

Microsoft and Standard Oil: radical lessons for antitrust reform

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Ignorance and uncertain inference are the norm in antitrust.

Frank H. Easterbrook¹

I. Introduction

Central to the current antitrust case against Microsoft is the Department of Justice's allegation that Bill Gates's firm possesses monopoly power. But how can we tell if the DOJ's allegation is correct? Microsoft currently enjoys a large share of the market for personal-computer operating-system software, and software mar-

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¹ Frank H. Easterbrook, *Ignorance and Antitrust*, in ANTITRUST, INNOVATION, AND COMPETITIVENESS 127 (Thomas M. Jorde & David J. Teece, eds., 1992).

kets arguably are "network" goods. But while these facts plausibly are evidence of monopoly power enjoyed by Microsoft, they are not necessarily so.

We argue here that because history teaches that markets are astonishingly robust at protecting consumers from dominant firms—even dominant firms that serve network markets—Microsoft's currently large market share is not sufficient evidence of monopoly power. Nor is it true that this large market share is self-perpetuating. In particular, we build upon straightforward economic principles to argue that the best evidence of whether or not Microsoft possesses monopoly power is Microsoft's own behavior. Because, in our view, Microsoft behaves as though it faces competition, we conclude that it *does* face competition.

History is important to our analysis, for it provides the best evidence of the market's ability (or inability) to protect consumers from a dominant firm's monopolistic misbehavior. The next section examines the history of J. D. Rockefeller's Standard Oil Company. Reviewing the history of Standard Oil is appropriate because Microsoft is frequently compared to Standard Oil prior to its forced break-up in 1911.² Bill Gates in the late 20th century, like Rockefeller in the late 19th century, is the foremost entrepreneur in a relatively new, dynamic, profitable, and highly visible industry. Also like Rockefeller, Gates is accused of using unfair, ruthless, and illegal means of competition to achieve the very large market that his firm enjoys. But contrary to popular myth, Standard Oil did not win its large market share by engaging in practices that harmed consumers. Instead, the large market share that Standard Oil attained at the end of the 19th century resulted from its success at achieving efficiencies that none of its rivals could match at the time.

Nor was Rockefeller, even at his peak, immune to competition. In section III, we conclude from this history of Standard Oil that large market share is not synonymous with monopoly power. Microsoft, like Standard Oil, arguably achieved and maintains its

² See, e.g., Alan Murray, *Reading Rockefeller and Busting Up Trusts*, WALL ST. J., May 18, 1998, at A1.

large market share by serving consumers well. And in a market economy built upon the division of both labor and knowledge, no firm serves consumers well by following a simple and general recipe. Rather, a market economy requires deep specialization and doing things in ways that nonspecialists cannot fully understand or grasp. Indeed, even specialists can never fully understand the larger, market-wide consequences of their actions.³ It follows that the best available evidence of whether or not a firm enjoys monopoly power is the firm's own record at satisfying consumer demands: Do real prices in markets in which the firm offers products fall? Does output in these markets expand? Are innovations in these markets regular? If so, the firm is likely not a monopolist. Like Standard Oil, Microsoft does not behave as though it possesses monopoly power. Therefore, we argue that it, in fact, does not possess monopoly power.

In section IV we take our argument one step further. We argue that in addition to specialization, another critical feature of the modern market economy—entrepreneurial creativity—provides further reason to limit the ability of administrators and courts to interfere on antitrust grounds. Not only is antitrust not required to keep markets performing well (as experience with both Standard Oil and Microsoft shows), but antitrust inevitably hurts consumers by hamstringing the competitive process.

II. Standard Oil: success through competitiveness

The discovery of crude oil, and of methods of refining it into kerosene, sharply improved the lives of most Americans. Not only was kerosene cheaper than whale oil; it also did not smoke or gum. Before 1865, when Rockefeller went into the oil business,

³ See LEONARD E. READ, I, PENCIL (Foundation for Economic Education, 1958; reprinted 1998) (explaining that no single person knows, or can possibly know, all that must be known to produce even something as ordinary as the familiar pencil; instead, pencils are the result of market coordination of the actions of literally millions of people—each with a different stock of knowledge—into a social process that produces pencils).

kerosene prices fluctuated wildly. In 1870, the year he reorganized his company as Standard Oil, kerosene sold for 26 cents a gallon and Rockefeller had a 4% market share.⁴

During the 1870s, Rockefeller surged to the top of the oil-refining business. By 1880, Standard's market share was 80%–85%.⁵ Standard extracted more kerosene per barrel of crude than did any of its competitors. Not satisfied with this greater production efficiency, Rockefeller searched for new uses for the by-products. He used the gasoline for fuel, some of the tars for paving, and shipped the naphtha to gas plants. He pioneered in selling lubricating oil, petroleum jelly, and paraffin for candles.⁶

Rockefeller constantly searched for—and found—ways to save. For example, he built his refineries well and bought no insurance. He also employed his own plumbers and almost halved the cost of labor, pipes, and plumbing materials. Coopers charged \$2.50 per barrel; Rockefeller cut this cost to 96 cents when he bought his own tracts of white oak timber, his own kilns to dry the wood, and his own wagons and horses to haul it to Cleveland. There, with machines, he made the barrels, hooped them, glued them, and painted them blue.⁷

Under Rockefeller, Standard Oil plowed its profits into bigger and better equipment; and, as volume increased, he hired chemists and developed 300 by-products from each barrel of oil. They ranged from paint and varnish to dozens of lubricating oils to anesthetics. As for the main product, kerosene, Rockefeller made it so cheaply that whale oil, coal oil, and, for a while, electricity

⁴ DOMINICK T. ARMENTANO, *ANTITRUST AND MONOPOLY* 58 (1982).

⁵ *Id.*

⁶ Much of the description of Rockefeller and Standard Oil is taken from BURTON W. FOLSOM, JR., *THE MYTH OF THE ROBBER BARONS* 82–100 (1996).

⁷ 1 ALLAN NEVINS, *STUDY IN POWER: JOHN D. ROCKEFELLER* 183–86, 268–70, 289 (1953); HAROLD F. WILLIAMSON & ARNOLD R. DAUM, *THE AMERICAN PETROLEUM INDUSTRY: THE AGE OF ILLUMINATION* 342–68 (1959); and JOHN D. ROCKEFELLER, *RANDOM REMINISCENCES OF MEN AND EVENTS* 88 (1933).

lost out in the race to light American homes, factories, and streets. “We had vision,” Rockefeller later said. “We saw the vast possibilities of the oil industry, stood at the center of it, and brought our knowledge and imagination and business experience to bear in a dozen, in twenty, in thirty directions.”⁸

Rockefeller's boast is supported by the evidence. Between 1870 and 1885, the price of refined kerosene dropped from 26 cents per gallon to 8 cents. By 1890, this price fell further to 7³/₈ cents. In 1897, this price dropped to 5.91 cents. Standard's costs fell even more dramatically: Standard's average cost of refining a gallon of kerosene in 1870 was 3 cents. By 1885, this cost was down to 0.452 cents.⁹ Petroleum output during these years went from 840 million gallons in 1880 to 1.9 billion gallons in 1890 to 2.6 billion gallons in 1897.¹⁰ These pro-consumer changes occurred even though Standard's market share during the 1880s and much of the 1890s was close to 90%.

Did Rockefeller, once he had his large market share, engage in predatory price-cutting? Absolutely not, says John McGee, who is an authority on this issue. According to McGee, Rockefeller avoided predatory strategies because these would have been costly and ineffective. The reasons for this conclusion are today well-known and need not be reviewed here.¹¹

Most significantly for our purposes, Standard's immense market share was not self-perpetuating. The problem is that in a market economy—with dozens of profit-hungry and able competitors rushing to do business in a large industry like oil—few businesses are immune to competitive forces. In the early 1900s, Standard

⁸ NEVINS, *supra* note 7, at 666.

⁹ ARMENTANO, *supra* note 4, at 60.

¹⁰ *Id.* at 66. See also RALPH & MURIEL HIDY, *PIONEERING IN BIG BUSINESS* 130–54 (1955); ARMENTANO, *supra* note 4, at 67.

¹¹ John S. McGee, *Predatory Price Cutting: The Standard Oil (N. J.) Case*, 1 J. L. ECON. 137 (1958). See also Frank H. Easterbrook, *Predatory Strategies and Counterstrategies*, 48 U. CHI. L. REV. 263 (1981), for a thorough review of the myriad reasons why below-cost pricing is an extremely unlikely means of achieving monopoly power.

refused to invest in the oil boom in Texas; after that error, Standard Oil delayed in switching from kerosene to gasoline. Gulf Oil, for example, was a leading innovator in providing corner gasoline stations to serve the new wave of cars on the road. Despite Standard's continual expansion of output, its market share began a steep descent in the late 1890s. By 1907 this share was down to 68%. And by 1911, the year the Supreme Court handed down its famous decision breaking up Rockefeller's company, Standard's market share had fallen further to 64%.¹² As Ralph and Muriel Hidy wrote, "even before the breakup of the combination, the process of whittling Standard Oil down to reasonable size within the industry was already far advanced."¹³ The more-recent assessment of economist Dominick Armentano supports this conclusion: "Standard was a large, competitive firm in an open, competitive market."¹⁴

III. Specialization and the informational value of Microsoft's behavior

Conventional wisdom is mistaken about Rockefeller, Standard Oil, and antitrust's role in keeping the oil industry competitive. Unfortunately, this mistaken conventional wisdom distorts not only our historical understanding, but also our current beliefs of the need for antitrust intervention. In particular, the Standard Oil experience shows four facts that counsel caution not only against using antitrust to stymie Microsoft but, indeed, against using antitrust at all.

First, Standard Oil's large market share resulted from Rockefeller's obsession with increasing its operating and distribution efficiencies—efficiencies that permitted Standard continually to

¹² FOLSOM, *supra* note 6, at 83–105. See also CRAIG THOMPSON, *SINCE SPINDLETOP: A HUMAN STORY OF GULF'S FIRST HALF-CENTURY* (1951); and Thomas J. DiLorenzo, *The Ghost of John D. Rockefeller*, 48 *THE FREEMAN* 334, 335 (1998).

¹³ RALPH & MURIEL HIDY, *supra* note 10, at 477.

¹⁴ ARMENTANO, *supra* note 4, at 66.

lower the prices it charged consumers. Standard's pricing and operating practices helped consumers.

Second, despite attaining a large market share, despite any "first-mover" advantages that it might have enjoyed over up-start rivals, and despite its proven record of creative innovation, Standard was never immune to competitive forces. Eventually, Standard's missteps allowed rivals to cut into its market share. To credit the 1911 *Standard Oil* decision with finally diminishing Standard's market dominance credits government intervention for, at best, ratifying a *fait accompli*. Competitive rivalry in the market had by 1911 undone any claim that Standard might have had to being an indomitable industry force. There is simply no basis for arguing, as *Wall Street Journal* writer Alan Murray does, that "[o]nly after the government busted the Standard Oil trust did anything like free-market competition return" to the oil industry.¹⁵

Third, Standard's loss of market share was unexceptional. Other corporate behemoths of a century ago faced the same problem of having their market share whittled down by smaller, more entrepreneurial competitors. U.S. Steel, for example, was formed in 1901 by a merger of many of the largest and most successful firms in the American steel industry. But the 61% market share that U.S. Steel enjoyed in 1901 shrank to 39% within two decades because it relied too heavily on making rails. Bethlehem Steel innovated in structural steel and steadily nibbled away at U.S. Steel's dominance. Similarly, American Sugar Refining watched its market share shrink from almost 98% in 1893 to 25% in 1927. Bigness could not prevent rivals from making better products and selling them at lower prices.

Fourth—and most important for our thesis—even when Standard enjoyed its largest market share, it never acted like a monopolist. It always behaved as though it faced stiff competition. In our view, the firm's own observed behavior is the best evidence of whether or not the firm enjoys monopoly power.

¹⁵ Murray, *supra* note 2.

As the history of Standard Oil reveals, large market share, by itself, is neither evidence of monopoly power nor an assurance of continued market domination. Something more than large market share must be shown to prove that Microsoft has monopoly power. The most potent and sure source of monopoly power is government protection from competition—a privilege that Microsoft doesn't enjoy.¹⁶ While we sympathize with those who argue that government protection is the only lasting source of monopoly power,¹⁷ we need not here deny that some source of monopoly power exists other than government-granted privilege. But those who accuse Microsoft of having monopoly power must identify something other than Microsoft's large market share as the source of this power—for, again, a large market share might well result from Microsoft's unusual ability at satisfying consumer demands.

The DOJ and many commentators point to the network features of operating-system software as a likely source of

¹⁶ We ignore here the possibility that copyright protection granted by government to Microsoft is inappropriate. First, we know of no evidence that intellectual-property statutes have been consistently twisted to favor Microsoft. Second, if Microsoft's current market position is due to an intentional or a mistaken misapplication of intellectual-property protection, the solution is not to be found in antitrust regulation. The appropriate solution would be to correct the misapplication of intellectual-property law that unnecessarily protects Microsoft from competition.

¹⁷ See, e.g., YALE BROZEN, *IS GOVERNMENT THE SOURCE OF MONOPOLY?* (1980); MURRAY N. ROTHBARD, *MAN, ECONOMY, & STATE* 591 (1963) ("[M]onopoly is a grant of special privilege by the State, reserving a certain area of production to one particular individual or group. Entry into the field is prohibited to others and this prohibition is enforced by the gendarmes of the State."). Rothbard traces his definition of monopoly back to Lord Coke. Joseph Schumpeter also came close to defining monopoly in this way. See JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* 99 (1942) ("[P]ure cases of long-run monopoly must be of the rarest occurrence and . . . even tolerable approximations to the requirements of the concept [of monopoly] must be still rarer than are cases of perfect competition. The power to exploit at pleasure a given pattern of demand . . . can under the conditions of intact capitalism hardly persist for a period long enough to matter for the analysis of total output, unless buttressed by public authority.").

Microsoft's alleged monopoly power.¹⁸ They argue that, because applications software (such as word-processing programs) must be consistent with a computer's operating-system software, any dominant operating-system software has an advantage—unrelated to merit—over rival operating-systems software because of the great costs and coordination effort it would require for all computer users, hardware manufacturers, and applications-software producers to switch from Windows to a superior operating-system software.

A great deal of research casts severe doubts on this explanation. Economists Stan Liebowitz and Stephen Margolis have debunked numerous allegations of allegedly superior products being kept from the market by network effects.¹⁹ They also document several instances of inferior network goods actually being displaced by newer and better network goods. For example, Sony's Beta-format video recorders were on the market 2 years before the better VHS-format technology was introduced. VHS, of course, quickly displaced Beta.²⁰ Other examples include the replacement of vinyl LPs by compact disks; the replacement of VHS camcorders by 8 mm camcorders; the replacement of 5 1/4-inch floppy-disk drives by 3 1/2-inch floppy-disk drives. Indeed, Windows itself replaced DOS (which itself replaced CP/M). There is, quite simply, scant evidence that network externalities (or "path dependence") are a source of monopoly power in real-world markets. Stated differently, the evidence shows that consumers are

¹⁸ See, e.g., Thomas G. Donlan, *Network Power*, BARRON'S, Feb. 2, 1998, at 62.

¹⁹ See S. J. Liebowitz & Stephen E. Margolis, *Path Dependence, Lock-in, and History*, 11 J. L. ECON. & ORG. 205, 224 (1995) ("To date, convincing documentation of cases in which market activity sustains remediable error remains absent.").

²⁰ S. J. Liebowitz & Stephen E. Margolis, *Policy and Path Dependence: From QWERTY to Windows 95*, 18 REGULATION 33, 37 (1995). These researchers show that, contrary to popular belief, the VHS format is superior to the Beta format in that VHS permits longer recording time. The increasing popularity of DVDs means that this newer technology might ultimately displace VHS.

not long locked into products that are less efficient than rival products. If a firm achieves and maintains large market share without the protection of government privilege, the reason is likely to be that the firm—even one that sells a network product—offers to consumers deals that are more attractive than anyone else currently offers.

Of course, the DOJ can contend that evidence from the past, and from other industries, on the ability of markets to overcome network externalities is not relevant to today's computer-software industry. We would dispute this contention. But even if this evidence from other industries doesn't apply to the software industry, we nevertheless have other powerful evidence that Microsoft is not protected from competition—namely, Microsoft itself behaves as though it is not protected from competition. In our view, this evidence is compelling.

If Microsoft's large market share is rooted in an unfair or inefficient monopoly advantage, or if this large market share itself is a source of monopoly power, then Microsoft would behave like a monopolist. It would restrict output and raise prices. Properly done, industry studies would reveal a slowdown in innovation, a hike in prices (or a softening of a secular downward trend in prices), and a restriction in output. Moreover, such studies would show that the market valuation of computer-industry firms whose products are complementary to Microsoft's (e.g., hardware producers) rose whenever antitrust actions against Microsoft were announced, and fell when such actions were curtailed.²¹

But little such evidence exists. In fact, the evidence suggests quite strongly that Microsoft acts like a firm beset with potential rivals. It is as if Bill Gates and his lieutenants each read Schumpeter's classic work on capitalist competition and took to heart his warning that "the position of a single seller can in general be con-

²¹ This claim assumes (heroically, in our view) that antitrust actions yield the desired outcome—namely, reducing the defendant's monopoly power. If this assumption does not generally describe reality, then even if Microsoft is a sinister monopolist, the case for antitrust actions leveled against it is weak.

quered—and retained for decades—only on the condition that he not behave like a monopolist."²²

Stan Liebowitz, reporting on research he conducted with Stephen Margolis, argues that "Microsoft achieved its success by making better products."²³ According to these researchers, for example, the competition of Microsoft's Excel spreadsheet software has dropped spreadsheet prices by about 80% between 1986 and 1996. Similarly with word-processing software: Microsoft's aggressive improvements and marketing of its Word program have pushed prices of word-processing software down to about a quarter of what these were in 1986.

Liebowitz and Margolis find also that, from the late 1980s through the mid-1990s, "in the five software categories where Microsoft did not have a product, prices fell by an average of about 15%. But in the 10 categories where Microsoft does compete, either with a separate product or with a component of the operating system, prices fell by approximately 65%."²⁴

²² SCHUMPETER, *supra* note 17, at 99.

²³ Stan Liebowitz, *Bill Gates's Secret? Build Better Products*, WALL ST. J., Oct. 20, 1998, at A22. A recent, jointly released study by the Consumer Federation of America, the Media Access Project, and the U.S. Public Interest Group argues that Microsoft's prices have risen in real terms during the 1990s. Liebowitz, however, shows this study to be fundamentally flawed. See Liebowitz, *A Defective Product: Consumer Groups' Study of Microsoft in Need of Recall, CEI On Point*, 9 Feb. 1999 (available at <www.cei.org/onpoint/0299-sl.html>). Two other excellent studies of Microsoft are worth noting: Robert A. Levy, *Microsoft and the Browser Wars: Fit To Be Tied*, CATO POLICY ANALYSIS, Feb. 19, 1998 (Washington, DC), and Richard B. McKenzie & William F. Shughart II, *Is Microsoft a Monopolist?*, 3 INDEPEN. REV. 165 (1998). Along with Liebowitz & Margolis, Levy, and McKenzie & Shughart, conclude that Microsoft has consistently behaved competitively rather than monopolistically.

²⁴ Liebowitz, *Bill Gates's Secret?*, *supra* note 23, at A22. Also, it is important to appreciate the benefits brought to consumers by Microsoft's openness to hardware vendors. While Apple and IBM (with OS/2), Digital Equipment, and Atari refused to sell their operating systems separate from their hardware, Microsoft stuck to software and encouraged thou-

Compelling evidence against the proposition that Microsoft acts monopolistically gets even stronger. George Bittlingmayer and Thomas Hazlett have discovered that the market valuation of computer-software firms complementary to Microsoft (excluding Microsoft) *fall* when antitrust actions are announced against Microsoft and rise when these actions are curtailed.²⁵ And, finally, Franklin Fisher (the government's chief economic expert in the Microsoft trial) admitted at trial that Microsoft's alleged anticompetitive behavior has not yet harmed consumers.²⁶

What, then, explains Microsoft's behavior? We can think of only two possible explanations. First, Microsoft's aggressive actions are predatory, aimed at augmenting its monopoly power in the future. This is the explanation offered by the government.²⁷ The alternative explanation posits that Microsoft genuinely believes itself not to possess real monopoly power. We find this second explanation more plausible than the first. And if this second explanation *is* correct, it speaks volumes about the dangers of antitrust regulation. Before turning to this second explanation, though, we first dispose of the explanation alleging predation.

sands of hardware suppliers to provide the computers, monitors, and printers. The Windows operating system provided, first and foremost, the necessary drivers that allowed Windows-compatible programs made by any software producer to work with personal computers, printers, and monitors made by any hardware producer.

The downside of Microsoft's openness has been some complexity and hardware conflicts between products sold by the huge number of vendors whose products work with those of Microsoft. This complexity is what Macintosh users see as the alleged inferiority of the "Wintel" platform. Mac users benefit from a tighter integration of hardware and software because they are provided by a single firm.

²⁵ George Bittlingmayer & Thomas W. Hazlett, *DOS Kapital: Has Antitrust Action Against Microsoft Created Value in the Computer Industry?* J. FIN. ECON. (forthcoming 2000).

²⁶ *Government Wraps Up Microsoft Case*, L.A. TIMES, Jan. 13, 1999, at 3.

²⁷ See, e.g., John R. Wilke & Keith Perine, *Testimony Against Microsoft Draws to a Close*, WALL ST. J., Jan. 13, 1999, at A4 (reporting government's allegation of predation).

Charges of predation should be approached warily. It is as easy as it is tempting for firms to accuse their rivals of predation. And the more competitive the industry, the easier and more tempting it is to issue such accusations. Predation is so readily alleged because it is virtually indistinguishable from vigorous competition. Predators—that is, firms who rid themselves of tomorrow's rivals by today offering consumers such good deals that no rival can survive—look just like especially talented, determined, or energetic competitors.

Consider, for example, Franklin Fisher's trial testimony that "Microsoft is not maximizing its profits in the price it sets for Windows"; instead, it "takes some profit . . . in a form of protection of its monopoly."²⁸ In light of the history of Standard Oil, isn't Fisher's a convoluted way of interpreting Microsoft's behavior? A more straightforward and, we believe, accurate description of Microsoft's behavior is that it keeps its price low because it fears competition.²⁹ Admitting that a firm keeps its price low to protect "its monopoly" is really a tacit admission that the firm has no monopoly. Microsoft surely does keep its price low to protect its market share, but again, large market share and monopoly are not at all identical. Only someone who refuses to distinguish monopoly from large market share interprets Microsoft's low prices as necessarily aimed at protecting monopoly power.

Moreover, it is well to remember that while the number of predation claims is significant,³⁰ the number of bona fide instances of predation is sparse. As William Baumol recently wrote, there is

²⁸ *Id.*

²⁹ Note that much of the competition confronting Microsoft's current output (such as Windows 98) comes from past generations of Microsoft output (such as Windows 95). We thank Bob Levy for this insight.

³⁰ In a review of private lawsuits filed by competitors of defendants and clearly alleging antitrust violations, Edward Snyder and Thomas Kauper found that 20% of such suits involved allegations of predatory pricing. And nearly 75% of these suits involved allegations of anticompetitive exclusion more generally. See Edward A. Snyder & Thomas E. Kauper, *Misuses of the Antitrust Laws: The Competitor Plaintiff*, 90 MICH. L. REV. 551, 556–58 (1991).

"general consensus among informed observers that genuine cases of predation are very rare birds."³¹

We see nothing about Microsoft's actions suggesting them to be an exception to the rule that accusations of predation are typically mistaken. As is true for firms in other industries, Microsoft would profit from predation only if it expects to hold on to future monopoly power for a time sufficiently long to recoup its predatory losses.³² But given that the single most vital input in Microsoft's industry is ingenuity in writing computer code, no monopoly in this industry is likely to last very long. Only if market dominance itself protects incumbents against new upstarts will this threat of new entry be unlikely to undermine Microsoft's ability to recoup its predation losses. But again, as Liebowitz and Margolis have shown, even network effects do not protect incumbents against more-efficient rivals. As such, predation is no more likely to be a sensible business strategy for Microsoft than it is for firms in other industries.

The Bittlingmayer-Hazlett empirical findings provide additional reason to be skeptical of claims that Microsoft is a predator. If Microsoft's contracting, distribution, and pricing practices promise to create for Microsoft monopoly power (or to increase whatever monopoly power it currently possesses), this fact should be reflected in lower share prices of other computer hardware and software firms. After all, firms whose products are complementary

³¹ William J. Baumol, *Predation and the Logic of the Average Variable Cost Test*, 39 J. L. ECON. 49, 51 (1996). In one of the few documented examples of predatory price cutting, the predator ended up as the prey. In 1904, the Dow Chemical Company was threatened with and received predatory cuts in bromine from the Bromkonvention, a German cartel that dominated the world production of bromine. Herbert Dow's response was instructive: he bought up much of the Bromkonvention's low-cost bromine, repackaged it, and resold it profitably all around the world—including Germany. Dow's response to the Germans shows an inherent problem in all predatory price cutting, which is why it is so rarely attempted. See BURTON W. FOLSOM, JR., *EMPIRE BUILDERS* 94–99 (1998).

³² Kenneth G. Elzinga & David E. Mills, *Testing for Predation: Is Recoupment Feasible?*, 34 ANTITRUST BULL. 869 (1989).

to those of Microsoft will suffer if Microsoft gains a monopoly. Hence, if Microsoft were a predator, announcements of antitrust actions against it would raise the share prices of these firms. But as reported above, announcements of antitrust actions against Microsoft *reduce* the share prices of other computer-industry firms, while any news of easing by the antitrust authorities in their investigation of Microsoft *raises* the market value of computer firms. These findings are inconsistent with the allegations that Microsoft is a predator.

If Microsoft's continuing competitive vigor isn't predatory, this firm must genuinely believe that it confronts competitors (either actual or potential). No one is better placed than Microsoft itself to assess the threat posed by potential competition. Therefore, the fact that Microsoft acts as though it faces competitive rivalry is the best evidence that Microsoft in fact *does* face competitive rivalry. Again, it is as though Gates and Co. took to heart Schumpeter's warning that "a monopoly position is in general no cushion to sleep on. As it can be gained, so it can be retained only by alertness and energy."³³ No one can seriously question Microsoft's "alertness and energy" in responding to industry trends. Its "alertness and energy" demonstrates that it fears that its rivals might eventually catch up.

The informational value of Microsoft's own continuing competitive vigor cannot be overestimated. A team of the world's finest and most public-spirited economists, administrators, lawyers, and judges cannot hope to know as much about the software industry as does Microsoft. This fact has nothing to do with the intelligence or diligence of Microsoft employees relative to that of outside analysts. Rather, this fact rests solidly on a key feature of a market economy—namely, the division of labor and the corresponding division of knowledge.³⁴

³³ SCHUMPETER, *supra* note 17, at 102.

³⁴ According to F. A. Hayek, "Through [the price system] not only a division of labor but also a co-ordinated utilization of resources based on an equally divided knowledge has become possible." F. A. HAYEK, *INDIVIDUALISM AND ECONOMIC ORDER* 88 (1948).

Our economy is so productive precisely because labor today is so finely specialized. Each producer possesses deep knowledge of a relatively narrow range of productive activities. It is this deep knowledge that makes specialists so productive. The deeper the knowledge, the more productive the specialist. But achieving this deep knowledge requires that each specialist know less and less—indeed, that he know nothing in most cases—about other productive activities or industries.

Regardless of the intellectual firepower and dedication to the commonweal that might characterize Attorney General Janet Reno, antitrust chief Joel Klein and his aides, the state attorneys general, and Judge Thomas Penfield Jackson, not one of them specializes in the computer-software field. The very fact that these people rose to such heights in the legal profession implies that they dedicated their time to learning law and legal procedure; they had no time to learn the deep details of the software industry. No matter how much access they now have to advanced economic theory and sophisticated econometric analyses, they simply do not possess the unique knowledge of, and experience with, the countless details that must be mastered to compete successfully in the software industry.

Therefore, the single best source of information we can have on whether or not Microsoft enjoys monopoly power is Microsoft's own behavior. If Microsoft acts as though it faces competition, then the best we can do is to assume that in fact it *does* face competition. Only if Microsoft acts like a monopolist—that is, only if Microsoft raises the real prices it charges for its products and restricts output—can we reasonably infer that Microsoft enjoys monopoly power. Because the evidence strongly suggests that Microsoft acts as though it confronts competitors, we conclude that Microsoft does not enjoy monopoly power. Government lawyers and economists—and even Judge Jackson—might sincerely believe that Microsoft enjoys monopoly power, but such beliefs are necessarily those of people who have neither the knowledge nor the personal incentives to assess as accurately as does Microsoft the market situation.

IV. The importance of entrepreneurial creativity

It's not only a modern economy's utter dependence upon the division of labor and knowledge that counsels caution when interfering with market outcomes. Another relevant feature counseling caution is capitalism's dependence upon entrepreneurial creativity. This creativity, by its nature, is both unpredictable and far more likely to emerge from people who have some experience with the industry in question. But also—creativity being what it is—it will never be the result of a consensus of the experts. And it certainly will disprove any predictions made by anyone who insists that his models give him an accurate and detailed picture of the future. D. McCloskey is surely correct to insist that “the model of the future is no substitute for the entrepreneur's god-possessed hunch.”³⁵ Such hunches are an indispensable fuel of competitive markets.

When a nonspecialist—and, indeed, when even a typical specialist—looks at a market currently “dominated” by a single firm, the natural reaction is to assume that this dominance will perpetuate itself. The reason this is a natural tendency is that envisioning a successful challenge to that dominance requires entrepreneurial foresight and imagination; it requires thinking of the market in fundamentally different ways—ways that *no one* has so far thought of. For any particular industry, only a tiny fraction of the population has sufficient knowledge, insight, and vision to see how successful challenges might be launched.

The history of the market economy, however, is nothing if not a history of continual, entrepreneur-driven changes in products and production processes. Some changes are singularly momentous—for example, Henry Ford's use of the assembly line—but most changes, standing alone, are relatively small. The consequence, however, is a constant, immense improvement in product offerings and in production and distribution processes.³⁶ The

³⁵ D. N. McCLOSKEY, *IF YOU'RE SO RICH* 133 (1990).

³⁶ “The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process Capitalism, then, is by

record of entrepreneurs continually revolutionizing markets is so deep that to ignore this record or to assume that it doesn't apply to the computer-software industry would be foolish. It would be an inexcusable and unscientific rejection of the message told by more than 200 years of experience with capitalist economies.

Even if the world's finest economists and lawyers cannot envision just how Microsoft's currently high market share in operating-systems software might be undone by entrepreneurial challenges, this fact hardly means that we should therefore assume that entrepreneurial challenges will not undo Microsoft's dominance if Microsoft begins to harm consumers. There simply is no reason to suppose that such people possess any particular savvy or creativity regarding the software industry. (Indeed, because these people have chosen to specialize in another industry, there is ample reason for *rejecting* their opinions about the difficulty of successful competitive challenges to Microsoft's current market position.) Any survey of the history of market capitalism reveals that a successful entrepreneurial challenge will indeed one day be launched against Microsoft. This challenge might bankrupt Microsoft, or it might merely bite a large chunk out of Microsoft's market share. But it *will* happen, just as it happened to Standard Oil, U.S. Steel, American Tobacco, and to any number of seemingly impregnable industrial giants of the past.³⁷ We mustn't let our own individual inability to envision just how this challenge might succeed blind us to the fact that it will indeed succeed. Again, the nature of entrepreneurial creativity is that

nature a form or method of economic change and not only never is but never can be stationary The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates." SCHUMPETER, *supra* note 17, at 82–83. See also W. MICHAEL COX & RICHARD ALM, MYTHS OF RICH & POOR (1999), for Schumpeterian-style evidence on the continuing improvements in living standards generated by capitalism.

³⁷ Note, for example, that almost half of the firms that in 1980 made the Fortune 500 list were off that list by 1990. See THOMAS SOWELL, THE VISION OF THE ANOINTED 66 (1995).

only a tiny handful of people can imagine how to challenge today's "dominant" firms.

Active antitrust regulation distorts or douses this entrepreneurial creativity in at least three ways. First and most obviously, if government stands ready to interfere with a successful firm's pricing, producing, distributing, and contracting practices, challengers are more likely to compete with the firm for the favor of administrators, judges, or juries rather than for the favor of consumers. Entrepreneurial creativity gets channeled out of markets and into administrative and adjudicative arenas.³⁸ And again, these are arenas manned by people with no particular expertise (or personal incentive) to govern the market in ways that generate long-run benefits for consumers.

Second, as markets grow more complex—as the division of labor and knowledge deepen and tasks become more specialized—administrators, judges, and jurors can understand fewer and fewer of the nuances and reasons underlying certain business practices. Entrepreneurs whose creative means of serving the market involve unfamiliar practices run a large risk of having these means second-guessed by antitrust authorities.³⁹ The risk of such second-guessing is a tax; the greater this risk, the higher this tax. And raising this tax means reducing the number of creative market responses to current "dominant" firms.

³⁸ See, e.g., William F. Shughart II & Robert A. Levy, *Antitrust*, in CATO HANDBOOK FOR CONGRESS 399, 405 (1999) (arguing that modern scholarship has shown antitrust to be "a playground for special pleaders" and that "[a]s long as government has the power to help or hurt various interests by regulating merger activity and other business practices, the groups that have a stake in the law enforcement outcomes will rationally strive to shape those outcomes in their own favor").

³⁹ Regrettably, economists cannot be counted upon to restrain administrators and judges, for Ronald Coase's lament in 1972 remains true nearly 30 years later: "[I]f an economist finds something—a business practice of one sort or another—that he does not understand, he looks for a monopoly explanation." Coase, *Industrial Organization: A Proposal for Research*, in POLICY ISSUES AND RESEARCH OPPORTUNITIES IN INDUSTRIAL ORGANIZATION 67 (V. R. Fuchs, ed., 1972).

Third, no one can know a priori—or independent of the market process itself—just what are the best ways of challenging a currently “dominant” firm. Indeed, independent of an actual rivalrous struggle among alternative ways of challenging a firm’s dominance, there *is no* best way. The details of the competitive struggle itself—the particular, unique, creative innovations that entrepreneurs devise to compete for profits—themselves help to *define* what turns out to be the best way of challenging a dominant firm. As James Buchanan points out, the order of the market is “defined in the process of its emergence.”⁴⁰ The particulars of this order are not preordained; nor can they be successfully planned or even foreseen in advance.

But active antitrust policing implies that government either imposes a certain “solution” to the current market dominance of a firm (e.g., declaring the source code for Windows to be public property), or at least that government short-circuits a set of market-based means of challenging this dominance. For example, it might be that because of the benefits consumers gain from network effects, the best competitive struggle takes place among alternative suppliers of types of operating systems, with only a single type at any time winning the lion’s share of the market. Today Windows. Tomorrow Linux. A decade from now an operating system not yet invented.

But any antitrust remedy that forces the supplier of today’s dominant operating system to share its source code with other suppliers who can then mimic that operating system short-circuits competition among different *types* of operating systems. Antitrust reduces the payoff to such successful innovations. The result is a dampening of the incentive to develop a wholly new, different, and better kind of operating system (or distribution method, or

whatever else might succeed in displacing a dominant operating-system supplier).

V. Conclusion

The implication of our straightforward point is indeed radical. The specialization and entrepreneurial creativity lying at the heart of a market economy are fundamentally at odds with antitrust oversight by administrators, judges, and jurors who necessarily have no specialized knowledge nor experience of the kinds that are necessary for success in the industries in question. To have nonspecialists sit in judgment of the business decisions of specialists—and, moreover, specialists with experience and with their own wealth at stake—promises far more consumer harm than benefit.⁴¹ It is best to strip administrators and courts of such power. At the very least, this conclusion seems valid for all antitrust oversight apart from policing against overt collusion.⁴²

⁴¹ The importance not only of specialization, but of the experience that comes only with long and intimate practice, is explained nicely by economic historian David Landes. According to Landes, “Even in later ages of scientific diffusion and transparency, even with sample products and equipment, even with blueprints and explicit instructions, some know-how can be learned only by experience.” DAVID LANDES, *THE WEALTH AND POVERTY OF NATIONS* 278 (1998). Landes tells of how the French, having lost manufacturing capacity during World War I, sent to the United States explicit blueprints and instructions on how to manufacture French 75-mm field guns. The Americans couldn’t do it. Not until some French manufacturers with experience in manufacturing these guns actually went to America to show how it is done were American factories able to produce these guns. *Id.* See also MICHAEL POLANYI, *PERSONAL KNOWLEDGE* 52 (1962) (giving a real-world example of how “indefinable knowledge is still a part of technology”). Policy makers should pay more heed to such local, specific, and tacit knowledge. See VIRGINIA POSTREL, *THE FUTURE AND ITS ENEMIES* 92 (1998) (“Working without details, let alone intimate knowledge, [governments] pass laws that force us to explain the unexplainable, to give ‘good reasons’ for choices we can barely articulate to ourselves.”).

⁴² But even antitrust prohibition of overt collusion might be unjustified. See, e.g., Donald Dewey, *Information, Entry, and Welfare: The Case for Collusion*, 69 AM. ECON. REV. 587 (1979); Donald Dewey,

⁴⁰ James M. Buchanan, *Order Defined in the Process of Its Emergence*, in *LIBERTY, MARKET AND STATE* 73–74 (J. M. Buchanan, ed., 1985) (“[T]here is no means by which even the most omniscient designer could duplicate the results of voluntary interchange. The potential participants *do not know until they enter the process* what their own choices will be. From this it follows that it is *logically impossible* for an omniscient designer to know.”).

It is important not to commit what science writer Matt Ridley calls "the reverse naturalistic fallacy"—inferring an *is* from an *ought*.⁴³ In an ideal world, perhaps it's true that selfless, neutral government officials would have sufficient knowledge to stand guard over the economy and strike down any deviation from ideal competition. Because we know that markets typically fall short of textbook perfection, the temptation is to insist that such oversight *ought* to be possible. But if it *is* possible depends on whether or not those administrators charged with antitrust oversight can acquire the requisite knowledge to use antitrust in socially beneficial ways.

We argue above that the very source of a modern market economy's immense productivity—deep specialization of tasks and of knowledge, along with entrepreneurial creativity—itself prevents administrators from gaining access to enough information and insight to permit them to intervene productively into industries. No amount of wishing that this problem didn't exist will make it less real. It is not true that administrators can gain sufficient knowledge to use antitrust regulatory powers productively; the fact that it *ought* to be true does not make it so. Thus the danger: when administrators (even those supernatural ones who escape political influence) intervene in markets they substitute their own uninspired ignorance for the knowledge of experienced specialists and for the ingenuity of creative entrepreneurs.

Welfare and Collusion: Reply, 72 AM. ECON. REV. 276 (1982); George Bittlingmayer, *Decreasing Average Cost and Competition: A New Look at the Addyston Pipe Case*, 25 J. L. ECON. 201 (1982); and John E. Lopatka, *The Case for Legal Enforcement of Price Fixing Agreements*, 38 EMORY L. REV. 1 (1989).

⁴³ MATT RIDLEY, *THE ORIGINS OF VIRTUE* 257–58 (1997).