INNOVATION, ENTREPRENEURSHIP, AND THE INFORMATION AGE

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INTRODUCTION

It is a somewhat surreal experience to come back to Boulder as a government official. But in many important respects, I never really left. My perspectives on innovation, entrepreneurship, and the role of competition policy were shaped by my experiences and my work here. And they are among the important topics I am now focused on at the Department of Justice. So to bring my work in this area full circle, I will be talking about these topics today, discussing the role of entrepreneurship in our information age, how competition catalyzes entrepreneurship and innovation, and how antitrust law provides the foundation for competitive markets. Finally, I will touch on the institutional challenges that antitrust enforcers must confront in order to act effectively in dynamic markets.

I. ENTREPRENEURSHIP AND THE DYNAMICS OF THE INFORMATION AGE

For most of the 20th century, AT&T represented the telecommunications industry and the effort to regulate it was

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telecommunications policy. To that end, the company that Theodore Vail once championed as providing "one system, one policy, universal service" was indeed responsible for an explosion of telephone penetration, the employment of over a million Americans, and highly valuable basic research in its vaunted Bell Labs.[1] But that same company also suppressed innovation in the marketplace—thwarting the introduction of products that connected to its phone system, thumbing its nose at the development of the Internet, and taking its time in pursuing the development of mobile telephony.[2] It also operated as only a monopolist could, declining, for example, to purchase fiber optic technology from its inventor, Dow Corning, only doing so once competition (from upstarts MCI and Sprint) forced its hand.[3]

Promoting competition and entrepreneurship, as was eventually done in the telecommunications industry, is an essential component of innovation policy. In this respect, the United States enjoys an important advantage over other countries because, as *The Economist* put it, "entrepreneurialism is so deeply rooted in [our] history."[4] And indeed, the U.S. strength in entrepreneurship undoubtedly benefits from a willingness of entrepreneurs and businesses to take risks. This is part of what enables entrepreneurs to *try*, and then ultimately, to succeed.[5] In other countries, by contrast, the view of failure as a badge of infamy can undermine risk-taking behavior, discourage entrepreneurship, and eliminate a major source of innovation.

There are a number of critical factors, in addition to our entrepreneurial DNA, that explain and continue to fuel the U.S. entrepreneurial engine.[6] First, a strong domestic venture capital system provides the essential fuel for entrepreneurial startup activity, dramatically shaping our ability to drive innovation and economic growth. Second, the U.S. system of higher education is a crown jewel of our entrepreneurial engine; consider, for example, that half of the start-up firms in Silicon Valley reportedly are rooted in some fashion to Stanford University.[7] Third, the model of working for a single company

1. STEVE COLL, THE DEAL OF THE CENTURY: THE BREAKUP OF AT&T 8 (1986).

2. *Id.*

3. *See infra* note 42 and accompanying text.

4. Adrian Wooldridge, *Global Heroes: A Special Report on Entrepreneurship*, ECONOMIST, Mar. 14, 2009, at 6.

5. As Michael Porter put it: "Only in America can young people raise millions, lose it all, and return to start another company. . . . Our willingness to restructure, take our losses, and move on will allow the U.S. to weather the current crisis better than most countries." Michael E. Porter, *Why America Needs an Economic Strategy*, BUS. WK., Nov. 10, 2008, at 40.

6. For an extensive discussion of these factors, *see* EXECUTIVE OFFICE OF THE PRESIDENT, A STRATEGY FOR AMERICAN INNOVATION: DRIVING TOWARDS SUSTAINABLE GROWTH AND QUALITY JOBS (2009) [hereinafter Strategy for Innovation].

7. Wooldridge, *supra* note 4, at 7.

over the course of one's career—being an "IBM man," to take a 1960s example—is largely a relic of history. As *The Economist* recently put it, "[i]n the 1960s workers had had an average of four different employers by the time they reached 65. Today they have had eight by the time they are 30."[8] With that change, people are forced to take a more entrepreneurial attitude toward their own careers.

A final driver of entrepreneurship is our strength in three industries that are facilitating innovation at a greater pace than ever before: the computer, the mobile phone, and the Internet. Taken together, these technologies are—as Eric von Hippel put it—democratizing innovation.[9] After all, in today's world, a startup can easily gain computing power by contracting with Amazon (for access to its cloud computing capacity on a pay-as-you-go basis), develop an application that can immediately become a hit for the iPhone, or reach large audiences by establishing a respected blog (as Nate Silver has done at fivethirtyeight.com, using his statistics expertise to reimagine political polling).

The impact of entrepreneurship in the information age is being felt across the globe. Increasingly, entrepreneurs are finding business models that can deliver the information age to populations around the world. Consider, for example, how Iqbal Quadir, a Bangladeshi who emigrated to the U.S., developed a plan for using microfinance to enable women in villages to buy mobile phones and charge for access to them. Based on that plan, Bangladesh now has over 270,000 "phone ladies," who, using a specially designed mobile phone with long-lasting batteries, are selling minutes to local villagers. The venture now enjoys annual revenues in the neighborhood of $1 billion—all by tapping an entrepreneurial spirit and hunger for access to the information age.[10]

The dynamics of today's information age have pushed economists further away from the classic, static focus on prices—which remains an important part of economics, to be sure—to a greater appreciation for the impact of innovation. The godfather of this perspective, of course, is Joseph Schumpeter, who emphasized the opportunity for "gale[s] of creative destruction" to transform markets.[11] Stanford's Paul Romer offers a different metaphor to make the same point—"[e]conomic growth occurs whenever people take resources and rearrange them in ways that make them more valuable. . . . [It] springs from better recipes, not just more cooking."[12]

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8. *Id.* at 5.

9. ERIC VON HIPPEL, DEMOCRATIZING INNOVATION (2005).

10. Wooldridge, *supra* note 4, at 4.

11. JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY, 82 (1942).

12. Paul Romer, *Economic Growth*, *in* THE CONCISE ENCYCLOPEDIA OF ECONOMICS (David R. Henderson, ed. Liberty Fund 2008) (1993).

The international dynamics of entrepreneurship are spurring competition between countries—and cities—to welcome start-up businesses. In this respect, the Thomas Friedman suggestion of a "flat world" captures an important insight that was well qualified by Richard Florida, who remarked that "the world is spiky."[13] By that, Florida explained that "the tallest peaks [where innovation takes place]—the cities and regions that drive the world economy—are growing ever higher, while the valleys [which can be in the same countries as some of those peaks] mostly languish."[14] The World Bank, in an effort to spur (and judge) the effectiveness of countries' efforts to welcome entrepreneurial activity, began in 2003 to publish an annual report entitled *Doing Business*.[15] In that report, it measured how different countries handled business regulations, enforced property rights, and enjoyed access to credit. Moreover, it underscored the connection between economic prosperity and a welcoming attitude toward business. Consider, for example, the impact on entrepreneurship where governments can engage in hold-up—in effect, asking for a piece of a successful business without having to share in the risk on the front end. Such a practice, which takes place when there is a culture of corruption (as opposed to a commitment to the rule of law), is toxic to the entrepreneurial spirit. A milder, but still toxic pollutant, is the tendency of many countries' regulations to delay for months or years the ability of entrepreneurs to start new businesses.

As *The Economist* reported, this project of "naming and shaming" countries to improve their business climate has spurred more than 1,000 reforms and enabled countries to learn from and be inspired by the steps that others take.[16] And such reforms need not be limited to developing nations. On account of its commitment to entrepreneurship, Canada now enables individuals to start a business with just one procedure. Underscoring the importance of the dynamics spurred by the *Doing Business* report, Robert Litan, of the Kauffman Foundation, suggests that the World Bank "may have done more good by compiling *Doing Business* than by lending much of the money that it has."[17]

One fascinating dynamic in today's entrepreneurial economy is that the world is simultaneously more locally driven and more interlinked. It is more local because clusters of business start-up and expansion activity can create local symbiotic relationships that fuel further growth and

13. Richard Florida, *The World is Spiky*, ATLANTIC MONTHLY, Oct. 2005, at 48.

14. *Id.*

15. THE WORLD BANK GROUP, THE WORLD BANK, DOING BUSINESS (2010), http://www.doingbusiness.org (interactive online format).

16. Wooldridge, *supra* note 4, at 9.

17. *Id.*

innovation; it is more interlinked because ongoing technological development and races to innovate have created internationally interconnected networks for product development, production, and distribution. A key challenge, recognized and engaged by the Obama Administration's *Strategy for American Innovation*, is understanding how best to balance these local and global forces.[18] For countries, it creates an awkward dynamic insofar as modern economic forces are making both local geography and global connections more important. Thus, to be economically successful, countries must both support local economic clusters to spur entrepreneurship and innovation as well as participate and compete in global markets.[19] In short, any successful innovation policy in today's information age depends on clear and effective competition policy.

II. ANTITRUST LAW AND THE COMPETITIVE MODEL

Antitrust law, unlike classic command-and-control regulation, is the friend of entrepreneurs because it works in service of the free market (and not as a substitute for it).[20] Along these very lines, Justice Breyer once explained that:

> [A]ntitrust is not another form of regulation. Antitrust is an alternative to regulation and, where feasible, a better alternative. To be more specific, the classicist first looks to the marketplace to protect the consumer; he relies upon the antitrust laws to sustain market competition. He turns to regulation only where free markets policed by antitrust laws will not work—where he finds significant

18. Strategy for Innovation, s*upra* note 6, at 9 ("It is imperative to create a national environment ripe for entrepreneurship and risk taking that allows U.S. companies to be internationally competitive in a global exchange of ideas and innovation. Through competitive markets, innovations diffuse and scale appropriately across industries and globally."); *id.* at 17 (noting value of regional innovation clusters); *see also* ORG. FOR ECON. CO-OPERATION AND DEV., OECD INNOVATION STRATEGY (2010), http://www.oecd.org/innovation/strategy.

19. On the economic clusters point, Michael Porter reported that:

> [T]he task of forming economic policy and putting it into practice is highly decentralized across states and regions. There really is not a single U.S. economy, but a collection of specialized regional economies—think of the entertainment complex in Hollywood or life sciences in Boston. Each region has its own industry clusters, with specialized skills and assets. Each state and region takes responsibility for competitiveness and addresses its own problems rather than waiting for the central government. This decentralization is arguably America's greatest hidden competitive strength.

Porter, *supra* note 5.

20. *See* Town of Concord v. Boston Edison Co., 915 F.2d 17, 22 (1st Cir. 1990) ("Economic regulators seek to achieve [consumer welfare] directly by controlling prices through rules and regulations; antitrust seeks to achieve [this goal] indirectly by promoting and preserving a [competitive] process . . . ." (emphases omitted)).

> market 'defects' that antitrust laws cannot cure. Only then is it worth gearing up the cumbersome, highly imperfect bureaucratic apparatus of classical regulation. Regulation is viewed as a substitute for competition, to be used only as a weapon of last resort—as a heroic cure reserved for a serious disease.[21]

The impact of regulation can be more problematic than its "imperfect bureaucratic apparatus." In particular, regulated firms frequently develop a comfort level with their regulator, use government to raise barriers to entry, and, in some cases, remain protected from competition. Consider, for example, the old model of regulation for the airline industry. Under that model, Southwest Airlines was relegated to competing only in Texas, as the State of Texas authorized competition in the intrastate market while the Civil Aeronautics Board ("CAB") refused to allow Southwest to enter the interstate air transport market.[22] Similarly, AT&T took advantage of the FCC's willingness to bar entry, in one case famously restricting the use of a plastic, cup-like device that was used to provide greater levels of privacy protection when using a telephone. The D.C. Circuit's reversal of the FCC decision in that case—known as the "Hush-A-Phone" decision[23]—effectively set off the deregulatory process that culminated, through an antitrust consent decree, in the break-up of AT&T.

The flip side of the antitrust-regulation dynamic is that, for markets that are not natural monopolies, sound antitrust policy can guard against undue concentration, ensure the possibility of entry, and prevent incumbent firms from protecting their position through abusive practices. It is this dynamic, and the role of antitrust law in protecting entrepreneurship and disruptive entry, that I want to focus on today.[24] Before doing so, however, I must acknowledge a couple of intellectual debts.

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21. Stephen G. Breyer, *Antitrust, Deregulation, and the Newly Liberated Marketplace*, 75 CAL. L. REV. 1005, 1007 (1987) (emphasis omitted).

22. At least until Fred Kahn and others spearheaded a regulatory reform effort that deregulated the industry. *See* Philip J. Weiser, *Alfred Kahn as a Case Study of a Political Entrepreneur: An Essay in Honour of his 90th Birthday*, 7 REV. NETWORK ECON. 603, 605-09 (2008) (describing Kahn's spearheading of regulatory reform).

23. Hush-A-Phone Corp. v. United States, 238 F.2d 266 (D.C. Cir. 1956).

24. A STRATEGY FOR AMERICAN INNOVATION also makes this point:

> In many industries, small companies are critical innovators, bringing enormous benefits to consumers while putting competitive pressure on incumbent firms. The Obama Administration is committed to enforcing the antitrust laws to insure that innovative entrepreneurs are not excluded from the market by anti-competitive conduct. The Department of Justice actively investigates allegations of exclusionary conduct as part of its law enforcement mission to keep markets open and competitive.

Strategy for Innovation, *supra* note 6, at 17.

First, for all of us in the antitrust world, Michael Porter's work provides important inspiration and guidance. In particular, Porter's work underscores that nations with vibrant traditions of competition policy develop stronger companies prepared to compete in the world economy.[25] By contrast, Porter explains, protectionist policies—through regulation or otherwise—undermine the pressures for innovation that come from competition.[26] To that end, Porter explains in considerable part that America's economic engine rests on the fact that it has a steadfast "commitment to competition and free markets," driving a "remarkable level of restructuring, renewal, and productivity growth in the U.S."[27] Moreover, Porter explains, that strength requires active antitrust enforcement, including guarding against undue concentration that can allow single firms to dominate markets, thereby undermining competition and innovation.[28]

Second, on the point of connecting the importance of competition and innovation, my teacher, F.M. Scherer, both appreciated Schumpeter's focus on innovation and highlighted how he erred in evaluating what spurs innovation. In particular, Scherer's research led him to the conclusion that Schumpeter's suggestion that monopolies would innovate better than competitive markets was "more wrong than right," concluding that "giant monopolistic corporations were not uniquely efficacious engines of technological advance."[29] Indeed, as empirical analyses by Scherer and others have found, smaller firms tend to be more aggressive innovators,[30] even in cases where the large firms are the ones who sponsor the relevant basic research.[31] In short, as Scherer

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25. MICHAEL E. PORTER, COMPETITIVE ADVANTAGE: CREATING AND SUSTAINING SUPERIOR PERFORMANCE (1998).

26. MICHAEL E. PORTER, COMPETITIVE STRATEGY 29 (1980).

27. Porter, *supra* note 5.

28. Porter, *supra* note 25, at 206.

29. F.M. Scherer, *An Accidental Schumpeterian*, 40 AM. ECONOMIST 5, 13 (1996).

30. *See* Richard J. Gilbert, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate? in* INNOVATION POLICY AND THE ECONOMY 159-215 (Adam B. Jaffe et al. eds., 2006) (highlighting the spur to innovation from competitive market structures); F.M. SCHERER, INNOVATION AND GROWTH: SCHUMPETERIAN PERSPECTIVES 246–47 (1984) (concluding from empirical studies that entrenched monopolists tend to be averse to innovation for fear that new products will cannibalize revenues from their existing products); Wesley M. Cohen & Steven Klepper, *A Reprise of Size and R & D*, 106 ECON. J. 925, 925 (1996) (concluding that, in academic circles, an "enduring consensus emerged long ago that large firms have no advantages in R & D competition and may even suffer disadvantages"); *id.* at 929 ("[S]maller firms accounted for a disproportionately large number of patents and innovations relative to their size."); Douglas H. Ginsburg, *Antitrust, Uncertainty, and Technological Innovation*, 24 ANTITRUST BULL. 635, 649 (1979) ("Studies have indicated . . . that small firms are more efficient than larger ones in conducting research.").

31. Consider, for example, the case of Xerox, whose research laboratory—the Xerox Palo Alto Research Center (PARC)—developed numerous innovations, such as the graphical user interface and the mouse. Despite the excitement of the engineers who developed these

and Ross put it, "[t]echnological progress thrives best in an environment that nurtures a diversity of sizes and, perhaps, especially, that keeps barriers to entry by technologically innovative newcomers low."[32] This is, admittedly, a broad generalization and results vary from industry to industry, with some industries—like pharmaceuticals—plainly reliant on economies of scale to invest heavily in research and development efforts to produce new innovations.

With Porter and Scherer in mind, we can turn to the concept of "disruptive entry," which invokes Clayton Christensen's concept of disruptive technologies.[33] Such technologies, Christensen explains, rarely threaten legacy business models initially because they start out providing a lower quality version of an established product and serve a small, underserved segment.[34] Over time, however, the quality improvements in the product or service enable the firm deploying the disruptive technology to challenge the incumbent's product or service. That challenge is particularly difficult for the incumbent firm to weather because its willingness to adopt the technology and business model of the upstart would involve cannibalizing itself—that is, undercutting its own legacy model and eroding already profitable lines of business. Few firms are willing to take that step.

As one example of disruptive technology, consider some of the changes that the Internet has wrought. For years, established brokers charged relatively large amounts of money (say, $80-$100) for trades to buy or sell stocks. Today, the Internet provides a number of choices for low-cost brokerage services at about $10 per trade. To be sure, those trades do not come with the hand-holding that the brick-and-mortar firms offer, but most consumers elect the lower cost offering. For the classic, established brokers, the advent of Internet-backed brokerage firms, like Ameritrade and E-Trade, constituted a disruptive technology that left them with a terrible choice—meet the competition and cannibalize themselves by offering low-price trades online, or maintain their old business models and watch their market share erode.[35]

When confronted with disruptive entry, one tempting response for incumbents is to ask the regulator for protection. In the case of the

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inventions, Xerox failed to recognize their value, declined to commercialize them, and ultimately enabled the more entrepreneurial upstart, Apple Computer, to be the one to bring them to market. *See* MICHAEL A. HILTZIK, DEALERS OF LIGHTNING: XEROX PARC AND THE DAWN OF THE COMPUTER AGE (1999).

32. FREDERIC M. SCHERER & DAVID ROSS, INDUSTRIAL MARKET STRUCTURE AND ECONOMIC PERFORMANCE 660 (Houghton Mifflin Company 3d ed. 1990).

33. *See* CLAYTON M. CHRISTENSEN, THE INNOVATOR'S DILEMMA: WHEN NEW TECHNOLOGIES CAUSE GREAT FIRMS TO FAIL (1997).

34. *See id.* at 129.

35. Jerry Useem, *Internet Defense Strategy: Cannibalize Yourself*, Fortune, Sept. 6, 1999, at 121.

Internet-based trading, the established firms were indeed interested in convincing the SEC to block entry by Internet upstarts.[36] This dynamic makes it enormously important for regulators to adhere to competition policy principles and to resist the claims of incumbent industry players that they should be protected against entry.

To provide policymakers with the intellectual fortitude to resist such pressures, the Antitrust Division engages in competition policy advocacy that calls out protectionist efforts for what they are. Consider, for example, comments filed by the Division related to state certificate of need ("CON") programs in the health care field, which are often a precondition to opening a new facility. Because CON programs can restrict entry, they have the ability to impose costs through diminished competition that can outweigh any purported advantages. In Michigan, the Division filed comments with the State Senate on the proposed Certificate of Need standard for Proton Beam Therapy Services. As the Division letter stated:

> The standards [in the proposed legislation] have the potential to delay or exclude a competing and perhaps superior technology from entering the marketplace, and therefore may have substantial negative health consequences for cancer patients in Michigan. By requiring a majority of the nine largest radiation oncology providers to agree to collaborate before a certificate of need for a PBT unit will be issued, the proposed standards create a significant economic incentive for the current providers of radiation oncology services to protect their revenues by delaying or defeating entry of a competing product.[37]

Invoking this very analysis, Michigan Governor Granholm vetoed the legislation and made clear that a policy of open competition would best serve Michigan consumers.

Another set of responses by incumbent firms to the threat of disruptive entry is "self-help"—either individual or collective. By self-help, I mean any market practices designed to thwart the success of the entrant other than competing on the merits. To provide a few tastes of this dynamic, let me discuss a few notable examples of such conduct, and discuss the role for antitrust policy in this area.

In the Michigan CON case noted above, it was a set of incumbent providers who decided to cooperate in supporting a regulatory regime that would protect their market position and prevent a rival technology

36. *See, e.g.*, Diana B. Henriques, *Testing an Emerging Market; Can Wall St.'s Old Guards Cope With the New Trading?*, N.Y. TIMES, May 12, 1999, at C1.

37. Letter from Joseph Miller, Assistant Chief, Litigation I Section, Antitrust Division, United States Department of Justice, to Senator Michael D. Bishop, Michigan State Senate (Jun. 6, 2008), *available at* http://www.justice.gov/atr/public/comments/234407.pdf.

platform from entering the market. Incumbent firms need not seek legislation to accomplish this result, however. In the famous *Allied Tube* case, for example, a group of producers of metal conduit manipulated the vote of a standards body to ensure that a rival technology, i.e., one using plastic conduit, would be far less likely to be certified as safe and, more broadly, would be viewed as suspect.[38] Given that the judgments of the standards body were often incorporated into local construction codes, the vote of the body excluded the rival technology from the market. After it evaluated this course of conduct and the result, the Supreme Court recognized the competitive harm and consequences entailed by allowing a group of competitors to cooperate in spurring the standards body to act in the manner described above.[39]

In the area of single-firm conduct, the two leading cases in the last quarter of the 20th century—*U.S. v. AT&T*[40] and *U.S. v. Microsoft*[41]—both involved the efforts of an incumbent monopolist to thwart disruptive entry. In *U.S. v. AT&T*, the Justice Department's case focused on the efforts of AT&T to protect its legacy monopoly from would-be rivals in the equipment manufacturing and long distance markets. In the equipment market, AT&T used both its control over the interface to the telephone network and its monopsony power to forestall competition and the emergence of new technologies. Addressing AT&T's abuse of its monopoly power in both respects facilitated one of the century's most impressive innovations: the rise of the Internet. Notably, access to the telephone network through open interfaces was necessary for the development and deployment of modems, and the break-up of AT&T led to the upgrade in long-haul connections, principally through the deployment of fiber optic technology.

The impact of the AT&T case on the development of the disruptive entrant who developed fiber optic technology bears particular notice. Before the AT&T case was settled, AT&T took the position that it did not want to purchase the technology and, when it did, it would not do so from a disruptive entrant. As one account related:

> AT&T, which owned most of the telephone lines in America at the time [of the invention of fiber optic technology], said it would be 30 years before its telephone system would be ready for optical fiber. And when it was, AT&T planned to make its own fiber. . . . [After AT&T entered into a consent decree [with the federal government allowing competition in long distance], MCI took the risk [of

38. Allied Tube & Conduit Corp. v. Indian Head, Inc., 486 U.S. 492, 496-97 (1988).

39. *Id.* at 504.

40. 552 F. Supp. 131, 224 (D.D.C. 1982), *aff'd sub nom.*, Maryland v. United States, 460 U.S. 1001 (1983).

41. 253 F.3d 34, 55 (D.C. Cir. 2001) (en banc).

> ordering fiber optic technology] and placed a 100,000 kilometer order for a new generation of fiber.[42]

In this case, the effectiveness of the antitrust case enabled the disruptive entrant to prevail. In earlier eras, however, the incumbent firms were able to stall new entry and implement the very strategy AT&T envisioned for fiber optics: delaying the new technology and ultimately deploying it on its own, leaving the innovative entrant with nothing to show for its entry.

For an example of an entrant receiving insult on top of injury in return for its innovation, consider the case of Edwin Armstrong. Armstrong was a Columbia University Engineering Professor and the inventor of FM radio, who spent over twenty years seeking to convince the FCC to authorize the use of the technology. During that time, the established AM broadcasting incumbents (namely, NBC, CBS, and ABC) engaged in successful delaying tactics at the FCC and, conjoined with the delays caused by World War II, substantially limited the development of this technology until Armstrong's patents on the technology expired. Left broke and despondent, Armstrong committed suicide in 1954, bemoaning that "'by means of restrictive regulations and slippery measures, a superior scientific advancement could be overwhelmed by the shoddy and the expedient.'"[43]

More recently, *U.S. v. Microsoft* raised the core concern that a dominant firm used its monopoly power to squelch the threat posed by disruptive technologies. In that case, Netscape's browser product and Sun's Java technology—as the basis of a middleware platform—threatened to displace Microsoft's monopoly in the operating system market. Microsoft's response to this threat involved a series of acts designed to prevent this technology from taking off.[44] In *Microsoft*, the remedy provided access to open interfaces (in this case, application programming interfaces and communications protocols) as a means of ensuring that Microsoft could not use its control over them to prevent middleware rivals from emerging in the future.[45]

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42. Philip J. Weiser & Dale Hatfield, *Spectrum Policy Reform and the Next Frontier of Property Rights*, 15 GEO. MASON L. REV. 549, 605 n.276 (2008) (quoting *Telecommunications: The Role of the Department of Justice: Hearing Before the H. Comm. on the Judiciary*, 104th Cong. 125-26 (1995) (statement of Timothy J. Regan, Division Vice President and Director of Public Policy, Corning, Inc.)).

43. Thomas W. Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auction Faux Pas, and the Punchline to Ronald Coase's "Big Joke": An Essay on Airwave Allocation Policy*, 14 HARV. J.L. & TECH. 335, 412-13 (2001) (quoting LAWRENCE LESSING, MAN OF HIGH FIDELITY: EDWIN HOWARD ARMSTRONG 273 (1954)).

44. United States v. Microsoft Corp., 84 F. Supp. 2d 9 (D.D.C. 1999), *aff'd*, United States v. Microsoft Corp., 165 F.3d 952 (D.C. Cir. 1999).

45. United States v. Microsoft Corp., 231 F. Supp. 2d 144 (D.D.C. 2002).

III. INSTITUTIONAL CHALLENGES AND ANTITRUST REMEDIES

In reflecting on the challenges presented to antitrust law by the emergences of the new economy, Judge Richard Posner commented that antitrust law is "supple enough" to address dynamic and high technology issues.[46] "The real problem," Posner suggested, "lies on the institutional side: the enforcement agencies and the courts do not have adequate technical resources, and do not move fast enough, to cope effectively with a very complex business sector that changes very rapidly."[47] I am very sympathetic to Posner's perspective that antitrust institutions—as opposed to antitrust doctrine—deserve closer scrutiny. As such, I will close with a few reflections on this challenge in connection with the mission of antitrust law to support entrepreneurship by keeping markets open to the deployment of disruptive technologies.

The first institutional challenge is for antitrust agencies to develop sufficient market intelligence to know what emerging dynamics pose threats to established incumbents and may generate reactions of the types discussed above. This is no small challenge insofar as venture capitalists are not apt to invest in companies that need an antitrust strategy or, in the case of already funded companies, to implement an antitrust strategy in the face of predation that threatens the existence of the start-up firm. In this sense, Netscape was fortunate that Microsoft did not recognize the disruptive opportunities of the Internet until Netscape had already emerged.

To the extent that companies self-regulate and adopt pro-competitive responses to the threats of disruptive entry, that is a victory for the antitrust laws. Indeed, this type of response—which comes from public awareness of precedents like *U.S. v. Microsoft* and the effective counseling by numerous lawyers who advise their clients on what they can and cannot do—is the heart of the antitrust regime. Notably, possessing a monopoly does not raise an antitrust concern; after all, as Judge Learned Hand put it, "[t]he successful competitor, having been urged to compete, must not be turned upon when he wins."[48] Nonetheless, antitrust enforcers cannot take that compliance for granted and must evaluate the behavior of dominant firms to ensure that they don't abuse their monopoly power by excluding rivals from the marketplace.

The second formidable challenge for antitrust enforcement is to understand the dynamics of high technology industries so that antitrust enforcers can evaluate effectively the relevant competitive concern. As

46. Richard A. Posner, *Antitrust in the New Economy*, 68 Antitrust L.J. 925, 925 (2001).
47. *Id.*
48. United States v. Aluminum Co. of Am., 148 F.2d 416, 430 (2d Cir. 1945).

Judge Posner concluded and Assistant Attorney General Christine Varney has reiterated, the antitrust laws apply to technology industries, meaning that enforcers and courts must develop the analytical tools to sort "the wheat" (the practices of real concern) "from the chaff" (either fleeting or benign practices), especially in these rapidly evolving and complicated fields.[49] That does not mean that such issues are easy to understand. In my experience, however, relying on the dedication, intelligence, and care of the antitrust authorities is our best policy for addressing competition concerns. By contrast, the culture and sometimes protectionist traditions of regulatory agencies tend to promote stasis and be more susceptible to the pressures of the established firms.

The final institutional challenge, and perhaps the most daunting, is devising appropriate remedies. In my principal stab at this issue, I have suggested that one promising approach is for antitrust enforcers and courts to leverage, at least to some extent, the work of existing institutions, such as standard setting bodies, in responding to anticompetitive practices.[50] In the *Microsoft* consent decree, the oversight regime took a different approach, establishing a new institution, a technical committee, to monitor Microsoft's compliance with the decree. In the *Otter Tail* case, by contrast, the Supreme Court relied on an existing institution, the Federal Power Commission, to oversee the terms of a mandated commitment to provide wholesale wheeling services.[51] Whether courts identify existing institutions capable of aiding a remedial strategy or seek to develop new ones, it is clear that more thought and care must be devoted to this important area.

CONCLUSION

The role of innovation is critical to our nation's economy and the antitrust laws are premised on the importance of promoting innovation through the competitive process. In the case of competition between established firms, antitrust law is able to function reasonably well insofar as the relevant issues are very likely to be raised by the parties themselves and the enforcers will be well positioned to make a decision. The harder challenges for antitrust enforcers are to address and remedy efforts to squelch the development of more nascent disruptive entrants. To address such cases, antitrust enforcers must work hard to identify the relevant areas of competitive concern, evaluate whether or not the antitrust laws

49. *See* Christine A. Varney, Assistant Att'y Gen., Vigorous Antitrust Enforcement in this Challenging Era, Remarks as Prepared Before the Center for American Progress 6-7 (May 11, 2009),.

50. *See* Philip J. Weiser, *Regulating Interoperability: Lessons from AT&T, Microsoft, and Beyond*, 76 ANTITRUST L.J. 271 (2009).

51. Otter Tail Power Co. v. United States, 410 U.S. 366, 375-77 (1973).

were violated, and devise appropriate remedies where a violation is found. This work is every bit as challenging as it is important.