patent quality are necessarily imprecise, Dr. Mowery believes there has been no noticeable deterioration in software patent quality. Dr. Mowery said that his data, as well as the economic measures of the data, were too imprecise to give rise to robust results. Dr. Mowery also noted that statistical analyses tend to overrepresent packaged software patents and underrepresent embedded software.

### **Jordan Greenhall**

Mr. Greenhall discussed his experiences with the patent system at Divx, his current employer, and at Interview, one of his previous employers. Although Interview made "egregious" amounts of money from its patent portfolio, and although Divx is likely to do so, Mr. Greenhall said that he agreed with some of the concerns expressed by Mr. Kohn and Mr. Friedman about the functioning of the U.S. patent system, especially in the software industry.

Mr. Greenhall first discussed the increasing phenomenon of "patent farms" -- firms engaged almost exclusively in the development of patent applications instead of the development of products. He contended that one could identify patent farms by dividing the number of engineers by the number of lawyers at the firm. Mr. Greenhall also discussed the use of patent FUD -- fear, uncertainty and doubt -- to pressure software companies into accepting licenses or staying out of particular markets. Mr. Greenhall also criticized the lack of transparency in the patent system. The lack of clarity in patents and patent applications significantly increases risks for firms contemplating entry into particular markets; infringement, even when inadvertent, can put smaller companies out of business. Divx's thorough review of seemingly relevant patents, conducted in conjunction with scarce and valuable engineers, revealed no greater clarity about whether Divx's products would infringe. Divx was compelled to develop a patent portfolio for defensive purposes. Mr. Greenhall also pointed to the windfalls that companies can enjoy if their patents are incorporated into international standards. According to Mr. Greenhall, Divx could enjoy modest profitability simply by creating 20 patents a year and enjoying royalties resulting from their incorporation into international standards. Compared to competition in actual product

markets, the risk of investing in patent development is low relative to the potential returns that firms can enjoy from seeking licenses.

### **James Pooley**

Mr. Pooley emphasized from the outset that his views represented his own, and did not necessarily represent the views of Milbank, Tweed, Hadley & McCloy or its clients.

Mr. Pooley thought it would be useful at the outset to draw a distinction between the quality of patents and the quality of the dispute resolution process arising from the enforcement of patents against others. The litigation process -- its costs, benefits and risks -- determines whether firms will attempt to obtain licenses or avoid certain areas of the marketplace where patents seem pervasive. Today, there is a great deal of uncertainty in resolving disputes; even assuming rational behavior on the part of participants, individual businesses still face an enormous amount of uncertainty in determining what is likely to occur in litigation. Lay juries are unpredictable; the doctrine of equivalents muddies and expands the scope of patents and potential infringement; breadth of patents can seemingly expand during litigation.

Thus, although entry into many software and internet segments seems easy, it is difficult for firms to determine what and how much intellectual property is required to enter. Even if start-ups are willing to incur the costs of conducting detailed patent searches before entering, they increase the risk of incurring treble damages in subsequent infringement litigation. And even after thorough patent searches, there is inevitably the risk that multiple firms will approach a new entrant requesting exorbitant portions of the new firm's current and future revenue streams based on fairly insignificant patents.

Mr. Pooley discussed other aspects of the patent system that require reexamination and potential reform. According to Mr. Pooley, overcoming the presumption of patent validity with clear and convincing evidence is a very difficult process, especially before lay juries. It is also difficult, expensive and time-consuming to identify information on prior art. Mr. Pooley also pointed to the problem of using commercial success as a factor in the nonobviousness inquiry -- commercial success often results from a number of other factors that have nothing to do with whether one of many patents or features was or was not obvious. The time and expense of litigation take a significant toll, especially on smaller firms in markets with rapid product life cycles.

Mr. Pooley said that the PTO was doing a fairly good job in managing the explosion of patent applications over the last decade. Reform should focus primarily on the dispute resolution process.

### **Discussion Session**

Michael Barnett asked whether and how patents were affecting the direction of research, development and innovation. Mr. Chaikovsky replied that competition, not patents, is the primarily stimulus to Zaplet's innovations in the packaged software business. At the same time, however, the threat of potential patent infringement lawsuits has forced Zaplet to apply for its

own patents. The most significant value of intellectual property in the software industry is to create Mutual Assured Destruction between rivals, in which neither has the incentive to commence infringement litigation that could result in both having to pay significant infringement damages. In addition, although start-up firms usually receive funding based on their product ideas and business plans, intellectual property assets can also provide additional comfort to potential investors.

Mr. Chaikovsky reminded the audience, however, that Yahoo, his previous employer, achieved significant commercial success with very little intellectual property. It began to focus on seeking intellectual property protection only when other firms with more significant intellectual property portfolios began to flex their muscles. Less important to Yahoo were numerous threat letters received from smaller companies like Intouch; Yahoo did not believe that it would be useful to assert infringement counterclaims against judgment-proof defendants. Mr. Chaikovsky discussed one case in which a woman from New Zealand contended that she had patented universal shopping carts. Another case involved alleged patents on internet-based Fantasy Football, a game that originated on paper years ago. All of these cases were allegedly meritless, but each wasted time and money. Mr. Chaikovsky said that these and other cases justify the pervasive antipathy in Silicon Valley and the software community towards patents. Most recognize that competition, not patents, drives innovation in the software industry. Nevertheless, some protection is necessary to prevent outright pirating.

Mr. Misener said that patents and innovation are not mutually exclusive objectives, even in the context of software and the internet. Intellectual property protection can serve valid business objectives by protecting new and interesting ideas that offer consumers better services. Amazon itself has sought and received protection for significant innovations in e-commerce. At the same time, Amazon is conscious about the antipathy towards patents in the software community, particularly among proponents of open source software. Mr. Misener noted that Amazon actively engaged the open source movement on how to improve the patent system, particularly with respect to business methods. After discussing ideas on reform, Amazon approached legislators with novel proposals, including a pre-issuance period for public comment on applications for business method patents. Amazon has also lobbied Congress to ensure that the PTO is able to retain more of the funds that it generates from application fees; greater revenues may reduce pendency periods and improve the quality of examination.

Mr. Kaplan noted his disagreement with earlier suggestions about the inadequacy of the patent system. He said that Intouch, like larger internet and software companies, received backing from the venture capital community. Like other successful companies, it had an attractive business model. But the development of the internet and the emergence of new rivals presented a significant threat to Intouch's business in the absence of intellectual property protection; rivals could cheaply imitate its innovations without incurring the costs of development. Although Intouch has been able to reach settlements with e-commerce providers like Amazon, Mr. Kaplan believes that the process of successfully asserting Intouch's intellectual property rights was too long and too expensive. Mr. Chaikovsky responded that companies like Yahoo received threat letters from a variety of firms on a regular basis, and that some delay in responding should be understandable, especially when many threat letters were spurious on their face.

Mr. Barnett asked whether the group could recommend any solutions to some of the problems with patents in the software and internet industries. Mr. Pooley said that some pre-issuance public comment might be useful and could increase the efficiency of the patenting process. This would enable the PTO to receive material information about prior art that would otherwise be inaccessible. But a full-scale opposition process might create costs and delay. Mr. Pooley also said that shortening the terms of patents in specific fields (such as software) might have unintended consequences and could conflict with international treaty obligations. Although the issuance process could be improved, the real problem in the system remains the dispute resolution process.

Dr. Mowery commented on other reform proposals. Reexamination in the United States is, by congressional design, fundamentally different than the European opposition process. Data suggest that nearly 50% of the reexaminations in the U.S. are initiated by the patentholder itself. Would a more elaborate system of post-issuance reexamination, akin to Europe's opposition process, improve quality? Dr. Mowery said that it was important to remain cognizant of the costs of an opposition process, including the immense delay that results from the appealability of opposition decisions. He also noted that the opposition process in Europe does not eliminate the possibility of subsequent litigation. At this juncture, the costs and consequences of incorporating an opposition process into the U.S. system remain uncertain.

Mr. Friedman suggested that one alternative is to limit an opposition process to the submission of prior art by third parties. He also said that it might be useful to consider the adoption of a two-tier patent system (akin to the petty patent system in Germany), but noted that such a system might impose administrative costs and burdens in the pre-issuance phase. Mr. Friedman added that software companies generally do not use patent applications to conduct research or derive strategic intelligence about their competitors; most companies are aware that patent applications routinely contain a number of overbroad claims. Focusing on patent applications by rivals may lead firms either to underestimate their competitors or to innovate beyond the existing art described in other patent applications. Neither is a recipe for commercial success.

Mr. Kohn said that although he could offer no hard facts about the PTO, he has seen a number of business method and software patents that were either obvious or overbroad. He also questioned whether the PTO's focus has been appropriate, citing a speech by a previous PTO Commissioner emphasizing the increasing number of patents issued by the PTO. The focus should, according to Mr. Kohn, be upon quality, not quantity. Mr. Kohn also reiterated his concerns about unreasonable requests for royalties from multiple firms whose patents do not make any economically or technologically significant contribution to an allegedly infringing product. Mr. Pooley said that the formation of a consortia or a government-imposed system could reduce the hazards of multiple infringement threats; alternatively, during infringement litigation, an alleged infringer could implead all firms possessing intellectual property that may be infringed to ensure that reasonable royalties would be paid, and let the IP owners fight among themselves over who had contributed the most to the success of the infringing product. According to Mr. Pooley, however, all of these solutions are imperfect.

Mr. Whitehall discussed the formation of the MPEG patent pool, designed to resolve a patent thicket that arose in the digital video space. All owners of essential IP would combine essential patents and license them on a reasonable, nondiscriminatory basis. Although the first two iterations of MPEG worked reasonably well, some participants are now engaged in strategic behavior designed to undermine the standard-setting process. As more owners of IP engage in strategic behavior, the pool is less likely to be able to guarantee noninfringement. Divx's response to the increasing strategic use of IP has been to shift some resources away from innovation to patenting. Although Mr. Whitehall understands why patents may be appropriate for industries where R&D is expensive and risky, as in biotechnology, he questions whether other industries should enjoy the same levels of protection for investments that are far less risky or competitively significant.

Ray Chen from the PTO commented on some of the observations offered by other panelists. First, he noted that the PTO has done nothing more than follow patent law as articulated by the Federal Circuit. Second, he said that the PTO Commissioner's comments about the increasing quantity of patents was a positive remark about increased innovation in the private sector and the challenge of technological change. Third, Mr. Chen acknowledged that the current reexamination process has problems, but that reform legislation is currently pending in Congress. Mr. Chen then asked whether there was anything unique about the software industry that justified a different standard or system for patents.

Dr. Mowery replied that there were some differences that could be significant, but they would not necessarily justify a different patent system for software. First, he observed that the software industry, like other nascent fields, had gone through an initial period where prior art was difficult to identify. That is becoming less true over time. Second, a single software product, like computer hardware and semiconductors, could potentially infringe hundreds of patents. Third, the cost of entry is low, leading to a number of smaller, fringe firms interacting with very large incumbents. Mr. Kohn added that prior art can be hidden by object code in software. Moreover, software can also be copyrighted, reducing the need for additional intellectual property protection.

Pam Cole from the Department of Justice asked participants about the appropriate role of antitrust enforcement in cases involving questionable assertions of intellectual property rights. She noted that the San Francisco field office of the Antitrust Division recently initiated an investigation of a larger firm acquiring intellectual property rights and enforcing them against a smaller business. Mr. Kohn replied that when Lotus sued Borland, Borland considered adding antitrust counterclaims, but ultimately decided not to file them after discovering that counterclaims would enable Lotus to invoke insurance coverage for their litigation costs. Mr. Pooley said that antitrust counterclaims have been arising more frequently in infringement litigation. Judges, however, have remained skeptical about sham litigation counterclaims, tending to bifurcate or postpone antitrust adjudication until the merits of the infringement suit are resolved. Allegations of refusals to license patents or sell patented goods are also likely to be met with skepticism, especially in the wake of the Federal Circuit's recent decision in *In re Independent Service Organizations Antitrust Litigation*.<sup>57</sup> Ms. Cole said that although recent

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<sup>57</sup> 203 F.3d 1322 (Fed. Cir. 2000) (in absence of tying, sham litigation, or fraud on the PTO, patentholder enjoys antitrust immunity for refusals to license patents or sell patented goods).

decisions from the Federal Circuit did not bode well for antitrust counterclaims to infringement lawsuits, there remained a lot of good law for antitrust plaintiffs to employ.

Mr. Barnett asked the panelists to discuss the nature of licensing, patent pools and standard-setting. Mr. Pooley said that virtually all patent licenses are confidential, leaving licensees significant concern they are paying more royalties than their competitors. If licensing terms were more transparent, negotiations would proceed more smoothly. Mr. Friedman said that Mr. Pooley's suggestion of mandatory impleader in cases involving potential infringement of multiple patents is intriguing. Although it would not be a panacea, it could reduce uncertainty. Mr. Friedman also said that compulsory licensing may be appropriate in very limited and specific circumstances. Mr. Pooley cautioned that compulsory licensing could result in a significant erosion of the core intellectual property-based right to exclude. Perhaps, instead, the dispute resolution process could be reformed to permit patentholders to obtain injunctive relief only when they also practice the invention. This could reduce the practical threat of infringement suits from firms that are not vulnerable to infringement counterclaims. Mr. Kohn replied that compulsory licensing could be appropriate when firms engage in antitrust violations; he also noted statutory provisions for compulsory licensing in some contexts. Mr. Friedman said that a number of practical alternatives were available to improve the patent system quite significantly.

Mr. Barnett thanked the participants for their contributions, and closed the session.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of "Diverse  
Perspectives on Patents"

February 27, 2002  
Afternoon Session

The Federal Trade Commission and Department of Justice continued their third day of hearings on the implications of competition and intellectual property law and policy in Berkeley, California by focusing on diverse perspectives on patents. Panelists included:

- **Greg Aharonian**, Editor, Internet Patent News Service.
- **John Love**, Director, Technology Center 2100, United States Patent and Trademark Office.
- **Luis Mejia**, Senior Associate, Office of Technology Licensing, Stanford University.
- **Rick D. Nydegger**, Shareholder, Workman, Nydegger & Selley.
- **John Place**, Executive Director, Center for Internet and Society, Stanford University Law School.
- **Carl Shapiro**, Transamerica Professor of Business Strategy and Professor of Economics, Haas School of Business, and Director, Institute of Business and Economic Research, University of California, Berkeley.
- **Robert P. Taylor**, Partner, Howrey, Simon, Arnold & White LLP.
- **David J. Teece**, Mitsubishi Bank Professor of International Business and Finance, University of California, Berkeley.
- **Les J. Weinstein**, Partner, Squire, Sanders & Dempsey.

Below are summaries of their individual presentations and group discussion.

### **Opening Remarks**

FTC staffer Hillary Greene opened the session by introducing the panelists and discussing some of the issues they would address. Ms. Greene said that panelists would focus principally on the tradeoff between disclosure and the right to exclude embodied in patent law -- whether the tradeoff was, on balance, socially beneficial, and how the tradeoff is executed in reality at the PTO, in the courts, and in the marketplace.

## **Les J. Weinstein**

Mr. Weinstein began his presentation<sup>58</sup> by emphasizing that his views do not necessarily represent the views of Squire, Sanders & Dempsey or its clients.

Mr. Weinstein said that the hearings were an important and arguably essential step in coming to grips with a patent system that has become dysfunctional. Instead of granting patents based on innovation, we are granting patents based on investments. According to Mr. Weinstein, if the objective is to encourage investments, tax policy is preferable to giving investors the right to exclude. The PTO is in the unenviable position of being caught between the holdings of the Federal Circuit, statutory mandates, and constraints on both financial and human resources. It now issues too many patents with too many claims that cannot be understood even by experts in the field. Claims have become unintelligible, leading federal judges to misconstrue them in early phases of litigation and increasing the rate of reversals at the appellate level. The ambiguity of claims and the uncertainty of litigation jeopardize investments by alleged infringers in entering or remaining in affected markets. Patentholders can hardly be blamed for responding to this system by seeking more patents; it is nothing more than a rational and predictable response to the rules of the game. But the impact of the rules may be entrenching incumbents at the expense of new entrants or mavericks. Mr. Weinstein wondered whether Bill Gates or Steve Jobs could navigate the thicket of patents in the software industry if they were starting out today.

## **Greg Aharonian**

Mr. Aharonian said that the chief problem in the patent system is that applicants and their lawyers are abusing the spirit, not the letter, of the patent laws. The declining quality of patents is attributable largely to strategic behavior by applicants.

According to Mr. Aharonian, the PTO is not solely to blame. Examiners facing increasing numbers of applications must make a decision in essentially two passes. Notwithstanding the existence of almost 10 million computing-related publications, prior art is rarely cited in computer and internet patents, and when it is, it is frequently incomplete.<sup>59</sup> Many applicants are conducting no search for prior art; overworked examiners with considerably fewer resources do not have the time or ability to search for all potentially relevant prior art. The lax nature of disclosure requirements only exacerbates the problem, requiring applicants to cite only prior art with which they are familiar, and not requiring applicants to conduct more thorough searches. Ironically, many of the most prolific patent applicants in the computer and software community have the computing resources necessary to conduct rapid and low-cost searches that would reveal prior art that could undermine their applications.

Mr. Aharonian said that innovation has been largely incremental in the computer industry; most change occurs through improvements, not through revolutionary discoveries. If

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<sup>58</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020227lesweinstein.pdf](http://www.ftc.gov/opp/intellect/020227lesweinstein.pdf).

<sup>59</sup> Mr. Aharonian's statistics on prior art citations for U.S. computing patents shows that although the number of prior art citations generally increased from 1976 to 2001, 61% of computer patents do not cite any non-patent prior art references. His statistics may be found at [www.ftc.gov/opp/intellect/020227gregaharonian.pdf](http://www.ftc.gov/opp/intellect/020227gregaharonian.pdf).

requirements of novelty were taken seriously, at least half of computing-related patents would be invalid. Disclosure of prior art would make clear that a significant number of claims are obvious. The cost of requiring additional search and disclosure would not be significant, especially compared to the overall expenditures that applications routinely make in seeking patents. But the social benefits would be substantial. Litigation is generally not a sufficient remedy for the issuance and enforcement of bad patents. District judges and juries routinely make mistakes; patentholders can hide behind the "canard" of presumptive validity; and litigation itself is expensive and risky for alleged infringers.

### **John J. Love**

Mr. John Love from the PTO gave a presentation on steps that the PTO has taken to improve patent quality.<sup>60</sup>

Mr. Love first discussed the nature of patent rights. Claims in the patent define the scope of the invention. Claim interpretations are questions of law, not fact, and are based on specifications and prosecution histories. The core of the patent grant is the right to exclude others from making, using or selling the invention, and the grant itself is constitutional in nature.

Third parties can participate in the patenting process at three basic stages. First, they can become involved before patents are granted but after applications are published. Second, they can protest patent applications under 37 CFR § 1.291. Third, after patents have been granted, third parties can cite prior art under 37 CFR § 1.501, engage in *ex parte* reexaminations; participate in *inter partes* reexaminations, and assert invalidity as a defense in patent litigation.

Mr. Love then explained that the PTO has rigorous and routine internal assessment of the quality of its examination process. In the software and e-commerce patent offices, the error rate has steadily declined over the last three years, reaching new lows in 2001.

Part of the increase in software and e-commerce patent quality may be attributable to business method patent initiatives commenced by the PTO in 2000. A central part of the initiative has been industry outreach (e.g., training of examiners, identifying new sources of non-patent literature for prior art checks, and discussing business method patent issues). The office has also focused on "customer partnership," inviting over 30 industry organizations and companies to discuss business method patent issues. In addition to discussing new sources of potential prior art literature with industry organizations, the PTO issued a Federal Register notice requesting input on additional sources of prior art that the PTO could use. The notice contains a complete list of the current core databases used by examiners in reviewing business method patents, as well as a detailed description of the mandatory search that examiners currently undertake.

The PTO has also enhanced technical training for examiners of business method patent applications. Private industry has provided some of the technical training. For example, the NASDAQ stock exchange provided technical training on e-trading principles; the American

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<sup>60</sup> Mr. Love's presentation may be found at [www.ftc.gov/opp/intellect/020227johnlove.pdf](http://www.ftc.gov/opp/intellect/020227johnlove.pdf).

Bankers Association gave training on digital signatures. In addition, the PTO has revised its examination guidelines for computer-related inventions (to reflect recent judicial decisions on business method patents). The PTO has also independently expanded its current search activities, establishing minimum mandatory search criteria for examining business method patent applications. Finally, the PTO has imposed second-level reviews of all business method patents initially allowed, ensuring that search requirements have been met and that the scope of claims is appropriate.

The result of the initiatives: the allowance rate for business method patents dropped from 55% in 2000 to 45% in 2001 (compared to an overall average of 69%). The number of business method patents dropped from 899 in 2000 to 433 in 2001.

### **First Group Discussion**

Mr. Weinstein asked Mr. Love whether it was proper for the PTO to refer to patent applicants as "partners" and "customers," and why it would not be more appropriate to refer to the "public interest" as the PTO's principal partner. Mr. Love explained that in addition to patent applicants and industry organizations, the PTO has also solicited input and participation from the press and academia about business method patent issues.

Responding to Mr. Aharonian's comments about the strategic behavior of patent applicants and their outside counsel, Mr. Robert Taylor said that it was contrary to his experience as outside counsel that patentholders routinely commence litigation without extensive due diligence to determine whether the expensive and time-consuming process of litigation would be worthwhile. Mr. Taylor said that clients often want to be certain that they will prevail in litigation. Mr. Taylor then asked Mr. Love whether the PTO is taking sufficient advantage of databases that would include non-patent literature in its searches for prior art. Mr. Love replied that examiners have over 900 commercial databases available at their terminals.

Professor Carl Shapiro asked Mr. Love whether the PTO would be receptive to stricter search requirements for certain patent applicants. Mr. Love responded that he was not advocating more expansive searches for prior art by applicants. Internal reforms, better training, and increased emphasis on quality review at the PTO have already resulted in narrower claims from business method patent applicants.

Mr. John Place provided his comments about the quality of the examination process at the PTO and its implications for start-up companies. The nature of the PTO process inevitably influences firm behavior and internal allocations of resources. So, too, however, do other economic factors. For example, although the PTO's initiatives in the business method patent field may have had some effect on increasing patent quality, Mr. Place also pointed out that applications had dropped significantly, reflecting greater economic constraints on start-ups in 2001 than in the previous three years. He also said that small and medium-sized companies face significant resource constraints in searching for prior art, whether as part of their own applications or in their attempts to challenge patents owned by others. The real question is not whether these costs will be borne, but who should bear them. Mr. Place noted that another important contribution to the PTO's increasing effectiveness in the field is the reversal of their

long-standing policy against employing software engineers as examiners. Mr. Place said that the PTO should also consider hiring people with experience in finance or e-commerce to review applications for business method patents.

Mr. Aharonian provided additional comments about his experiences with patent quality. Based on his experience in conducting approximately 500 invalidity searches over the past five to six years, he believes that at least 80% of patents in the computing field will have at least one invalid claim. Similar estimates have emerged in Mr. Aharonian's surveys of the patent community. Mr. Aharonian was skeptical about the PTO's internal measures of quality. He was not clear about the criteria employed by the PTO in its own quality reviews and thought that independent auditors might be more credible. Mr. Weinstein added that it would be almost malpractice for a patent lawyer not to be able to obtain patents for corporate clients. Although the PTO's allowance figures suggest lower probabilities of success, Mr. Weinstein noted that allowance rates for corporate applicants approach 90%.

FTC staffer Hillary Greene asked whether there might be a limiting principle applicable to revamped search and disclosure requirements. Mr. Taylor replied that additional search requirements may create more costs than benefits. According to Mr. Taylor, the vast majority of patents never have any commercial significance. Imposing additional search requirements for these applications would not result in much benefit and would significantly increase the costs of obtaining patents. In addition, greater search obligations would lead to even more protracted litigation over vexing issues such as intent. Mr. Luis Mejia said that the cost of greater search and disclosure requirements would be especially high for universities. He said that universities like Stanford already have sufficient incentives to do adequate searches in order to secure enforceable, strong patents.

### **Robert P. Taylor**

Mr. Robert Taylor emphasized at the outset that his views did not necessarily represent those of Howrey, Simon, Arnold & White or its clients.<sup>61</sup>

Mr. Taylor opened his presentation by discussing some fundamental principles underlying intellectual property rights and high-technology industries. First, Mr. Taylor said that reward is essential to attract capital and to provide firms the incentive to undertake significant risks. Absent intellectual property protection, inventions could be appropriated by rivals who did not incur the inventor's costs, reducing the incentive to invent in the first place. Mr. Taylor cited the example of a small surgical device producer who "lives and dies" by its patent portfolio; the firm invests 22% of their revenues in R&D. Second, patents and copyrights have proven their value as methods of "measuring reward with value." Some, perhaps even many patents, have no commercial value. But other especially innovative inventions have resulted in significant rewards for their inventors. Third, high profits for successful firms often reflect high failure rates of other firms. Success is by no means guaranteed; the pharmaceutical industry, though characterized by relatively high levels of profitability, also faces higher risks of failure in R&D. Finally, the combination of entrepreneurial ethos with venture capital financing has been a

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<sup>61</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020227robertptaylor.pdf](http://www.ftc.gov/opp/intellect/020227robertptaylor.pdf).

primary engine of economic growth. The combination of these factors has resulted in the founding and growth of many companies whose principal assets consist of intellectual property.

Mr. Taylor then provided some historical perspective on the intersection between antitrust and intellectual property law. According to Mr. Taylor, early antitrust decisions often condemned licensing restrictions, especially efforts by intellectual property owners to capture value beyond the scope of their patents. The emergence of patent misuse doctrine -- partly a response to attempts by patentholders to extend the scope or duration of their patents -- created an "odd" defense to infringement. The Supreme Court's antitrust decisions reflected an "intense hostility to intellectual property."

In the 1980s, however, antitrust law and policy with respect to intellectual property underwent a significant transformation. There were multiple reasons for the shift -- increasing concerns over the strength of foreign competitors, the more expansive application of economics to antitrust law, a change in administration, and the creation of the Federal Circuit. According to Mr. Taylor, the Second Circuit's decision in *SCM Corp. v. Xerox Corp.*<sup>62</sup> was an important harbinger. The court refused to condemn either Xerox's refusal to license its copier patents to rivals or its acquisition of copier patents at a time when the copier market did not even exist. Another important judicial landmark was the Supreme Court's decision in *Dawson Chemical Co. v. Rohm & Haas, Inc.*,<sup>63</sup> which recognized the legitimacy of and need for patentholders to attract investment. The shift resulted in fewer licensing practices subject to *per se* condemnation, a corresponding increase in the use of market power screens, and a fundamental shift in antitrust focus from the protection of competitors to the welfare of consumers.

Mr. Taylor said that reconciling antitrust and intellectual property rights can be difficult in some areas. Antitrust and intellectual property law have different timelines for determining how and when consumers should benefit; as a general matter, antitrust law is less willing to accommodate decreases in short-run consumer welfare in exchange for the prospect of long-run consumer benefits. Intellectual property is based on exactly the opposite premise. Mr. Taylor also said that antitrust and intellectual property law may be difficult to reconcile where patent owners enter agreements to share a portion of their profits with potential competitors. Although patent law generally permits a patentholder to exclude others from the scope of its patents, antitrust law may prohibit agreements between patentholders and potential competitors that reduce competition that may occur in the absence of the agreements. Antitrust and intellectual property rights may be also difficult to reconcile in the context of cross-licensing and patent pools. Finally, the increasing use of innovation market analysis in antitrust investigations may lead to greater conflict between antitrust and intellectual property principles.

Mr. Taylor turned to the effect of competition on the definition of patents and copyright. According to Mr. Taylor, the constitutional basis of patent and copyright assumes competition. Competition is a backdrop for copyright issues such as protectability, fair use, and functionality. In the patent context, competition principles underlie claim construction, the doctrine of

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<sup>62</sup> 645 F.2d 1195 (2d Cir. 1981).

<sup>63</sup> 448 U.S. 176 (1980) (recognizing that patentholders can compete in markets for nonstaple goods related to patented inventions without engaging in patent misuse).

equivalents, and requirements of patentability under 35 U.S.C. § 112. The enforcement agencies often participate in legal and legislative debates over changes in patent and copyright law.

### **Dr. David J. Teece**

Professor Teece gave a presentation on "IP, Competition Policy, and Enforcement Issues."<sup>64</sup>

Professor Teece began with a discussion of "patent thickets," areas where multiple firms own multiple intellectual property rights. Patent thickets themselves may be procompetitive when they reflect numerous technological breakthroughs. Professor Teece said that the critical policy question is not whether there are patent thickets, but, instead, whether patent thickets result in technology thickets. If technology thickets do not arise from patent thickets, then firms may be able to circumvent other patents with their own innovations (indeed, the patent thicket may reflect successful efforts to do so).

Professor Teece then turned to the issue of whether intellectual property rights are competitive or complementary. He noted first that many patent thickets involve complex combinations of substitutes and complements. Cross-licensing complementary intellectual property is, according to Professor Teece, unambiguously good; cross-licenses involving substitutes may require additional economic analysis. Even when cross-licenses may involve substitutes, their combination may result in better technology than either set of assets could offer individually.

Professor Teece then discussed "royalty stacking," which occurs when vendors pay royalties to multiple firms to offer a single product. Professor Teece observed that royalty stacking is not unique to intellectual property; the production of most goods and services involves the combination of inputs. Intellectual property may be different from other inputs in two circumstances -- when alternative technologies are not available, and when intellectual property owners are unwilling to negotiate in a socially efficient manner. Hold-outs can frustrate technological progress. But for the most part, licensors and licensees are usually able to resolve any negotiating problems -- the only significant effect may be on transaction costs. As a general proposition, royalty-stacking is not an antitrust issue -- patent owners are generally free to charge whatever royalties their patents will bear in the licensing marketplace.

Professor Teece then turned to the broader question of whether the PTO is issuing overbroad patents and, if so, what policymakers could and should do about it. First, he noted that if the PTO is, in fact, granting overbroad patents, the antitrust agencies have a policy role to play in encouraging reform. But overbroad patent issuances are not an enforcement issue. Moreover, Professor Teece said there were other mechanisms to combat overbroad patents, including (1) interventions during prosecution; (2) *ex parte* and *inter partes* reexaminations; and (3) litigation over validity. Again, problems resulting from less-than-optimal patenting are usually resolved. The only real issue is the cost of remedying the problems.

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<sup>64</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020227davidjteece.pdf](http://www.ftc.gov/opp/intellect/020227davidjteece.pdf).

Professor Teece turned to patent litigation as an antitrust issue. Although litigation may be costly, recent research suggests that the costs are not frequently incurred. Moreover, the threat of litigation is, according to Professor Teece, necessary to encourage negotiated agreements. Settlements in the intellectual property context are usually procompetitive; vigorous antitrust enforcement in the area may prevent firms from negotiating efficient transactions and require them to engage in costly litigation.

Professor Teece next examined "defensive patenting," where firms allegedly incur the cost of seeking patents only because other firms are doing so. Cross-licensing may be an efficient mechanism for reducing the level and need for defensive patenting. But defensive patenting itself may not be a problem that requires a policy solution -- after all, a patent has defensive value only if other firms use the invention, which implies that the invention embodies a technological advance. And even if defensive patenting were a significant policy issue, it would be difficult to identify how patents are "defensive" (vs. how many patents are sought for ordinary commercial benefits).

Professor Teece concluded by saying that although there are some potential inefficiencies in markets for know-how, the historical record suggests that firms are able to resolve their differences and reduce the inefficiencies that are possible under the system. Resolution is more likely to occur when the rules of the game -- including antitrust law and policy -- are reasonably clear.

### **Dr. Carl Shapiro**

At the outset of his remarks, Professor Shapiro suggested that attendees examine his papers on the competitive implications of patent thickets<sup>65</sup> and settlements of patent litigation.<sup>66</sup>

Professor Shapiro began his presentation by saying that antitrust analysis -- whether conducted by lawyers or economists -- usually takes as given the state of intellectual property rights in a given market, then examines competition in view of those rights. Given the changes in the manner that patents are issued, licensed and used, however, Professor Shapiro said that the antitrust enforcement agencies must do more than roll with the punches. They must consider becoming advocates for reform in patent law and the patent system consistent with principles of competition.

Among the most significant intellectual property trends affecting antitrust law are (1) the emergence of patent thickets, resulting from the explosion of multiple patents controlled by multiple firms in the same field and covering the same products; (2) the increasing importance and perhaps necessity of evaluating the validity and scope of patents in antitrust investigations where the parties assert intellectual property rights as a defense; and (3) the increasing number of weak patents, which erodes the presumption of validity and probability of infringement in cases

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<sup>65</sup> See Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting* (March 2001), located at <http://haas.berkeley.edu/~shapiro/thicket.pdf>.

<sup>66</sup> See Carl Shapiro, *Antitrust Limits to Patent Settlements* (May 2001), located at <http://haas.berkeley.edu/~shapiro/settle.pdf>.

where patents are raised as an antitrust defense. Professor Shapiro said that he would address how antitrust policy should respond to each of these three trends.

With respect to the emergence of patent thickets, Professor Shapiro focused on the antitrust treatment of cross-licensing and patent pools. The increasing number of firms with potentially blocking intellectual property rights in markets characterized by patent thickets increases the likelihood that efficient licensing negotiations may not occur. Hold-up during licensing negotiations can delay product improvements and the commercialization of inventions. Cross-licensing, by contrast, facilitates the ability of producers affected by patent thickets to design and produce new products with greater freedom. Antitrust policymakers should therefore encourage the development of cross-licensing agreements and patent pools that enable producers to lower costs and accelerate time-to-market for new products. Professor Shapiro believes that enforcers generally recognize the benefits of cross-licensing and pools. In its investigation of Intel, however, the FTC may have sent the wrong message by challenging Intel's policy of seeking royalty-free cross-licenses with other microprocessor manufacturers. According to Professor Shapiro, the FTC rejected Intel's argument that its policy -- essentially a barter system involving microprocessor patents -- reduced its costs and benefited consumers. Professor Shapiro doubts that the current FTC would bring a similar case today.

Professor Shapiro then turned to how enforcers should evaluate the exclusionary power of patents in antitrust investigations. He cited DOJ's recent antitrust investigation of TV Guide's merger with Gemstar, where the parties claimed that Gemstar's patent portfolio would eventually eliminate TV Guide from the market for interactive programming guides. The parties had been in patent litigation for several years before deciding to merge. According to Professor Shapiro, despite the fact that TV Guide continued to compete during the infringement litigation (allegedly offering indemnification to its customers), the parties contended that the elimination of unlawful (i.e., infringing) competition should not raise issues under the antitrust laws. DOJ staff were reluctant to evaluate the strength of Gemstar's portfolio; nobody really knew whether Gemstar would succeed in excluding TV Guide. Professor Shapiro, DOJ's economic expert, believed that the elimination of competition occurring during the infringement suit may have been sufficient to give rise to an antitrust violation. Ultimately, DOJ declined to challenge the merger.

Professor Shapiro said that similar issues have emerged in recent FTC enforcement actions against patent litigation settlements involving branded and generic pharmaceutical producers. The parties have contended that the agreements do not eliminate competition that would occur in its absence. Professor Shapiro said that in some of these cases, it has not been necessary to evaluate whether the patent was valid or infringed (either because the patent was invalidated or because the settlement, on its face, restricted competition beyond the scope of the patent at issue). In many other investigations, however, it will remain necessary to assess the validity and scope of intellectual property, especially when evaluating patent pool restrictions.

Professor Shapiro then discussed how the increasing number of lower-quality patents could affect antitrust investigations. First, he said that the agencies should not be in the business of challenging patents. Instead, they should focus on investigating potentially anticompetitive agreements involving weak or invalid patents. Although Professor Shapiro acknowledged that patents enjoy a statutory presumption of validity, he suggested that patent rights represent only a

potential right to exclude. The patent itself does not exclude others; its exclusionary power with respect to other firms can only be definitively determined in courts. Measuring this "probabilistic" right to exclude in individual cases will remain challenging.

## **Second Group Discussion**

Commissioner Thomas Leary opened the second group session by discussing whether timeframes under antitrust and intellectual property law are reconcilable. Pointing to antitrust law's forward-looking incipency standard, Commissioner Leary said that antitrust law does not focus exclusively (or perhaps even principally) on static assessments of the marketplace or effects in the marketplace. Patent law is also forward-looking, trading potential anticompetitive effects in the short run for the benefits of innovation in the long run. Both regimes, according to Commissioner Leary, may involve some wishful thinking about the long run and some pessimistic thinking about the short run.

Commissioner Leary then discussed to the broader question of whether antitrust law is sufficiently nimble and progressive to remain applicable to rapidly evolving industries. Although some commentators had expressed skepticism about the continuing relevance of antitrust, more recent commentary reflects a recognition that perhaps the new world is not so different from the old one in which antitrust originated, and that antitrust law and policy have roles to play.

In the context of intellectual property, the principal question, according to Commissioner Leary, is how to strike the right balance between antitrust policy and the need for intellectual property protection. The hearings are designed to accumulate a body of knowledge about intellectual property and its relationship to competition. Although some may ask what antitrust enforcement agencies will be able to do about some of the issues raised in the hearings, Commissioner Leary said that the agencies will use a broader knowledge base to engage in more informed competition-related advocacy. He then asked panelists to provide input on what the enforcement agencies can do with their limited jurisdiction.

Mr. Taylor responded first to Commissioner Leary's about the respective timeframes in antitrust and intellectual property law. He said that his primary concern is overaggressive antitrust policy towards the complex relationships that are often necessary in intellectual property-intensive industries. According to Mr. Taylor, there is always the danger that antitrust enforcement will take a static approach to analyzing the competitive effects of arrangements, devoid of an appreciation of the broader context in which innovation and product development must occur. Mr. Taylor said that policymakers should not forget about the state of the U.S. economy 20 years ago, especially when they challenge domestic firms for monopolization. Commissioner Leary said that antitrust policy today is far different from antitrust policy in the 1970s.

Mr. Nydegger discussed the role of patent portfolios and their effect on competition. According to Mr. Nydegger, the availability of intellectual property protection for smaller firms allows them to assemble portfolios that can facilitate entry and level the playing field. Larger companies require patent portfolios in order to protect their inventions and retain freedom of

design. Mr. Nydegger then questioned whether "anecdotal" evidence of weak patents should affect antitrust enforcement and advocacy. According to Mr. Nydegger, other mechanisms within the patent system may be used to remedy any alleged problems about overbroad or weak patents. He pointed to the PTO's recent business method patent initiatives; he also said that firms are able to challenge weak patents in infringement litigation.

Mr. Weinstein said that the weaknesses in the patent system have particularly adverse effects on smaller companies. Lacking sufficient resources, the PTO is not able to remedy many of the problems in the current system because it must issue patents unless there are reasons not to do so. Litigation is not an effective weapon for overcoming weak patents because of the presumption of validity; alleged infringers must offer clear and convincing evidence to overcome the statutory presumption, a burden that few small companies are willing or able to undertake. Mr. Weinstein recommended that the enforcement agencies adopt a more aggressive role in competition-related advocacy. He also suggested that the FTC use its powers under § 5 of the FTC Act to challenge baseless assertions of patent infringement. More aggressive advocacy and enforcement could protect smaller companies from anticompetitive behavior by larger companies. Mr. Weinstein added that today's Congress is not likely to reform the system.

Although Professor Shapiro agreed that the enforcement agencies should take action in appropriate cases, he said that their focus should be on protecting competition, not on protecting small businesses. He does not believe that the FTC or DOJ should pursue investigations of patent litigation or procurement unless there is strong evidence of bad faith (or fraud) and anticompetitive effects. Nor does he think that the enforcement agencies should challenge unilateral refusals to license. Professor Teece agreed with Professor Shapiro that the agencies should generally avoid investigations of patent infringement litigation itself, especially if the rationale for action would be spotty anecdotal evidence of weak patents. Professor Teece also pointed to the relative paucity of infringement cases (approximately 100 per year).

Mr. Love said that people should draw distinctions between the issuance of patents and the commercial misuse of patents in the marketplace. Patents produce incentives to innovate and disclose information that enables other firms to innovate; dozens of industries have flourished under the current system, discovering inventions that benefit consumers.

Mr. Taylor said that the enforcement agencies should not get into the business of policing bad or weak patents. New technology has been the engine of recent economic growth and industrial leadership in the United States. The patent system will take care of weak or unenforceable patents. The focus of antitrust enforcement in this area should remain commercial agreements between companies; the strength, weakness or commercial significance of intellectual property may be relevant to determining whether competitors have entered agreements going far beyond the scope of any patent rights. But antitrust challenges to patents themselves should, according to Mr. Taylor, remain a relic of previous eras of antitrust enforcement.

FTC staffer Hillary Greene asked whether patent system reform (or antitrust enforcement) would reduce the costs of failure by focusing more on the patent procurement process or on the litigation process. Professor Teece replied that most patent disputes result from

divergent perceptions over the value of intellectual property. Injecting an additional element of uncertainty -- e.g., greater antitrust scrutiny of settlements -- would significantly reduce the incentive and ability of actual or potential litigants to enter efficient licensing transactions or settlement agreements.

Professor Shapiro said that the enforcement agencies have long realized that settlement agreements could raise significant competitive issues. Settlement restrictions should enjoy no presumption that they are in the public interest, notwithstanding the general judicial policy in favor of settlements. Mr. Weinstein said that for every patent infringement case that goes to trial, between 50 and 100 settle. If those settlements involve invalid patents, they represent a tax on the public.

Mr. Nydegger said that the PTO requires more resources to perform more efficiently. The diversion of resources from the PTO to general appropriations has increased the pendency of patent applications and uncertainty in the process. Mr. Aharonian said that industry, working with the PTO, can resolve many of these issues, but each generation inevitably confronts or creates new problems in the patent system.

Mr. Mejia said that Stanford University faces somewhat unique constraints when it decides to litigate or license. It has sued only three companies over the past 30 years for patent infringement. Stanford does not really compete in any relevant market, making cross-licenses less useful to Stanford than to firms competing in commercial markets. Even patentholders like Stanford, however, can face enormous pressures to settle. Litigation costs are high; judges often do not want to handle infringement cases and fear reversal in the Federal Circuit.

Ms. Greene thanked participants for their contributions and closed the session.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of "Independent Inventor Perspective  
on Patents" and "Economic and Other Perspectives on Patent  
Standards and Procedures"

February 28, 2002  
Morning Session

The Federal Trade Commission and Department of Justice began their fourth day of hearings on the implications of competition and intellectual property law and policy in Berkeley, California by focusing on the independent inventor perspective on patents and economic and other perspectives on patent standards and procedures. Panelists included:

- **Joseph Farrell**, Professor of Economics, University of California, Berkeley, and Chair, Competition Policy Center.
- **Justin Hughes**, Visiting Professor of Law, University of California, Los Angeles.
- **John Love**, Director, Technology Center 2100, Patent and Trademark Office.
- **Robert P. Merges**, Wilson, Sonsini, Goodrich & Rosati Distinguished Professor of Law and Technology, Berkeley Center for Law & Technology, University of California, Berkeley.
- **Lawrence J. Udell**, Executive Director, Intellectual Property International, Ltd.

Below are summaries of individual presentations and group discussion.

### **Independent Inventor Perspectives on Patents**

Mr. Lawrence Udell gave a 30-minute presentation on the importance of patents to independent inventors. Over the course of his career, he has created 22 corporations based on inventions; none ever went bankrupt. Mr. Udell also teaches courses on New Ventures and Entrepreneurship, and has lectured extensively before the PTO and WIPO.

Mr. Udell turned to statistics on the increasing number of patents in the United States. In 1820, the PTO issued only 1,998 patents; by 1870 it issued 117,310 patents; in 1959, the figure had dropped to 52,408; by 1994, the figure had rebounded to 101,676; in 2001, the amount had increased to 166,045. Inventors come from every segment of society and span all ages. According to Mr. Udell, most independent inventors are driven by the quest for money; patents represent perhaps the only route to independent wealth in today's economy. New channels of distribution, such as QVC, increase the ability of independent inventors to obtain market access and commercial success.

Mr. Udell then examined the composition of the top ten patentholders from 1969 to 2001, noting the declining presence of American corporations among top U.S. patent owners. Independent inventors, according to Mr. Udell, are increasingly important in maintaining economic growth and innovation in the U.S. He cited the example of Jim Ferguson, the inventor of liquid crystal display technology and holder of 150 U.S. patents. LCD technology, employed in a variety of devices, created approximately 500,000 jobs in the United States.

Absent patent protection, independent inventors would not have much incentive to innovate. Mr. Udell wondered where new companies, products and jobs would originate in the absence of intellectual property protection. Small businesses, an engine of job creation in the United States, would suffer more than any other sector from the elimination of patent protection.

Licensing is another lucrative channel for independent inventors who are either unable or unwilling to commercialize their own inventions. IBM has demonstrated that licensing on a large scale can generate significant revenues -- IBM's patent royalties have increased from \$30 million to \$1.6 billion per year since it decided to license its innovations more widely to others.

Mr. Udell concluded by reemphasizing the importance of patents to small inventors. He cited the Wright brothers' invention of the first airplane as one among many examples of the impact that independent inventors can have on innovation.

FTC staffer Bill Cohen asked how Mr. Udell would improve the patent system. Mr. Udell replied that he would prevent Congress from diverting funds from the PTO to general appropriations; higher PTO funding would reduce the pendency periods for applications.

FTC staffer Michael Barnett asked how the patent process might differ for independent inventors. Mr. Udell replied that many independent inventors require assistance from colleges, inventor organizations and consultants to complete their applications and negotiate the PTO's process. Independent inventors also require access to capital; although the venture capital community has become tighter over the last year or two, billions of dollars are available outside the venture capital community from "angel investors." Mr. Udell said that aggressive FTC consumer protection enforcement against fraudulent inventor organizations has been helpful.

### **Economic and Other Perspectives on Patent Standards and Procedures**

FTC staffer Bill Cohen opened the second morning session by introducing the panelists. He said that the focus of the panel would be a more detailed examination of patent standards and procedures.

#### **Robert P. Merges**

Professor Robert P. Merges gave a presentation on "Patent Standards and Procedures," which summarized current legal and economic literature and discussed prospects for reform.<sup>67</sup>

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<sup>67</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020228robertpmerges.pdf](http://www.ftc.gov/opp/intellect/020228robertpmerges.pdf).

The principal standards of patentability are novelty, utility and nonobviousness; these requirements are designed to be gatekeepers to insure that exclusive and exclusionary rights are not given to applicants who have not invented something socially beneficial.

A key procedural feature of the U.S. patent system is its mechanism for determining priority. In many other jurisdictions, the first to file for a patent is usually the party that receives it, even if another party had invented it first. In the U.S. system, subsequent applicants can receive patents if they prove that they were the first to create the invention at issue. Other key procedural issues that have given rise to debate include (1) optimal examination; (2) whether registration would be sufficient; (3) whether we should have an opposition system; and (4) whether we need to reform the PTO by increasing salaries and creating internal incentives for efficient and higher quality patenting.

Professor Merges then discussed some of the classical literature on the nature and function of patent systems. John Stuart Mill, the 19<sup>th</sup> century British political philosopher, emphasized the utility requirement for patentability. The term and scope of protection should depend on the amount of utility provided by the invention. According to Professor Merges, however, Mill did not define his utility standard with any specificity.

Over 100 years later, Fritz Machlup and Edith Penrose concluded that the U.S. patent system was creating significant administrative costs and had suffered a declining standard of patentability; too many firms were spending too much money on receiving patents for inventions that were not innovative. Michael Polyani, writing in 1944, thought that the test for invention was too difficult, and that patents should be replaced with rewards and compulsory licensing.

In 1958, Fritz Machlup offered more elaborate conclusions in his "Economic Review of the Patent System," produced for the Senate Judiciary Committee. Machlup focused on the implications of the patent system for innovation and small companies, contending that the "nature of invention" is ultimately less important than the process of innovation. Matching the reward from patents with the level of risk does not require precision for the patent system to achieve important economic objectives. In 1984, Machlup said that although it may be impossible to quantify the total costs and benefits of the patent system, it is possible to identify the marginal benefits and costs of changing the duration, scope or strength of patent protection.

In 1966, Edmund Kitch offered another standard for patentability. According to Kitch, patents should not be granted unless the patented innovation would not have been developed in the absence of patent protection. Other advocates of this "but for" standard include S.C. Gilfillan and Michael Scherer.

Professor Merges then described his own conclusions about standards of patentability, first articulated in a 1992 article. According to Professor Merges, the patent system has a greater effect on the incentive to develop commercial inventions than on the incentive to invent. Very high-cost research should perhaps enjoy lower standards for patentability (specifically, the standard for nonobviousness should be lower for high-cost research). Professor Merges' model attempts to link technical merit with other economic variables, especially cost.

In 1998, Ted O'Donoghue suggested that varying the standard for patentable inventions can influence rewards to pioneers and improvers. Higher standards of patentability induce larger quantum innovations, which may increase the incumbency of pioneers and enhance the reward for innovations. But Professor Merges noted that higher standards for nonobviousness reduce the profitability of follow-on innovations by improvers and may, therefore, reduce the profitability of pioneers (because pioneers often benefit from follow-on innovations by other firms).

Professor Merges then turned to literature on patent procedures. In an early and influential critique of patent procedures, Alfred Kahn contended that the basic problem with the patent system was the cost and complexity of assigning individual rights in an era of large-scale collective and corporate invention. Kahn concluded that the patent system favored "the powerful and the unscrupulous." For example, Kahn contended that applicants routinely amended pending claims to capture innovations offered by rivals. According to Kahn, Professor Merges noted that Kahn wrote his article before the patent laws were amended to begin patent terms on the date of filing; the amendments reduced the range of strategic behavior that Kahn alleged in his article.

Professor Merges also discussed the literature on petty patents, which are designed to confer exclusive rights for less significant inventions. Petty patents give rise to a two-tiered system of protection, separating more significant innovations from mere commercial novelties. Obviously, the process of seeking petty patents is considerably less expensive. Professor Merges noted that a petty patent system might conflict with the Jeffersonian ideal of an egalitarian patent system, which confers the same rights upon large and small inventors.

Professor Merges then turned to the literature on incentives within the PTO. In a 1999 article, Professor Merges cited literature on personnel economics to suggest the adoption or alteration of incentives of PTO employees to produce better-quality examinations. Professor Merges also proposed an opposition system, which would permit third parties to object to the issuance of certain patents. According to Professor Merges, an opposition system would improve examinations by enabling interested and informed parties to provide information that might otherwise be unavailable to or undiscovered by examiners. He noted that others have criticized an opposition system as an inadequate measure to reform the patent system. Professor Merges also pointed out that others, including Professor Mark Lemley, have suggested that litigation may be a sufficient remedy for any flaws in the patent application process. According to Professor Lemley, very few patents merit detailed scrutiny; imposing more significant obligations on the PTO and applicants could produce significant costs without creating any incremental benefits.

Professor Merges then discussed a number of other new proposals for procedural reform of the patent system. Some, including Professor Scott Kieff, have proposed a return to a registration system, which would eliminate examination altogether. Others, including Professor Jay Thomas, have proposed that the PTO pay bounties to prior art informants assessed against applicants. Noncompetitors of patentholders may not have the same opportunity or incentive to challenge weak patents with prior art either through reexaminations or infringement litigation; bounties may enhance their incentives. Professor Merges also said there is a growing consensus

to address the social welfare gap between private benefits from licensing and settlement agreements and the public cost of invalid patents.

Professor Merges then turned to empirical studies of patent systems. Assessing 150 years of global trends in patent procedures, Professor Josh Lerner suggests that patent systems have generally found ways to adapt to information asymmetries between government and private actors. Adaptive mechanisms have included greater discretion for applicants and a clearer division of labor between patent offices and courts. Professor Lerner contends that regulators can offer a "menu of incentive contracts" allowing patent offices to discriminate between applications of different quality. Professor Mark Lemley and John Allison note that an increasing number of prior art references and longer prosecution periods suggest that applications are receiving greater scrutiny at the PTO. In a recent empirical study of PTO examiners, Ian Cockburn, Sam Kortum and Scott Stern conclude that patent quality is declining, examiner experience and workload are not correlated with validity rates, and more generous examiners tend to work on patents that are cited more often (but suffer higher invalidity rates).

Professor Merges said that although lawyers and economists have done a lot of basic research on patents and procedures, there needs to be more conceptual development exploring the implications of the basic research.

### **Joseph Farrell**

Professor Farrell gave a presentation entitled "Competition and IP."<sup>68</sup>

Professor Farrell began by describing two benefits of the hearings for antitrust enforcement agencies: (1) better competition advocacy with respect to intellectual property policy, and (2) better antitrust enforcement when intellectual property is relevant.

Professor Farrell articulated four basic principles that could guide competition-related advocacy with respect to intellectual property policy. First, more intellectual property is not always better. According to Professor Farrell, it may not even increase innovation. A single steward of innovation in a relevant market may not have sufficient incentive or imagination to produce socially optimal outcomes.

Second, intellectual property can be a costly way to encourage innovation. In a static economic model, intellectual property can result in monopoly mark-ups that may not exist in the absence of protection. The level of markup depends on the nature and number of substitutes. Moreover, intellectual property rights may confer veto rights over subsequent innovations. Although intellectual property may increase incentives to innovate, it has costs that should be recognized. Policymakers should also acknowledge that there may be other incentives to innovate that can be stronger than the prospect of intellectual property protection.

Third, the level of intellectual property should be used judiciously. According to Professor Farrell, perhaps there should be less protection where there are few competitive

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<sup>68</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020228josephfarrell.pdf](http://www.ftc.gov/opp/intellect/020228josephfarrell.pdf).

alternatives, or where obvious lines of development remain open, or where network effects are important. In other contexts, more protection may be necessary to promote innovation.

Fourth, policymakers should evaluate the patent system as a whole. Reforming the PTO would not be a complete solution. In fact, it may increase the costs of the system. Policymakers should also seek ways to minimize the delay and cost of litigation, especially for smaller companies. Perhaps they should also be skeptical that litigation will solve all of the flaws in the procurement process efficiently. Policy should also minimize the infringement of "good" intellectual property and the enforcement of "bad" intellectual property. Policymakers should also be conscious of the incentives and opportunity to adduce information. This is especially important in examining the timing and costs of application, publication, search and opposition. It is also important for policymakers to recognize that private firms may not have sufficient incentives to challenge the validity of intellectual property when they are unable to internalize all of the social benefits from their challenge; other firms (and the public) may benefit from invalidations even when they incur no costs in challenging invalid patents.

Professor Farrell then turned to the second benefit of the hearings: improved antitrust enforcement when intellectual property is relevant. He discussed four specific issues: (1) whether one must assess intellectual property to resolve antitrust questions; (2) whether enforcers should treat intellectual property like other forms of property; (3) complementarity and horizontality of intellectual property; and (4) the role of scale in innovation.

Professor Farrell believes that the agencies are "rightly reluctant" to assess the strength of intellectual property in investigations. Instead, they should be able to use actual behavior in the marketplace to gauge the likely validity and scope of intellectual property (e.g., indemnification clauses for customers). Professor Farrell also said that settlements could enhance market power and give rise to mischief that should trigger antitrust concern.

Professor Farrell then discussed whether intellectual property should be treated like other forms of property. He cited the recent appellate decision in *United States v. Microsoft Corp.*,<sup>69</sup> holding that intellectual property rights do not confer antitrust immunity for restrictive licensing provisions. The D.C. Circuit drew an analogy to the owner of a baseball bat who claimed that his property rights entitled him to commit torts. But Professor Farrell cautioned that intellectual property possesses attributes that should not be ignored by the enforcement agencies.

Professor Farrell turned to how enforcers should decide whether intellectual property is complementary or competitive. Over the long run, some complements can become substitutes. For example, middleware evolved to become a potential platform for challenging operating systems. It remains an open question on how the agencies should evaluate intellectual property bundles containing both complements and substitutes.

Professor Farrell concluded his presentation by discussing the relationship between scale and innovation. Although scale makes innovation cheaper as a means to offer surplus, market power can reduce the incentive for firms to pass the surplus onto consumers. In merger

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<sup>69</sup> 253 F.3d 34 (D.C. Cir. 2001).

investigations, enforcement agencies should ask why either of the merging firms could not achieve scale through making better products for consumers rather than through consolidation. Scale is not necessarily an exogenous variable. Finally, Professor Farrell noted that licensing can sever the link between firm size (of the innovator) and the scale of IP exploitation.

### **Justin Hughes**

Professor Justin Hughes opened his remarks by saying that although it is useful to discuss proposals for PTO reform, most have absolutely no chance of being implemented, even if they are appealing to others inside and outside the patent bar. He recounted a discussion with an antitrust lawyer who asked what economic criteria PTO examiners used in issuing patents. Professor Hughes said that the vision of examiners employing economic criteria (in addition to the criteria they use today) is a scary thought even for those not opposed to government regulation. A modest but more realistic approach is to discuss what reforms are likely to occur at the PTO in the foreseeable future.

Professor Hughes said that the PTO's workload is daunting, but has recently improved. Just as the boom of the 1990s was good for the PTO, so too is the recent downturn. Attrition rates have declined, stabilizing and improving the knowledge base of examiners. And although the PTO benefited as an agency from the increasing focus of the business community on intellectual property (evidenced by the upswing in CEO and COO requests for books on intellectual property and licensing), attention quickly gave way to scrutiny from others not especially impressed by the explosion in patents.

According to Professor Hughes, the PTO was a principal contributor to the increasing imbalance between antitrust and intellectual property. Although it is true that the PTO must follow Federal Circuit precedent in determining the range of patentable subject matter, it is also important to remember that the PTO issued the patents that give rise to Federal Circuit decisions that seemingly expand patentable subject matter. Professor Hughes said that it is unrealistic to expect the PTO to scale back the explosion of patents -- patent professionals become "property-intoxicated," leaving questions of competition to others.

Professor Hughes believes that the most fertile ground for sensible reform is reexamining the range of patentable subject matter, particularly software and business methods. Some recent trends suggest that the PTO is taking steps in the right direction. The business method patent initiatives that began in 2000 seem to be resulting in fewer applications and lower allowance rates. The sophistication of patents may be increasing. Providing second-review examinations in the business method area has also been useful, though it may be inconsistent with Article 27 of the TRIPS requirement (which requires that all fields of technology be treated the same for purposes of intellectual property protection). According to Professor Hughes, however, U.S. business method patents are here to stay. The Europeans are taking a noticeably different approach, restricting software patents to inventions that make technological contributions to processes. Early data suggest that the European approach has significantly reduced the number of software and business method patents; the United States issues approximately twice as many patents in the field.

Professor Hughes then discussed whether and how standards for patentability should be adjusted. Although it may be superficially appealing to limit patents to inventions that would not exist in the absence of protection, it would, as a practical matter, be almost impossible to administer. Even less significant adjustments are more difficult than they appear and would conflict with a one-size-fits-all patent model. Putting aside international treaty obligations, special rules for different industries would suffer from two major deficiencies: (1) the law cannot adjust quickly enough to respond to new and distinct technological developments, and (2) people and companies affected by the law may have a very difficult time adjusting to new standards.

### **Discussion Session**

FTC staffer Bill Cohen asked how much discretion the PTO enjoys over standards and procedures. Mr. Love replied that the PTO undertakes internal initiatives to improve the speed and quality of examinations, but has very little discretion. Patents must be issued unless the PTO finds reasons why they should not be granted. Decisions from the Supreme Court and Federal Circuit determine the standards of patentability and have expanded the range of patentable subject matter. Ray Chen from the PTO agreed that the PTO is compelled to carry out its statutory mandates; even when the PTO has attempted to restrict the range of patentable subject matter, the Federal Circuit has forced it to reverse course. The Federal Circuit is also increasingly constraining the PTO's ability to reject applications for obviousness.

Professor Merges said that the primary policymakers are Congress, the Federal Circuit and the Supreme Court. Intellectual property issues are beginning to appear more frequently in certiorari petitions to the Supreme Court; the Supreme Court may be more receptive than the Federal Circuit to some of the more policy-driven arguments and issues discussed during the hearings. It may also be willing to hear arguments that the Federal Circuit has deviated from Supreme Court precedent on nonobviousness.

Bill Cohen asked how the patent system should deal with mechanical inventions that largely arise from repeated trial and error; under a "but for" standard, the invention seems inevitable in the absence of patent protection. Mr. Love replied that the current tests for invention are sufficient. Introducing economic tests into the examination process would be difficult and create enormous uncertainty. Professor Farrell said that firms may seek to patent such inventions because they are concerned that others may do so; the risk and cost of potential litigation may exceed the cost of seeking patents even for mundane inventions. Professor Hughes said that a petty patent system could address such concerns at a lower cost to the government and the applicant. A two-tiered system of protection could also improve the application of the nonobviousness standard to applications seeking fuller protection. Professor Hughes believes that a petty patent system might also attract political support from the patent community.

Professor Merges said that one of the most important policy concerns in the patent field is potential collusion between patentholders and firms with information (i.e., prior art) that could undermine the validity of their patents. Professor Merges is not sure whether antitrust or patent law can constrain agreements to withhold prior art from third parties. Section 135 of the patent

law only covers settlements of patent interferences; the Sherman Act may not reach agreements limited to the withholding of information. But the social and economic consequences of such agreements may be significant. Professor Merges said that another horizon issue might be emerging economic theory showing that competitors may have the incentive to destroy the patentability of a rival's inventions.

Bill Cohen asked the panelists to address issues arising from the doctrine of enablement. Professor Merges provided context before answering the question. The enablement doctrine constrains the breadth of claims by preventing the applicant from receiving patents for claims that he did not discover and disclose to the public. As a policy matter, permissive enablement doctrine could allow pioneer patentholders to receive exclusive rights to a broad number of applications that improvers may discover. In predictable arts, where the nature of innovation is more predictable, it may be preferable to provide broader scope of coverage to the pioneer. In less predictable arts, narrower coverage for the pioneer could result in more downstream innovation by improvers, who could engage in more noninfringing R&D. Professor Merges added, however, that a more restrictive enablement doctrine may impose socially undesirable costs on pioneer patentholders by encouraging them to spend more time reducing initial innovations to practice instead of spending more time on other projects.

Bill Cohen asked whether panelists thought that patent law should, like copyright law, have a fair use defense for certain types of literal infringement, such as pure research. Professor Merges responded that there is a strong economic case for permitting certain infringements under patent law if the fair use defense was framed clearly and appropriately. Because it is unlikely that any fair use legislation would pass, Professor Merges believes that the Supreme Court would have to create the defense. Professor Farrell said that the answer depends on whether the absence of a fair use defense is preventing socially beneficial research (and, if so, why). It would be useful to understand what factors, if any, prevent patentholders from providing licenses to researchers.

Mr. Cohen thanked the panelists for their contributions and closed the session.

## **FTC/DOJ Hearings on the Implications of Competition and Intellectual Property Law and Policy**

ABA Antitrust Section Summary of "Business Perspectives  
on Patents: Hardware and Semiconductors"

February 28, 2002  
Afternoon Session

The Federal Trade Commission and Department of Justice concluded their hearings on the implications of competition and intellectual property law and policy in Berkeley, California by focusing on perspectives on patents in the hardware and semiconductor industries. Panelists included:

- **Robert Barr**, Vice President, Worldwide Patent Counsel, Cisco Systems, Inc.
- **Peter N. Detkin**, Vice President, Legal and Government Affairs and Assistant General Counsel, Intel Corporation.
- **Stephen P. Fox**, Associate General Counsel and Director, Intellectual Property, Hewlett-Packard Company.
- **Bronwyn H. Hall**, Professor of Economics, University of California, Berkeley.
- **Julie Mar-Spinola**, Chief Litigation and Intellectual Property Counsel, Atmel Corporation.
- **Joel Poppen**, Director, Patent Litigation and Licensing, Micron Technology Inc.
- **Desi Rhoden**, President and Chief Executive Officer, Advanced Memory International, Inc.
- **Frederick J. Telecky, Jr.**, Senior Vice President and General Patent Counsel, Texas Instruments.

Below is a summary of individual presentations and group discussion.

### **Opening Remarks and Introductions**

Susan DeSanti introduced the panelists and explained that discussion would focus on the perspective of hardware and semiconductor manufacturers on the patent system and its impact on innovation.

## **Bronwyn H. Hall**

Professor Hall discussed her research on the impact of the patent system on the semiconductor industry (conducted in collaboration with Professor Rosemarie Ziedonis).

Industry surveys on patents revealed that semiconductor manufacturers generally did not believe that patent protection was an important factor in their business; factors like manufacturing know-how were more significant. Data on semiconductor patents from 1985-1995 told a different story; patents per dollar of R&D had doubled in the industry. Professors Hall and Ziedonis conducted their own survey of semiconductor manufacturers to explore this apparent inconsistency. Responses were almost uniform: industry participants sought more patents because they felt increasingly threatened by the use of patents by others to shut down operations -- a particularly expensive and provocative threat for semiconductor manufacturers.

Two particular episodes persuaded semiconductor manufacturers to intensify patenting of their R&D. First, semiconductor manufacturers said they became alarmed by Texas Instruments' aggressive use of its intellectual property. Manufacturers felt like they required their own IP to engage in bartering and cross-licensing. Second, Polaroid's successful infringement suit against Kodak resulted in a very costly injunction for Kodak; comparable relief against semiconductor manufacturers would be catastrophic because of the high costs of shutting down manufacturing facilities.

The semiconductor industry is now characterized by a system of Mutual Assured Destruction, in which firms have become reluctant to commence infringement litigation because of the high likelihood of infringement counterclaims and the possibility that both firms would have to shut down their operations. Patents are protective measures, obtained largely for defensive purposes.

## **Peter N. Detkin**

Mr. Detkin gave a presentation entitled "A Semiconductor Patent Survey."<sup>70</sup>

Mr. Detkin began by describing how Intel determines what it should patent. Intel's criteria include: (1) patentability; (2) relationship to current or future business; (3) whether the invention is a significant improvement over current designs and/or methods; (4) ease of designing around the invention; and (5) ease of detection (factors include relationship to business of competitors and ability to police infringement). If these criteria are not satisfied, Intel would prefer to maintain its invention as a trade secret.

Mr. Detkin then discussed how many patents are sufficient for a business like Intel. Intel currently possesses approximately 5,500 U.S. patents covering a variety of inventions, including innovations not related to semiconductors. For example, Intel has three times more patents on operating systems than Microsoft owns. The cost of obtaining patents can be a significant factor

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<sup>70</sup> His presentation may be found at [www.ftc.gov/opp/intellect/020228peterndetkin.pdf](http://www.ftc.gov/opp/intellect/020228peterndetkin.pdf).

in determining how many to seek; there is a trade-off between the quantity of patents that businesses obtain and the overall quality of their portfolio.

Mr. Detkin then described the "patent thicket" in the semiconductor industry. Mr. Detkin said that Texas Instruments precipitated the industry-wide proliferation of patents. According to Mr. Detkin, there are over 90,000 microprocessor patents held by over 10,000 parties and 420,000 semiconductor patents owned by over 40,000 parties. Design houses, such as Rambus, ARM, and Qualcomm, are also proliferating. The explosion in patents has resulted in unavoidable overlaps of intellectual property.

Mr. Detkin then discussed how firms can use their intellectual property. First, they can license their patents. Second, they can enforce their patents through infringement litigation. Third, they can do nothing, and if other firms behave similarly, inertia can give rise to *de facto* royalty-free cross-licensing. Among the factors in the licensing decision are what claims the licensee can assert against the licensor; what claims the licensor can use against the licensee; and whether or not a license would affect competition in an industry where product life cycles are short and innovation proceeds at breakneck speed. Intel creates a two-by-two matrix to determine whether to license, cross-license, or litigate. Firms with no patents and no revenues are generally irrelevant. Firms with a lot of revenues and few patents are litigation targets. Firms with many patents and a lot of revenues are potential cross-licensees. Firms with a lot of patents and no revenues -- "trolls" -- generally mean trouble. Unlike industry participants, trolls are not threatened by the potential shutdown of operations and are not incurring infringement damages with products in the marketplace.

Mr. Detkin then discussed whether concerns about industry-wide cross-licensing are warranted. According to Mr. Detkin, the conventional wisdom -- that big companies with large patent portfolios will cross-license each other to the detriment of new entrants -- ignores the asymmetry of risks between incumbents and potential entrants. Mr. Detkin said that a small firm needs only a few patents to put a large firm's significant revenue stream at risk; they are more than happy to obtain licenses from larger companies in exchange for royalties. The result is that large firms such as Texas Instruments, IBM and Lucent tend to use patent portfolios to generate licensing revenue, not to exclude competition.

Mr. Detkin then discussed the "looming problem" of "trolls." The increasing number of distressed companies with intellectual property has only exacerbated the problem. Entities such as Techsearch have been formed for the sole purpose of acquiring and asserting intellectual property. Because they do not participate in relevant markets, they are not vulnerable to infringement counterclaims. But they can assert multibillion dollar infringement claims against larger firms like Intel, along with the threat of catastrophic injunctive relief. Such claims and risks are especially outrageous when the patentholder is not contributing to the public welfare by practicing its own invention. Legislative relief is necessary to prevent the threat of trolling and injunctive relief from becoming a reality.

**Robert Barr**

Mr. Barr began his presentation<sup>71</sup> by discussing Cisco's growth and its relationship to intellectual property. From 1984 to 1993, Cisco filed only one patent application; by 1994, it had reached \$1 billion in revenues, driven largely by competition, not by intellectual property. In 1994, however, Cisco recognized that it may need to seek patents for defensive purposes. It applied for six patents. Now, Cisco files for approximately 750 per year.

Innovation is unquestionably essential for technological progress and commercial success. But patents are not necessary for innovation to occur, whether at Cisco or at other firms in the computer hardware industry. Product development and time-to-market are more important competitive differentiators. Even though Cisco files for patents, nobody at Cisco asks whether an invention is patentable before investing in its development (though it is necessary to check whether the development would infringe patents owned by others).

The hardware and semiconductor industries face significant risks of hold-up by intellectual property owners after introducing products to the marketplace, especially when those products are successful. Even diligent assessments of infringement may not provide sufficient assurances that subsequent infringement suits will not arise. The sheer number of patents makes certainty impossible; the threat of treble damages for willful infringement reduces the incentive of commercial developers to conduct patent searches. Although additional, defensive patenting only exacerbates the problem, Cisco believes it is necessary for commercial survival.

Unfortunately, even defensive patenting is costly, diverting time and resources from product development. True, patent protection enables Cisco and other firms to prevent others from copying key product features, but the scope of protection required in the hardware and semiconductor industry is significantly lower than the level required by pharmaceutical companies. Even seemingly useful patents are becoming less valuable because of longer pendency periods at the PTO and the increasing presence of "trolls" who own patents but do not practice them. They are not vulnerable to defensive patent enforcement. Trolls have the incentive and ability to obtain licensing fees that fall slightly below the cost of litigation; contingency fees for infringement counsel and the growth of patent mining consultants only exacerbate the problem.

Although patents can be useful when they are necessary to encourage innovation and disseminate information to the public, the costs of litigation, the high probability of infringement and the availability of other incentives to innovate make its utility highly suspect in some industries.

Mr. Barr added that intellectual property is unfortunately becoming a subject of increasing dispute in standard-setting bodies. Even royalty-free solutions can result in paralysis.

### **Joel Poppen**

Mr. Poppen opened his remarks by providing some background on Micron, a manufacturer of semiconductors and memory solutions. Micron has 6,6000 U.S. patents,

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<sup>71</sup> Remarks from Mr. Barr may be found at [www.ftc.gov/opp/intellect/barrrobert.doc](http://www.ftc.gov/opp/intellect/barrrobert.doc).

receiving 1,643 in 2001. Its businesses are capital-intensive -- the cost of fabrication facilities in the semiconductor industry averages approximately \$2 billion.

Unfortunately, the proliferation of patents in the semiconductor industry has resulted in a patent thicket -- a web of intellectual property overlaps that creates infringement traps for all producers. Semiconductors are complex products that read upon hundreds and perhaps thousands of patents. Cross-licensing between manufacturers is a necessary and efficient practice, consistent with the antitrust objectives of encouraging innovation and fostering competition.

But cross-licensing does not resolve all of the patent-related issues that manufacturers face. The increasing ubiquity of nonmanufacturing IP owners in the semiconductor industry substantially increases the likelihood of hold-up. Flaws in both the procurement process and the litigation system give these IP owners inappropriate leverage to extract disproportionately high portions of manufacturer revenues in the form of extortionate royalties.

Mr. Poppen then discussed three specific practices that create pressure on semiconductor manufacturers. First, the threat of injunctive relief is incredible leverage against manufacturers. The cost of closing operations and facilities can be catastrophic. Manufacturers must either pay ransom royalties or put their business risk. Patent development companies and patent mining consultants have only accelerated the growth of nonpracticing IP owners willing to exercise leverage over semiconductor manufacturers.

Second, some firms engage in "patent stalking," taking advantages of flaws in the patent procurement system. Such firms monitor developments offered by firms or the industry, then prolong the prosecution process and tailor claims to cover a target's products. If and when the product achieves commercial success, the owner asserts tailored claims against unsuspecting manufacturers. Mr. Poppen specifically cited the problems associated with continuation patents, perfected to an art by Jerome Lemelson and epitomized by the assertion of his patents over bar codes.

Third, firms may ambush the standard-setting process by failing to disclose patent rights they subsequently assert against firms that have adopted standards that would infringe their intellectual property rights. This is particularly problematic when a firm has applied for patents; even diligent searches would not reveal the potential for infringement. Mr. Poppen noted examples involving PINs for ATMs, Dell's assertion of patents over the VL Bus standard, and Unocal's assertion of patents over CARB gasoline.

Hold-up has adverse effects on market participants. First, it results in a shift in R&D investments from product developers to firms engaged in patent generation and royalty extraction. The public does not benefit. Second, royalty-stacking exacerbates the hold-up problem by forcing consumers to bear part of the cost of hold-up. Third, innovative domestic firms have greater incentives to move some or all of their sales and manufacturing outside the United States.

Mr. Poppen then discussed potential solutions. The most significant reform would be the creation of a rebuttable presumption of no irreparable harm to "non-practicing" patentholders. This would significantly reduce the threat of injunctive relief and focus attention on the merits of infringement allegations. Patentholders may still have latitude to overcome the presumption of no irreparable harm. With respect to patent stalking, Mr. Poppen discussed a variety of solutions, but did not think any would be sufficient. Although enhancing the doctrine of laches would be useful, it would not be enough. Finally, Mr. Poppen said that the FTC and DOJ should continue to pursue appropriate antitrust enforcement against patent ambushes in the standard-setting context.

### **Stephen P. Fox**

Mr. Fox opened his remarks by pointing attendees to a written statement that he had prepared for the hearings.<sup>72</sup> He noted at the outset that Hewlett-Packard, like many other high-technology companies, is well aware that innovation is essential to commercial success, and that competition drives innovation. Patents can also be useful in preventing other firms from free-riding on significant commercial inventions and reducing the risk of hold-up.

The patent system, however, has serious deficiencies that are having an adverse effect on multiple marketplaces. There has been a vast proliferation of "an unknown but undoubtedly significant number" of bad patents issued by the PTO, resulting in frequent and protracted litigation over validity and scope. The threat of inadvertent infringement and the inevitability of expensive, protracted litigation can be a serious drag on technological progress.

Mr. Fox then said that the enforcement agencies should embrace a new role of participating as amici in appropriate patent cases with competition implications. Among the issues that the agencies should continue to monitor are the doctrine of equivalents, estoppel, misuse, laches, and the role of juries in patent litigation.

Mr. Fox then discussed the Antitrust Guidelines for the Licensing of Intellectual Property (IP Guidelines). Although they are a vast improvement over the Nine No-Nos of the 1970s, the Guidelines require clarity in several areas where antitrust law has become murkier over the past five years. Antitrust liability for unilateral refusals to license or sell patented goods remains unclear, especially after conflicting decisions from the Ninth<sup>73</sup> and Federal<sup>74</sup> Circuits. Similarly, although the D.C. Circuit's decision in *United States v. Microsoft Corp.*<sup>75</sup> held that intellectual property owners do not enjoy antitrust immunity for licensing restrictions, it did not articulate clear standards for determining when restrictions violate the antitrust laws. Mr. Fox also said

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<sup>72</sup> Mr. Fox's written statement can be found at [www.ftc.gov/opp/intellect/020228stephenpfox.pdf](http://www.ftc.gov/opp/intellect/020228stephenpfox.pdf).

<sup>73</sup> *Image Technical Services v. Eastman Kodak Co.*, 125 F.3d 1195 (9<sup>th</sup> Cir. 1997) (intellectual property owners enjoy only a presumptive business justification for refusing to sell patented goods which may be overcome with evidence of pretext).

<sup>74</sup> *In re Independent Service Organizations Antitrust Litigation*, 203 F.3d 1322 (Fed. Cir. 2000) (patentholders enjoy antitrust immunity for unilateral refusals to license or sell patented goods).

<sup>75</sup> 253 F.3d 34 (D.C. Cir. 2001).

that a number of novel restrictions -- such as a licensor's demand that its licensees not sue it for infringement in any business -- require further study by the agencies.

Other practices may merit further antitrust study. Patent pools are unquestionably important for disseminating technology and opening access. But a one-size-fits-all approach to licensing may be unnecessary and inappropriate for some licensees. Not every market participants necessarily requires intellectual property in a package license. Similarly, a one-size-fits-all approach may be inappropriate in the standard-setting context. Mr. Fox noted that some participants had refused to disclose licensing terms because of alleged antitrust concerns; Mr. Fox believes that patentholders simply want to avoid lower royalties that may result from greater transparency.

Mr. Fox concluding by suggesting that the agencies play a role in harmonizing divergent intellectual property standards across the world.

### **Group Discussion**

Mr. Frederick Telecky said that Texas Instruments does not have any major problems with today's patent system. Although there are problems in the system, such as the leverage of nonproducing trolls, reforms of the system may create costs that exceed any benefits. Moreover, even nonproducing trolls may have contributed to technological progress with their inventions; they should not go unrewarded. By and large, the U.S. patent system prevents free-riding, permits market access for smaller firms, and redresses some of the cost imbalances that result from production in lower-wage countries.

Ms. Julie Mar-Spinola said that policymakers need to reconcile patent law, practices and policy. Although antitrust law is valuable, patents will continue to be issued and they will remain a fact of commercial life. Both fields require some moderation. Ms. Mar-Spinola said that the use of patent portfolios as a revenue-generating mechanism has been a significant trend over the past five to ten years. Unfortunately, newer licensing programs often involve negotiations with businesspeople who are fundamentally ignorant of patent law; discussions almost never involve the merits of the claim.

Mr. Rhoden agreed that the emerging patent thicket in the semiconductor industry creates significant negotiating problems in the industry, especially with firms that do not produce and sell semiconductors but assert infringement claims against industry participants.

Susan DeSanti from the FTC asked whether reforms in the patent procurement and litigation process could reduce the problem of patent thickets. Mr. Detkin replied that problems are resulting from the complexity of semiconductor technology and products, not from deficiencies at the PTO or overbroad applications of the doctrine of equivalents. Industry participants are resolving issues among producers through cross-licensing agreements; the real problem is hold-up, not thickets.

Mr. Telecky said that more patents have resulted from greater R&D expenditures at Texas Instruments; its disclosures correlate roughly with its R&D expenditures and have, for the

most part, remained steady over the past five years. The more significant change in the semiconductor industry has been the increasing number of filings from industry nonparticipants.

Mr. Poppen agreed with Mr. Detkin that the complexity of semiconductor technology was the most significant factor in the proliferation of patents in the industry. Though the PTO could improve aspects of the procurement process, the chief problem arises from the ability of nonparticipants to obtain injunctive relief. Mr. Barr said that patent thickets are a problem in the industry; the sheer quantity of patents makes it difficult to proceed with product introductions with any confidence that an infringement suit will not arise. Mr. Fox said that the patent system is far from perfect. Instead of rewarding true inventions, the patent system is routinely granting exclusive rights for marginal inventions. The real incentive for innovation arises from intense global competition, especially in high-technology markets. Ms. Mar-Spinola said that reform in the patent procurement process is both possible and desirable, especially with respect to issues like patent stalking. She added that the Federal Circuit needs to interpret patent law in the light of PTO regulations, and PTO regulations need to be reformed to reflect changes in patent law from the Federal Circuit. Mr. Telecky replied that "patent stalking" may reflect nothing more than a progressive realization by the inventor on more specific applications for its invention; PTO rules recognize the reality that the prosecution process may lead inventors to reconceptualize their inventions.

Susan DeSanti asked how antitrust law should assess patent pools, cross-licensing, and standard-setting. Mr. Fox said that patent owners were using the antitrust laws to prevent the public disclosure of licensing terms in the standard-setting context. According to Mr. Fox, the lack of transparency in licensing reduces the efficiency and effectiveness of patent pools and industry standards. Mr. Rhoden said that Advanced Memory International does not create patent pools when setting standards. In the standard-setting context, AMI requires patentholders to grant reasonable, nondiscriminatory licenses to inventions that may be incorporated into the standard. Mr. Barr said that patent pools and cross-licenses can reduce problems created by patent thickets and reduce royalty-stacking. He generally agreed that patentholders should disclose inventions when participating in the standard-setting process and should provide licenses on reasonable, nondiscriminatory terms. Reasonable and nondiscriminatory terms should, as a practical matter, reflect the extent to which multiple firms may have intellectual property rights incorporated into the standard. According to Mr. Barr, standard bodies may be a little too rigid in administering requirements of reasonable, nondiscriminatory terms (as well as enforcing disclosure requirements for patentholders).

Mr. Fox said that it may be difficult to determine in advance whether patents are "essential" (vs. "advantageous") in creating standards and package licenses for standards. Some firms may require more intellectual property than others when adopting the standard; requiring all firms to take the same package of rights (under a nondiscriminatory requirement) may be unduly rigid and inefficient. Mr. Barr and Mr. Fox both said that the enforcement agencies could clarify antitrust rules for the road in the standard-setting context, especially with respect to the permissibility of requiring transparency in licenses relating to standards. Mr. Rhoden said that the Antitrust Guidelines could be more specific about issues of price and royalties in licensing contexts.

Mr. Poppen said that the enforcement agencies should also continue to investigating bad-faith nondisclosures of relevant patents in the standard-setting context. Mr. Telecky disagreed, saying that the proliferation of standard-setting bodies in the computer industry, coupled with the size and diversity of intellectual portfolios, makes it very difficult for IP owners to ensure they are making sufficient or accurate disclosures to standards bodies on a continuing basis. The problem is exacerbated by the necessity of sending engineers to standard-setting bodies instead of attorneys; the cost of sending both would be immense. Even if the resources were available to provide completely accurate disclosures on a continuing basis, reasonable people would continue to disagree about patent scope, and whether individual patents are "essential," "necessary" or even "relevant" to specific standards. Firms may tend to err on the side of overdisclosure, resulting in excessive information for other participants to digest. Antitrust enforcement should acknowledge the complexity of the standard-setting process and the practical obstacles that firms confront in disclosing relevant patents.

Mr. Rhoden said that if firms subsequently discover they have patents relevant to the standard, they could waive their right to enforce it against participants in the standard-setting process. Lock-in, coupled with widespread adoption, gives patentholders the potential ability and incentive to engage in nondisclosure. Mr. Barr said that unenforceability may be too draconian; the proliferation of patents in the industry, coupled with uncertainty over scope, makes it difficult for firms to achieve complete accuracy when disclosing the range of patents that may affect a standard. Even if one limited the remedy to unenforceability with respect to the standard (allowing the owner to enforce against infringing uses outside the standard), the penalty may still be too draconian. Mr. Telecky said that if firms were forced to surrender their right to enforce their patents after failing to disclose them to standard-setting bodies, it is likely that a number of firms would choose not to participate. Mr. Rhoden responded that disclosure obligations may alienate some firms, but encourage more to participate in the standard-setting process.

Mr. Detkin said that the system is currently working. For the most part, firms will know whether they have patents that will affect standards. Losing the right to enforce some marginal patents that are undisclosed may be the cost of playing the standards game. Mr. Telecky agreed that no problems arise when the standard and the disclosure obligations are clear. But problems and uncertainty are likely to arise in many contexts. Mr. Detkin replied that limiting disclosure obligations to "essential" or "necessary" patents can eliminate much of the uncertainty.

Susan DeSanti then asked panelists to comment on the respective roles of competition and patents in promoting innovation in the semiconductor industry. Mr. Poppen said that competition is a more significant influence; firms attempt to become the low-cost providers of superior products. Micron would be unlikely to change its competitive behavior if patents were eliminated. Mr. Detkin said that fierce competition from a number of innovative firms -- large and small -- drives the semiconductor industry. Patents are, however, useful to prevent free-riding by firms that attempt to compete without incurring any of the costs of advancing progress in the industry. It is not difficult for manufacturers to copy semiconductors, especially in foreign markets. Mr. Fox agreed that patents are useful in preventing copying and free-riding. Patents can also provide decent returns on innovation, facilitate cross-licensing, and prevent other firms from obtaining exclusionary rights. Mr. Telecky said that it is important not to forget the

disclosure function of patents. Weaker patent protection would increase the use of trade secrets, which would reduce the pace of innovation in the marketplace. Mr. Rhoden said that competition drives innovation in the semiconductor industry; patents, according to Mr. Rhoden, have almost nothing to do with innovation in the industry. Mr. Detkin replied that the absence of protection would reduce the incentive to innovate. Mr. Barr said that the role of patents in promoting innovation may vary significantly across industries; in Cisco's markets, competition is the primary incentive to innovate. Ms. Mar-Spinola said that although patents can be useful, overzealous licensing may stifle innovation by reducing the incentive of firms to invest in different innovations. Licensing may therefore lead to greater homogeneity.

Mr. Telecky said that concerns about "thickets" are misguided. Firms resolve their differences through negotiation; patent owners do and should receive value for their inventions. The cost of asserting patents is a significant constraint on firms with weak or narrow patents. Reexaminations are another corrective mechanism that compensates for alleged problems in the patent procurement process. If firms believe that royalties are too expensive, they have the incentive to invest in their own noninfringing innovations. Professor Hall noted that 50% of reexaminations are commenced by owners of the patent.

Mr. Detkin said that the primary problem in the semiconductor industry is not invalid or unenforceable patents. Instead, it is the inevitable overlapping of intellectual property rights arising from the nature of semiconductor products and technology.

Ms. DeSanti thanked the panelists for their contributions and closed the session.

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