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Is Microsoft a Monopolist?

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AND

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The Microsoft monopoly is self-evident, if the Justice Department's lawyers are to be believed. In the complaint filed against Microsoft in the U.S. District Court of the District of Columbia on May 18, 1998, the Justice Department declares unequivocally that "Microsoft possesses (and for several years has possessed) monopoly power in the market for personal computer operating systems."¹

The Justice Department's lawsuit merely reaffirms the position U.S. Attorney General Janet Reno had previously staked out: "Microsoft is unlawfully taking advantage of its Windows monopoly to protect and extend that monopoly." Hence, it seems beyond dispute that the Justice Department's antitrust assault on Microsoft will, if successful, produce benefits for the American public. "We took action today [in the courts]," Reno announced earlier this year, "to ensure that consumers will have the ability to choose among competing software products" (*PC Magazine* 1997).² Assistant Attorney General Joel Klein echoes Reno's claims. In a statement accompanying his department's antitrust complaint, he charges that "in essence, what Microsoft has been doing, through a wide variety of illegal business practices, is leveraging its Windows operating system monopoly to force its other software products on consumers" (Klein 1998b, 1).

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Both Klein's and Reno's allegations appear to reflect a widespread public sentiment. Indeed, it has become common for reporters, columnists, scholars, and computer industry analysts to use terms such as "monopoly" or "near monopoly" to describe Microsoft, as if the firm's monopoly status were an established fact, not one open to debate. *Wall Street Journal* reporter Alan Murray (1998) declares flatly on the front page of his paper, "Microsoft *is* a monopoly" (emphasis in original). It is such, Murray tells us, because Bill Gates has managed to win near-total control of the most valuable real estate in business today: "His Windows operating system has become almost the sole entry point to cyberspace."³ Michael Miller, editor in chief of *PC Magazine*, has seconded Murray's conclusion, asserting that "Microsoft has an effective monopoly on PC operating systems. He [Jim Barksdale, head of Netscape] knows it, Bill [Gates] knows it, and all the senators [who questioned Gates at a Senate hearing in early 1998] know it. So do all of us who buy PCs" (Miller 1998). Miller's only remaining concern is whether antitrust or regulatory action would be good for the computer industry.

Given the assumption that Microsoft has monopolized the market for computer operating systems, the critics have felt comfortable applying their rhetorical skills to condemn Microsoft's founder and CEO Bill Gates, who is viewed with animosity as a real-life counterpart of Gordon Gekko, the unsavory character in the 1980s movie *Wall Street*. Gekko is renowned for having proclaimed, in a fit of self-congratulation, the moral goodness of unchecked greed.

Indeed, the rampant criticism of Microsoft's purportedly unfettered market power has given rise to increasingly shrill attacks. A *Los Angeles Times* editorial chided Microsoft for having "macro-gall" when it sought to defuse the threat of an adverse court decision by offering computer manufacturers two versions of Windows 95: an older version without Internet Explorer and a newer version with Internet Explorer included (*Los Angeles Times* 1997). Even former Republican presidential candidate Bob Dole, who once defended Microsoft against Justice Department action but who now lobbies for competing computer software companies, accepts antitrust intervention as necessary because "Microsoft's goal appears to be to extend the monopoly it has enjoyed in the PC operating system marketplace to the Internet as a whole and to control the direction of innovation" (Dole 1997).

New York Times columnist Maureen Dowd (1998) has minced few words in her denunciation of Gates as a "rich spoiled brat" who has not yet realized the "grim truth": "People hate Microsoft even more than they hate the Government." Gary

1. *U.S. v. Microsoft Corp.*, May 18, 1998, 1. Hereinafter cited as "Complaint."

2. These remarks were made by Attorney General Janet Reno at a press conference held to explain her request that a federal judge impose a fine of \$1 million a day on Microsoft for as long as Microsoft requires computer manufacturers to bundle Internet Explorer with Windows 95.

3. Murray (1998) adds, "The most important question being debated in Washington now isn't whether Microsoft is a monopoly, or even whether it stifles some competition. It is whether the government can do anything about it without causing more harm than good."

Reback, a Silicon Valley antitrust lawyer, mused to the *New Yorker*, “The only thing the robber barons did that Bill Gates hasn’t done is use dynamite against their competitors.”⁴ In his article on Microsoft for the electronic magazine *Slate*, Jacob Weisberg observed, “A few months ago, everyone I met seemed to think that working for Microsoft was a pretty cool thing to do. Now, strangers treat us like we work for Philip Morris” (Dowd 1998).

Because of Microsoft’s dominance in the market for computer operating systems and hence its presumed monopoly status, a growing collection of state attorneys general (twenty at the time the Justice Department filed its suit) began to coordinate with federal trustbusters their investigations of Microsoft’s past practice of incorporating its own services and programs within Windows without also giving other vendors the same right. Apparently, the attorneys general were especially worried that the forthcoming version of Windows, Windows 98, would seamlessly integrate Microsoft’s Web browser, Internet Explorer, thus precluding, in their collective view, the installation of competing browsers. New York Attorney General Dennis Vacco summed up his colleagues’ conclusion that Microsoft’s product development strategies are evidence of monopoly power by saying, “It would be unfortunate if one company were allowed to control access to the Internet in violation of the antitrust laws, restricting consumer choice and stifling competition before it has a chance to develop” (Bank 1998).

Firms in the computer industry want to go even further to rein in what they believe is Microsoft’s undue market power. They have begun a drive to have the U.S. Justice Department force Microsoft to be more open in allowing programmers outside of Microsoft to have access to the code that Microsoft’s programmers have. They also want Microsoft to be prohibited from integrating into Windows new products that compete directly with non-Microsoft programs and to have Microsoft divest itself of its software compatibility laboratories, which offer a Windows-approved logo to outside vendors (Markoff 1998).

As the deadline for filing its antitrust suit neared, the Justice Department began to insist in its negotiations that Microsoft must also include a copy of rival Netscape’s Web browser with each copy of Windows sold, if Microsoft’s own Internet browser, Internet Explorer, was integrated into Windows 98 (Brinkley 1998). Indeed, in its antitrust suit, the Justice Department seeks such a remedy, mentioning Netscape (and only Netscape) by name. Specifically, the Justice Department asks the courts to prevent Microsoft from including its browser software in Windows unless “Microsoft also includes with such operating system the most current version of the Netscape Internet browser.” Moreover, if the Justice Department gets its way, Microsoft would be forced

4. As quoted in Dowd 1998. Early in this century, the American Banana Company complained that its leading rival, United Fruit, had undertaken a variety of anticompetitive acts, including blowing up some of American Banana’s Central American facilities, in order to preserve its domination of the banana export business. See *American Banana Co. v. United Fruit Co.*, 213 U.S. 347 (1909).

to allow computer manufacturers to delete Internet Explorer and to alter in other ways the sequence of screens computer users see as Windows boots up.⁵

The complaint filed by the Justice Department on May 18 levels three specific charges of unlawful behavior against Microsoft. The list of alleged antitrust violations includes “agreements tying other Microsoft software products to Microsoft’s Windows operating system; exclusionary agreements precluding companies from distributing, promoting, buying, or using products of Microsoft’s software competitors or potential competitors; and exclusionary agreements restricting the right of companies to provide services or resources to Microsoft’s software competitors or potential competitors.”⁶

We do not wish to join the chorus of criticism of a major American firm and its leadership now under way in the courts and the press. On the contrary, our purpose is to ask for a pause in the debate in order to consider the easily skirted issue of whether as a general matter firms with large market shares—not just Microsoft—can legitimately be classified as “monopolists” and, if so, whether they *should* be subjected to the antitrust sanctions now at issue in what is likely to be a protracted court battle. We also ask whether Microsoft’s business practices are necessarily those of a monopolist; and more specifically, whether the types of tying and exclusionary agreements Microsoft has been accused of employing represent the unfair methods of competition they have been purported to be.

Even if a firm can, in some sense, be found guilty of violating the antitrust laws (because such laws make tying arrangements and exclusionary contracts illegal), it does not necessarily follow that Microsoft’s actions have been those of a classic monopolist (even when the industry is beset with “network effects,” which the Justice Department’s lawyers believe to be endemic to the computer software business). Many market behaviors that might be construed as violations of the antitrust laws might also be interpreted as the behaviors expected of highly competitive firms. Even if a firm can be classified as having, in some sense, “monopoly power,” one must also be concerned with whether or not antitrust action can be taken in a timely manner, before market forces are likely to correct any extant abuse of market power; and whether antitrust action, if taken, can generate the heralded consumer benefits to an extent that more than compensates for the legal expenditures and for the costs resulting from the disruption of markets while the suit winds its way through the courts. This issue is hardly a minor one: recall that the Justice Department wasted substantial legal resources in its infamous thirteen-year prosecution of IBM, and note that if the Justice Department and state attorneys general prevail, future product developments in high-technology industries may be tightly constrained.⁷ That upshot could mean that competition would be thwarted, not promoted. Indeed, the threat of antitrust penalties in cases pursued

5. Complaint, 52.

6. Complaint, 2.

because of a firm's dominance in its industry can have the perverse effect of forcing the firm to act not as a competitor but as a monopolist, thereby harming consumers.

Two Distinct Issues

At the outset, two issues in the public debate over Microsoft's supposed monopoly status must be distinguished. First is the technical legal issue of whether Microsoft violated its 1995 consent agreement with the Justice Department, along with the more general question of whether it has violated the antitrust laws. In the 1995 agreement, Microsoft consented not to require computer manufacturers who install Microsoft's Windows operating system to also install "separate" products.⁸ At the same time, the 1995 agreement allowed Microsoft to continue to sell Windows with "integrated" components. For example, Windows Explorer, which allows computer users to organize files with relative ease, is presumably viewed by both Microsoft and the Justice Department as an integrated component of Windows.

Now, Microsoft has been accused of unfairly demanding that computer manufacturers also install Internet Explorer, a Web browser, as a condition of installing its Windows operating system. That requirement may or may not be a violation of the 1995 agreement or the antitrust laws, mainly because Internet Explorer may or may not be viewed by the courts as an "integrated" component of Windows, as defined by that agreement. The decision depends on how the language of the 1995 agreement is interpreted. Therefore, the resolution of the issue hinges on the precise meaning of "integrated," that is, on how much mutual interdependence must exist before Windows and Internet Explorer are deemed to be "integrated."⁹ To what extent does Internet Explorer rely on the code built into Windows, and vice versa? Can Internet Explorer be "uninstalled" without compromising the operation of Windows?

We have no way of knowing how the courts will rule on such semantic issues, but our basic concern is conceptual, not semantic. However the case against Microsoft ultimately turns out, the definition of "integrated," as well as the extent to which the laws prohibiting tying contracts and exclusionary agreements are judged applicable,

7. The Justice Department filed its antitrust case against IBM in 1969. In 1982 the Justice Department terminated the case after an internal review concluded that "the case was without merit and should be dismissed." By 1977, IBM had been forced to produce 61 million pages of documents, whereupon the Justice Department subpoenaed 5 billion more pages, which, according to one estimate, would have taken sixty-one thousand man-years and \$1 billion to organize (DeLong 1998).

8. The relevant paragraph in the consent decree reads as follows: "Microsoft shall not enter into any license agreement in which the terms of that agreement are expressly or impliedly conditioned upon: (1) the licensing of any other covered product, operating-system software product or other product (provided, however, that this provision in and of itself shall not be construed to prohibit Microsoft from developing integrated products); (2) the O.E.M. [original equipment manufacturer] not licensing, purchasing, using, or distributing any non-Microsoft product" (Manes 1998).

9. Lawrence Lessig, the Harvard professor specializing in technology law appointed as an advisor (or "Special Master") to the court handling the case, agreed in a letter to the court that Windows 95 and Internet Explorer are an "integrated" product (Bank and Wilke 1998).

cannot help but be influenced by how the courts expect Microsoft's behavior to change in response to the accepted meanings of these terms. Hence, the issue of whether Microsoft *is* viewed, or *should be* viewed, as a monopolist (in the economic as well as the legal sense) will necessarily play a key role in determining the court's findings. Therefore, the question expressed in our title—Is Microsoft a monopolist?—is of more than academic interest. Its answer cannot be presumed without rigging the debate over what the judge should do.

The Justice Department has argued that Microsoft has given away its Web browser for years as a distinct, stand-alone product. That determination, supported by Microsoft's own promotional materials that treat Windows and Internet Explorer as separate products, has prompted the Justice Department to conclude that it is unlawful for Microsoft to require computer manufacturers to install Internet Explorer when the manufacturers also install Windows. Hence, the Justice Department has argued that Microsoft should be fined \$1 million a day if it has not complied with the 1995 agreement, as the Justice Department interprets that agreement (Gruley and Wilke 1998). The Justice Department's lawyers do not seem concerned that having a browser fully integrated into the Windows operating system makes sense and provides consumers with benefits, as recognized by technology journalists.¹⁰ To its critics, the key assumption is that Microsoft *has* a monopoly in the market for operating systems and that the firm is trying to use its monopoly position to "extend its operating system monopoly into other software markets," most notably the browser market, and in that way to preclude Netscape from developing an alternative operating system (using the Java language).¹¹ The Justice Department's position notwithstanding, we should keep in mind that combining the operating system and browser into one "integrated" system could make considerable sense if consumers want to minimize the time and trouble of moving from the look and feel of one program (the operating system) to that of another (the browser) and if a personal computer in the near future must be able to operate as fluidly within the World Wide Web as it does presently within the confines of the computer box.

Microsoft, on the other hand, has argued that its Web browser is indeed "integrated," meaning that Internet Explorer uses some of the code in Windows and itself contains code needed by Windows in order for Windows to operate properly. Take out Internet Explorer from the latest version of Windows 95, Microsoft contends, and the operation of Windows is necessarily impaired. Moreover, Microsoft has stressed that the *integration* of Internet Explorer is really a gradual *process* that has been under way for years, with full integration expected with the release of Windows 98, which Microsoft

10. Wildstrom (1998) and Howard (1998) have discussed the benefits of integrating Internet Explorer with Windows.

11. Complaint, 1.

began shipping to computer manufacturers the same day the Justice Department filed its lawsuit (Gates 1997, 1998).

Again, the issue of whether Microsoft violated its 1995 agreement could be settled only in the courts, as it ultimately was in January 1998. Microsoft effectively yielded to the Justice Department's demands by agreeing to offer two versions of Windows 95, one with an Internet Explorer icon available on the "desktop" (the screen that appears when Windows is initially loaded) and another version with the icon absent (but with a link to Internet Explorer through a menu of other Windows subprograms).

Prior settlements and any future settlement of the current antitrust suit, however, have no bearing on the central concern of this article. To reiterate, our purpose here is to consider the separate, more fundamental issue of whether Microsoft is a monopolist by asking whether Microsoft's market actions fit the expected behavior of a monopolist. Granted, Microsoft is actually being accused of violating the nation's antitrust laws, mainly the provisions of the Clayton Act that make it illegal, "where the effect . . . may be to substantially lessen competition or tend to create a monopoly,"¹² for a firm to "tie" the sale of one separate product (which Internet Explorer might legally be judged to be) to the sale of another (Windows 95). Behind the prohibition of tie-in sales lies the presumption that a firm with monopoly power may be able to use product-bundling strategies to protect and extend its monopoly, with consequent injury to consumers' welfare.

Even though Microsoft gave in to the Justice Department's demands that two versions of Windows be offered—one with and one without Internet Explorer (Wilke 1998)—it is still not necessarily the case that Microsoft is a monopolist. All the Justice Department has done is to get another court-enforceable agreement from Microsoft, which is a substantially different matter from proving that Microsoft is a monopolist, the standard definition of which is a firm that seeks to enrich itself by restricting output in order to raise its prices and profits at consumers' expense.

Many legal and economic scholars have concluded that the antitrust laws have been used more frequently to thwart competition than to restrain monopoly. That outcome has been associated especially with antitrust violations involving tie-in sales, which presumably is the specific offense for which Microsoft would be sanctioned. Rather than a symptom of the exercise of monopoly power, tie-in sales in general—and Microsoft's product development strategy in particular—can be construed as an understandable competitive response on the part of a company that seeks to maximize consumer gains while it attempts to expand its sales and profits. From the perspective of the pertinent economic literature, a Justice Department victory can be interpreted as partial validation of Microsoft's claim that it has been acting competitively. To appreciate that point, we need first to reflect on exactly what a monopoly is.

12. Clayton Act sec. 3, 38 Stat. 730 (1914), as amended, 15 U.S.C.A. secs. 12–27 (1980).

The Meaning of Monopoly

The Justice Department's charge that Microsoft is a monopolist rests mainly on the fact that some version of the Windows operating system is currently used on some 80 percent of all personal computers in the world and that Microsoft has required computer manufacturers to install Internet Explorer if they also install Windows on the systems they ship (Gruley and Wilke 1998).¹³ Neither the 80 percent market share nor the required installation of Internet Explorer, however, necessarily makes Microsoft a monopoly worthy of antitrust remedies.

To be sure, commonly accepted definitions of monopoly might suggest that Microsoft is a monopoly by virtue of its dominant market share. The tenth edition of the *Merriam-Webster Collegiate Dictionary* defines monopoly in three ways: (1) "exclusive ownership through legal privilege, command of supply, or concerted action"; (2) "exclusive possession or control"; and (3) "a commodity controlled by one party."

Moreover, elementary college-level textbooks in economics start their discussions of monopoly, as does Paul Samuelson, by talking in terms of the "extreme case" of monopoly, called "pure monopoly," in which a given industry has a "single seller" and "there is no industry producing a close substitute for his [the monopolist's] good" (Samuelson 1980, 462).

A less precise definition of monopoly (something less than a *pure* monopoly) might warrant calling Microsoft a monopolist, given the company's apparent industry dominance and the use of the term *dominance* in loose definitions of monopoly.¹⁴ However, critical even to the most rudimentary definition of monopoly is the concept of the *market* in which Microsoft is presumed to operate. Even if the "market" is restricted to firms selling computer operating systems, Microsoft is clearly not the only seller, but it surely is a dominant one, given its 80 percent (or greater) share of sales. However, if the relevant market is defined more broadly, Microsoft's dominance is not nearly so great.¹⁵ The company's sales represent only 5 percent of total dollar sales in

13. In the media, Microsoft has been variously described as controlling over 80 percent or even 90 percent of the computer operating system market. The Justice Department's lawyers probably had the extent of Microsoft's dominance right when they wrote in their complaint, "Microsoft's 'Windows' operating systems are used on over 80 percent of Intel-based PCs, the dominant type of PC in the United States. More than 90 percent of new Intel-based PCs are shipped with a version of Windows preinstalled" (Complaint, 1).

14. For a summary of the ways in which "monopoly" has been defined historically by the courts, see Shughart 1997, 236–44. Evolving attempts to measure market power empirically are discussed in Shughart 1997, 145–55.

15. According to the Justice Department's most recent merger guidelines, a relevant antitrust market is defined by identifying "a product or group of products and a geographic area" such that a hypothetical monopolist selling in that market could increase its price by a "small but significant and nontransitory" amount. As a practical matter, the antitrust authorities have used a 5 (sometimes 10) percent price increase that persists for two years without attracting substantial new entry into the market so defined as a benchmark for drawing the boundaries of markets that are relevant for antitrust analysis. For a discussion of the pitfalls in defining relevant antitrust markets, see Shughart 1997, 244–57.

the software market and, of course, a much smaller percentage of total dollar sales in the computer market as a whole (DeLong 1998).

If the relevant market is the *browser market*, as measured in dollar sales, then Microsoft has a zero percent share, for the simple reason that it has given Internet Explorer away. Admittedly, in this case assessing market dominance on the basis of sales can be misleading,¹⁶ but that point is precisely what needs to be kept in mind: a firm may have a dominant market share, even be the sole seller, of a product not because it has acted monopolistically—meaning that it has garnered monopoly profits by restricting sales and raising price—but because it has done just the opposite, namely lowered its price in order to expand its customer base to encompass a large fraction of all buyers.

A firm that exercises its monopoly power could actually have a smaller market share measured in unit sales, dollar sales, or both, than a firm that acts competitively. Measured in dollars, a seller's market share depends critically on the response of sales to a change in price—in economists' jargon, the elasticity of demand. For example, at \$1,000 per copy of Windows 95, Microsoft would undoubtedly see dramatically lower sales, because many buyers would not be willing to purchase a PC if the price of the operating system added 50 to 100 percent to the price of a fully functional computer, or because they would then be willing and able to switch to another operating system (even though they might consider alternative operating systems inferior to Windows). At \$45 per copy of Windows 95 (the approximate price of Windows 95 for manufacturers at this writing), Microsoft's sales might be sufficiently greater in total units shipped *and* total revenues earned to make Microsoft the dominant, if not the single, seller of operating systems.

Moreover, the present dominance of Microsoft in the operating-system market can be attributed at least partially to the pricing blunders of its competitors, most notably Apple, which adopted a strategy of restricting the sales of its operating system and then tying the operating system to the purchase of Apple computers. Virginia Postrel, editor of *Reason* magazine, suggests that Apple did Microsoft a huge favor by trying to control its own operating system's market in the 1980s (Postrel 1997).

From these perspectives, one cannot know from the observation that Microsoft has an 80 percent market share whether Microsoft is acting monopolistically or competitively, and it is altogether understandable that those who accuse Microsoft of being a monopolist also accuse it of being "brutally competitive." The firm can be either, and the latter form of behavior could have resulted in its becoming a dominant seller without necessarily being a monopolist.

It cannot be stressed enough that a firm that is a single seller, or just a dominant producer, is not necessarily a monopolist, as the term is generally defined by economists,

16. As of early 1998, for example, Microsoft's Internet Explorer was used by 40 percent of the people who regularly move among sites on the World Wide Web (Cortese et al. 1998).

because all definitions of monopoly presume that the firm is capable of using its market position to restrict output and increase its prices and profits, in the process creating “market inefficiency.”¹⁷ A firm can become large either by using resources efficiently and remaining attuned to its customers’ wants or by behaving, well, as a monopolist. But in order for a firm to act successfully as a monopolist, genuine barriers to the entry of new rivals must exist. Otherwise, any firm that seeks greater profits by reducing output and raising price can expect to attract new market entrants who seek to make the sales that the established firm has not made, and which the new entrants can make by undercutting the monopolist’s price. Without barriers to entry, the price charged by the would-be monopolist will not hold, given that the market supply is not restricted.¹⁸ The output of the new market entrants can be expected to neutralize, partially if not completely, the hopeful monopolist’s attempt to restrict output.

Even if Microsoft were the *only* producer of operating systems, it may be only one of several or many *potential* producers, all of whom stand ready to enter the operating-system market (or to expand their market share) in response to profit opportunities.¹⁹ The greater the number of potential producers and the greater the ease of entry, the less able a dominant producer is to extract monopoly profits from consumers and the closer the dominant producer’s price will be to the competitive price.

The Justice Department asserts that “PC manufacturers . . . have *no commercially reasonable* alternative to Microsoft operating systems for PCs that they distribute” (emphasis added).²⁰ Such a claim about Microsoft’s current monopoly status must be tempered, surely, by the observation that, in fact, other firms exist in the operating-system market. The list of *existing* producers includes at least the following: IBM, Oracle, Sun, Apple, AT&T, Hewlett Packard, NeXT, Xerox, Wang, Be, Linux, DEC, Psion, 3COM, Geos, and GEM—and perhaps others of which we are unaware.

To be sure, those sixteen firms combined may have no more than 10 or 20 percent of the world market for personal-computer operating systems, but the listing

17. In the economists’ model of a monopoly, the “market inefficiency” (or “deadweight loss”) results because there are units of a good or service that the monopolist does not supply for which consumers are willing to pay more than those units cost to produce.

18. Antitrust authorities are not likely to challenge a merger as potentially anticompetitive unless they conclude that the merged firm could profitably raise its price by 5 (or 10) percent without attracting substantial new entry within two years.

19. The reasons given by William Landes and Richard Posner (1981, 963) for including the sales of distant sellers, however small their local sales may be currently, in drawing the boundaries of a relevant geographic market are equally apt in the case of product-market definition: “If a distant seller has some sales in a local market, *all* its sales, wherever made, should be considered a part of that local market for purposes of computing the market share of the local seller. This is because the distant seller has proven its ability to sell in the market and could increase its sales there, should the local price rise, simply by diverting sales from other markets” (emphasis in original). Hence, the important question is not how many units rival sellers of operating systems ship at current prices, but how many they would be able to ship if Microsoft increased the price of Windows.

20. Complaint, 1.

certainly establishes that Microsoft is not the *only* seller, in spite of the government's claim (which surely impugns the integrity of the government's case in this instance and others). Even if the Justice Department were correct in its assertion that "barriers to entry" exist in the operating-system market, those barriers do not justify designating Microsoft a "monopolist." Other firms are currently *inside* the market and are *potential* competitors, even if they are not, in fact, particularly effective competitors at the moment.

The Justice Department may be correct in its choice of words describing Microsoft's present market position: there may be "no commercially reasonable alternative" to Windows, and Microsoft may be responsible for that situation—but only because it has continued to operate as a competitor. If, indeed, Microsoft were a monopolist and were acting as one, it would stand to reason that a number of "commercially reasonable alternatives" would be available, because Microsoft would have elevated its price to monopoly levels and, perhaps, would at the same time have limited the power, usefulness, and ease of use of its operating system. But, then, it might not be the dominant producer that it now is.

We emphasize again that the 80 percent market share held by Microsoft does not constitute evidence of significant monopoly or market power. If Microsoft tried to increase its profits by restricting sales and raising price, then that conduct would surely entail that unmade sales would be left for the other sixteen or more existing producers, not to mention any number of other software firms that might have operating systems in storage and that stand ready to divert the time and energy of their software programmers to developing new operating systems.

The prospects of alternative existing or potential sources of operating systems must at least cause observers to wonder whether Microsoft could have achieved its market dominance by charging anything other than prices closely aligned with competitive levels. That existing competitors are not even more numerous does not necessarily speak to Microsoft's monopoly practices. Again, the absence of existing competitors could be construed as the result of Microsoft's *competitive* practices. Microsoft may be charging such a low price that other firms do not judge the development of an alternative operating system to be worth the required up-front investment. (Forty-five dollars for an operating system that incorporates millions of lines of code and is fairly powerful and easy to use does not seem like the price a monopolist would choose.) By acknowledging that no "commercially" viable alternative operating systems exist, the Justice Department seems to be conceding Microsoft's advantageous competitive position.

Clearly, Microsoft has "market power" to some degree, as do almost all firms selling in differentiated-product markets; otherwise, the Justice Department would have no reason to be concerned about Microsoft's monopoly status. But surely that power is greatly circumscribed by the economic interests of its investors—including Bill Gates—a critical component of which must be the market value of Microsoft's

stock. No one doubts that Microsoft *could* at this time or in the near future raise the price of Windows by restricting sales, with the result that its revenues might rise while its production costs declined (owing to lower output), but that course of action would not necessarily imply that Microsoft was pursuing its stockholders' best interests. The firm's revenues could in fact tumble by more than costs fell, because the quantity sold might decline proportionately more than the corresponding increase in the price as customers switched to the operating systems offered by other existing competitors.

In addition, even if profits rose immediately with an increase in the price of Windows (because revenues fell by less than costs or because revenues rose and costs declined), it does not follow that Microsoft's investors would be pleased. The price of Microsoft stock could fall simply because investors worried that a higher price for Windows would in the not-too-distant future cause a larger number of commercially viable operating systems to be shipped by other firms, with the net effect being a smaller market share and profits over the long run for Microsoft. Higher current profits, in other words, could be more than offset by lower profits in the future, an outcome all the more likely in periods, such as the 1990s, with relatively low interest rates.

Why do interest rates matter? A decline in interest rates increases the present discounted value of lost future profits, which is to say that hiking the current price is a less attractive strategy for any firm that possesses market power (or thinks it does). In other words, the lower are current and expected future interest rates, the less incentive Microsoft (or any other firm) has to exert its market control today and the more incentive it has to act competitively, that is, to hold prices low (or lower them) and increase its market share. One plausible reason why Microsoft stands accused of being such an aggressive competitor at the same time that it has been accused of being a monopolist (dominant seller) is that the firm has been responding rationally to prevailing economic conditions: low interest rates do inspire aggressively competitive current behavior, which, in turn, can make life difficult for other competitors who have to meet Microsoft's reductions in the real prices of its products. Moreover, Microsoft's competitiveness can be fortified by its knowledge that low interest rates will encourage other software firms to be more competitive in the marketplace (and more demanding of the Justice Department in the political arena).

Notably, nowhere in the Justice Department's complaint does Microsoft stand accused of raising its price, as any monopolist worthy of the name would be expected to do. The reason for the absence of a pricing charge is clear: the nominal price of Windows paid by computer manufacturers has reportedly remained constant at \$45 for the past six years. That nominal-price constancy means that the *real* price of Windows (the price adjusted for inflation) has declined during that period by about 18 percent. Actually, the real price has declined by even more, because Windows has been enhanced continuously over the past six years in terms of both power and ease of use.

Now, Microsoft proposes to incorporate Internet Explorer into Windows at no added cost, which is an indirect way of lowering the real price of Windows once again. Such reductions in the real price of a product are not what would be expected in the light of textbook treatments of monopoly. They are what would be expected of a competitive firm that sees important economies for consumers, as well as for the firm itself, from gaining market share.²¹

To be sure, the price of Windows might be higher than it could be, and one might argue that it should have fallen by more than it has in recent years. But we cannot help wondering how the Justice Department or the cooperating state attorneys general can know that to be the case. If the price of Windows were materially higher than it *should* be, then it would follow that Microsoft's sales would be materially restricted, as would be its share of the operating-system market. That restriction would occur because existing or potential competitors would be able to invade the operating-system market, lowering their prices below that of Windows, expanding their sales, and increasing their profits. With competitors already in the market standing ready to take advantage of any attempt by Microsoft to charge prices in excess of cost, and in the absence of barriers to the entry of new rivals, Microsoft's prices must be closer to the competitive price than to the monopoly price.

The Special Case of “Network Effects”

Critics are usually eager to concede that Microsoft may not be a garden-variety monopolist. They are quick to reason that Microsoft does not behave as most traditional monopolies behave because the market for computer software, especially operating systems, differ from those for more mundane products. Textbook monopolies are assumed to face static demands that are independent of past or prospective future consumption levels. That is to say, future demand does not rise with greater current consumption, and vice versa.

By contrast, the market for computer programs is said to exhibit “network effects” or “network externalities.” Thus, the value of a product to any one person depends on how many other people use it: the larger the number of people who use a program, the larger is the program's individual and collective value, and hence the larger will be the number of people who buy it (Rohlf's 1974; Katz and Shapiro 1985; McAndrews 1997). Therefore, the future demand for the product can be expected to rise with current purchases, which implies that even a monopoly firm in such an industry has a reason not applicable to traditional monopolies (absent network externalities) for keeping current

21. Granted, the nominal price of Windows sold in retail stores may have doubled since the start of the decade. We focus here on the price of Windows sold to computer manufacturers because Microsoft's deals with the manufacturers are the focus of the Justice Department's suit. Moreover, considering all the added features of Windows and the greater ease of use, it is hard to conclude that the real price of Windows, even at retail outlets, has risen.

prices low: in so doing, the monopolist can stimulate future demand and, when the increased demand materializes, elevate the profit-maximizing price.

Moreover, the greater the firm's market share, the greater the incentive the firm has to hold its current price down. In the presence of network externalities, all of the additional future sales stimulated by today's low prices accrue exclusively to the dominant firm; that is, the benefits of stimulated future sales do not spill over to other producers as they would in a textbook perfectly competitive market, in which the products of rivals are perfectly substitutable. The dominant producer can increase its dominance simply because everyone expects its dominance to grow. If consumers do benefit from network externalities, they will want to join the dominant producer's network because their expectation of its (growing) dominance implies greater future benefits.²²

The Justice Department's lawyers and Microsoft's critics reason that setting a low (if not falling) current price, or even a zero price, is behavior consistent with the actions of a profit-maximizing monopolist, given the existence of network effects. Low prices today can lead not only to more sales today and even greater sales in the future, but a firm's low prices can fuel consumer expectations of its dominance that, independent of today's price, can contribute to the firm's dominance today and in the future. Accordingly, the Justice Department can argue that it must act now to avert monopoly pricing and output restrictions in the future.

Although such an argument may sound appealing, it has weaknesses that must be kept in mind.²³ The argument rests on the presumption that when the future rolls around, the monopoly firm—Microsoft in this case—could actually restrict sales and would want to do so with its stockholders' interests in mind.²⁴ Such a scenario, in turn, presumes that the firm no longer faces effective competition from existing or potential rivals because it has a hammerlock on its buyers.

22. Network externalities do not rule out competition. There can be competing networks based on incompatible operating systems. Moreover, any given network need not be served by only one operating system. Any number of firms can sell to the same network so long as the operating systems are compatible (Katz and Shapiro 1985; Farrell and Soloner 1986). In this case, any attempt by Microsoft to charge a monopoly price could inspire other firms to devise different but compatible operating-system software, which would allow their customers to tap into the established network at a lower, nonmonopoly price.

23. For an extended critique of "network externalities" in the context of Microsoft's earlier encounter with the antitrust agencies, see Lopatka and Page (1995).

24. The Justice Department has not explicitly charged Microsoft with predatory pricing, perhaps because the courts have stated on several recent occasions that they regard predation—charging prices below cost with the object of bankrupting a rival—to be a rare event. See, for example, *Cargill, Inc. v. Montfort of Colorado, Inc.*, 479 U.S. 104 (1986); *Matsushita Electrical Industrial Co. v. Zenith Radio Corp.*, 475 U.S. 574 (1986); and *Brooke Group Ltd. v. Brown and Williamson Tobacco Co.*, 113 Sup. Ct. 2578 (1993). All of these cases failed because the plaintiff was unable to convince the courts that the alleged predator could plausibly be expected to recoup its lost profits by restricting output and raising price after the prey had been forced from the market. The Justice Department's stated concern is that Microsoft's practice of bundling Internet Explorer with Windows represents an unlawful restriction of consumer choice.

The future price of the operating system might indeed be increased, but such a price hike could be expected by consumers even in a fully competitive market. The reason has already been given in the case for preemptive antitrust action: network effects. The existence of such externalities implies an unsustainable low current price kept down in order to generate the network effects that will increase the program's value to its users, which in turn will lead to a higher market price at some later date simply because of the implied future increase in demand. A higher future price would not necessarily mean that the consumers were being exploited. They might pay more for the program in the future, but they then would also be getting more value because of the larger number of people using it. Indeed, given the existence of network externalities, consumers would recommend the same time-wise pattern of prices the firm's owners would want, namely low (even below-cost) prices today—in order to build the network benefits—followed by higher prices in the future.

Moreover, the prediction that Microsoft will be able to raise its price in the future is nothing but sheer speculation by the Justice Department's lawyers and other critics. Microsoft would still face the *threat* of competition unless some pretty strong barriers obstructed the entry of new firms. The existence of network effects in the market for operating systems not only encourages low current prices. Those effects simultaneously cut the gains any single seller can expect from raising its future price substantially, because network effects also enhance the potential benefits to new entrants from entering the market and undercutting the pricing of the incumbent "monopolist." Today's dominant seller—Microsoft—must worry that network effects will work in reverse: a higher price in the future would not only curb sales at that time but would also cause current sales to fall in anticipation of the higher future price. Of course, when the future price is raised, sales would fall from that point forward because the then-reduced sales imply fewer network benefits for consumers. New entrants can reason that the gains from entry will be accumulating, with then-current sales leading to even higher future sales beyond that point. As a consequence, network effects do not necessarily lead to a greater likelihood that a firm will take advantage of any existing monopoly power; indeed, just the opposite might as well be expected.

The network externality argument rests on an assumption of consumer rationality that cannot be restricted to consideration of the impact of today's low prices on future market dominance. Consumers must also be expected to anticipate, in a rough and ready way, the monopoly price the dominant producer might charge in the future. The very anticipation of that higher future price would at least weaken the ability of the firm to charge a monopoly price in the future, because rational consumers—especially large corporate customers with large financial consequences riding on their buying decisions, both now and in the future—would curtail their purchases at current prices, buying more of the products of the future would-be monopolist's rivals in order to forestall the possibility of being exploited in the future.²⁵ But even if consumers' behavior were not forward-looking, the dominant firm would still hesitate to charge

a future price substantially in excess of cost because the network externalities would have been achieved and, for the reasons just stated, such a strategy would invite competitors' entry into the market.²⁶ A dominant firm facing network externalities would not want to be perceived as capable of extorting monopoly prices and profits. Such a perception would reduce its ability to attain the market share and, hence, to exploit the economies of scale in production that it finds most profitable.

Understandably from this perspective, Microsoft might be pleased that alternative operating systems are available, even though they may not now be "commercially reasonable," to use the Justice Department's characterization. Given the existing network externalities, the mere existence of OS2 (IBM's operating system), marketed by a large firm, can provide assurance that Microsoft does not (and will not) act as a monopolist—an assurance that can add to Microsoft's dominance. For that matter, the Justice Department's current antitrust action can increase Microsoft's current dominance of the market, because the suit offers an added measure of confidence that Microsoft will not act as a monopolist in the future.

When Apple was facing serious financial difficulties in 1997, Microsoft invested about \$150 million in its rival. We suspect that Gates approved the investment for three reasons: First, the investment would help assure consumers that Microsoft's monopolistic tendencies would continue to be kept in check. Second, the investment would help keep the Justice Department's antitrust lawyers at bay (or so Microsoft may have reasoned). Third, Apple's sales strategy, which ties the sale of its operating system to the sale of its hardware, will likely ensure that Apple never becomes a dominant seller of its operating system. Many computer buyers must understandably worry that Apple will try to use its customers' well-known loyalty to its operating system to increase the prices of its hardware. Microsoft's dominance in the market for operating systems may be partly the result of Apple's strategy and partly the result of Microsoft's alternative strategy of letting consumers buy their PCs from independent hardware vendors, a strategy that helps build the network effects supposedly at the foundation of Microsoft's monopoly.

The foregoing discussion of network effects presumes that substantial networking effects exist for a program such as Windows 95. But the existence of substantial network effects for individuals working together is not obvious to either of the authors, and we both work extensively with our computers. Granted, some networking externalities may exist for each of us and for our respective academic institutions. Papers can be passed

25. We are not suggesting here that the free-rider problem is totally abated by buyers rationally switching to competitors in anticipation of monopoly prices in the future. Rather, we are suggesting that the free-rider problem is mitigated by the private incentives built into the network externality framework.

26. Microsoft's opponents argue that new entry would be forestalled by consumers' costs of switching to an alternative operating system, even if the alternative were superior technologically. This idea of "path dependence" we shall discuss later.

around more easily among faculty members (and students), and the local computer staff has to keep up to date on only a single operating system. However, we are not convinced that the network externality argument applicable to a school or a department can be extended ad infinitum or even to the limits of the computer market. We see practically no benefits from both authors having the same operating system.

Indeed, when we agreed to write this paper jointly, we did not ask one another about computer operating systems. Of course, we might have anticipated some minimal gains from both using Windows and Microsoft Word, but the anticipated benefits of collaboration were never materially influenced by the prospects that we both would use Windows and Word. (Indeed, only after writing this section of the paper did we discover that both of us use Windows.) If our experience is shared by many others, it seems reasonable to conclude that a relatively small increase in the price of Windows 95 would materially affect sales, and vice versa, which suggests that Microsoft's monopoly power must be tightly constrained. It also seems reasonable to deduce that Microsoft has a large market share only because it has not been charging anything close to the proverbial monopoly price.²⁷

Granted, the Justice Department's suit rests on the argument that, in fact, barriers to entry exist in the operating-system market because of "economies of scale" and "network effects." PC consumers will tend to buy the operating system with the "greatest number, variety, and quality of applications," and PC programmers will write programs for the "most commonly used operating system, in order to appeal to as many potential customers as possible."²⁸

What the Justice Department's lawyers do not seem to understand is that Microsoft probably could never have achieved its market dominance had it behaved as a monopolist in the past or showed signs that it would act as a monopolist in the future (which is now the present). Similarly, if it were to indicate that it was going to act as a monopolist in the future, leading to the likelihood that its dominance of operating systems would erode, software developers would surely anticipate that development in their program writing and marketing plans. Hoping to take advantage of network effects operating in reverse, rival producers of operating systems would have incentives to absorb at least some of the costs of switching for the software firms and consumers. However, by continuing to lower the real price of its operating system and to upgrade it by including a Web browser free of charge (among other enhancements), Microsoft

27. Maybe the price for Windows 95 is not as low as the price that would be charged by the so-called perfect competitor, but that is hardly an indictment of Microsoft's pricing strategy, given that perfect competition has always been recognized as nothing but a theoretical construct designed to be used for predicting the direction of market changes, not as a description of any real-world market. By the nature of the assumptions made, the perfectly competitive price is simply not achievable, which can be said with equal conviction about the pure monopoly price.

28. Complaint, 19.

is giving software firms all the more reason to write applications for Windows, which in turn adds to Microsoft's market dominance, but not necessarily to its monopoly power.

The Justice Department reasons that Microsoft's "exclusionary agreements," which require computer manufacturers to install only Windows and only Internet Explorer and do not allow computer manufacturers to alter the screen sequence as Windows boots up, is anticompetitive and anti-consumer. But such is not necessarily the case, if the Justice Department believes its own claims about extensive network effects. The network has benefits to software manufacturers and consumers only to the extent that it holds together. The exclusionary agreements and contract clauses that prevent changes in the starting screen sequence can be interpreted as providing such assurance. Software firms and consumers can thereby readily see the collective gains to be had from joining the Microsoft network.

By what theory of antitrust injury must Microsoft be compelled to advertise the products of its competitors by allowing computer makers unilaterally to make alterations in the first screen the user sees when he boots up (and which the end-users are themselves free to alter in any case)? And if Internet service providers, such as America Online, and Internet content providers, such as the Disney Channel, want to place their logos and links on the first screen the user sees when Windows is shipped from the factory (and which the users are subsequently free to add or delete to suit their own tastes), why must Microsoft be prevented from asking for something in return by insisting that those content providers not enter into similar arrangements with its competitors?

If extensive network effects exist, as claimed by the Justice Department, then those effects must have been produced by Microsoft's years of successful product development and marketing. We understand why other firms, including Netscape, would want to free-ride on Microsoft's considerable investments in the development of the network, but giving some firms a free ride hardly justifies asserting that the developer of the network is a monopolist and that antitrust action is an appropriate means of granting the free ride. Limiting, by antitrust action, the rights to the use of the most valuable real estate in cyberspace risks making the whole sequence of investments unprofitable and, hence, chilling the efforts of future high-technology pioneers.

Three concerns should be kept in mind when evaluating the charge that Microsoft's exclusionary tactics are calculated "to preserve its world-wide monopoly in operating systems by stifling companies whose technology would compete" (Bork 1998). First, even if the courts forbid the "forced" installation of Internet Explorer, the Justice Department has not materially affected whatever monopoly power it might imagine Microsoft has. Consumers get no net benefit. If Microsoft is the monopolist it has been acclaimed to be, then it can compel the installation of Internet Explorer (if adding the program is a net burden) only by lowering the price it charges computer manufacturers for Windows.²⁹ In other words, it must use up some of its monopoly profits

from selling operating systems to force the manufacturers to do something they supposedly do not want to do. Forbidden to insist on the installation of Internet Explorer, Microsoft is free to reverse its action, jacking up the price of Windows because the manufacturers no longer have to incur the ostensible added costs of installing Internet Explorer.

Second, the remedies the Justice Department seeks might actually lower the network benefits to application software writers and consumers if they do what they are intended to do, namely, reduce Microsoft's dominance in the operating-system market. Although such actions clearly would be a boon to Microsoft's competitors, the advantages for consumers are not so clear.

Third, a Justice Department victory could induce Microsoft to develop a monopoly-like pricing and product-development strategy simply because its property rights to its operating system and to the computer "desktop" would be compromised. Microsoft might reason that a policy of lowering its price, enhancing its products, and maintaining its operating system's acceptability as an industry standard would only add to its future legal bills, a prospect that could lead Microsoft to reduce its market share by hiking its current and future prices and curbing future product enhancements, with the intention of elevating its profits above what they would be if it had to incur the legal bills.³⁰

Microsoft appears ready to incur those legal bills, though. Defending his "right to innovate," Gates broke off settlement negotiations at the eleventh hour when he balked at the Justice Department's demand that Netscape's Web browser be included in every unit of Windows shipped (Gates 1998). That proposed "remedy" proves once again that antitrust is mainly about protecting competitors, not about enhancing the welfare of consumers.

29. Indeed, Assistant Attorney General Joel Klein (1998a, 17) admitted as much recently when he asked rhetorically, "But if the products are tied together and sold at a single price, how can anyone say that the browser is free?" In other words, Microsoft might just as profitably charge \$45 for Internet Explorer and give Windows away, provided that purchasers of Internet Explorer are required also to purchase Windows. It cannot charge more than \$45 for Windows and Internet Explorer combined unless the combination is worth more than \$45 to consumers. We shall return to this issue.

30. If the property rights of producers of a product without network effects to their future income streams are threatened by pending regulation or antitrust action, then those producers have an incentive to unload their holdings of the product as quickly as possible. For example, if the rights of a oil-drilling firm to its oil wells are threatened, then it is in the interest of the oil-drilling firm to pump oil as rapidly as possible, thereby putting downward pressure on the price of oil. On the other hand, if the property rights of a firm producing a product characterized by network effects are threatened, then higher prices can result. In the absence of the threatened property rights, network effects provide incentives to hold prices down in order to build the network effects that boost its future income stream. However, when property rights to the future income stream are threatened, the firm no longer has the same incentive to keep current prices low. For an extended discussion of how firms can be expected to react when their property rights are threatened and their market is characterized by "lagged demand" (which implies network effects), see Lee and Kreutzer 1982.

The Confused Economics of the Microsoft Case

Microsoft's critics have advanced a number of economic theories to explain why the firm's behavior has violated the antitrust laws. None of those critics has articulated why or how consumers have been harmed in the process. Instead, the furious attacks on Microsoft have focused on the injuries supposedly suffered by rivals (on account of Microsoft's pricing and product-development strategies) and by computer manufacturers and Internet service providers (on account of Microsoft's "exclusionary contracts").

Tie-in Sales

One of the fundamental antitrust charges against Microsoft is not that it is a monopolist as such, but rather that it has unlawfully used its dominance of the market for computer operating systems as leverage to force computer manufacturers to install its Web browser, Internet Explorer, as a condition of loading Windows on all the units they ship. The Clayton Act made such tie-in sales illegal on the theory that they foreclose competitive market opportunities. The sellers of rival Web browsers are placed at a disadvantage, it is alleged, because Microsoft has contractually locked a large percentage of their potential customers into its own Web-browsing software product. If Internet Explorer is preloaded onto all of the new computers shipped with Windows on board, Microsoft will have an unfair edge as consumers decide what Web browser to use.³¹ The normal workings of a free and open competitive marketplace will thereby be short-circuited, and Microsoft will have compounded its monopoly by extending it from the market for the "tying good" (operating system) to the market for the "tied good" (Web browser).

Ever since section 3 of the Clayton Act made it unlawful for sellers to condition the sale or lease of one product on the purchase of another, the courts have taken an extremely hostile view of such contractual agreements. Indeed, in 1958 the Supreme Court declared tie-in sales to be illegal *per se*,³² meaning that the legal test for finding a law violation does not require evidence of consumer injury—the plaintiff must show only that a tie-in sale has been employed in a factual situation "where the effect may be to substantially lessen competition or tend to create a monopoly." Even earlier, the Court stated flatly that tie-in sales "serve hardly any purpose beyond the suppression of competition."³³

31. In *International Salt Co. v. United States*, 332 U.S. 392 (1947), the court reasoned that even though International's contracts tying the sale of rock salt to the lease of its patented brine-making machine, the Lixator, allowed customers to buy their salt elsewhere if International could not meet a competitor's lower price, consumers were still harmed by the priority on salt purchases the contracts gave to International: "A competitor would have to undercut appellant's [International Salt's] price to have any hope of capturing the market, while appellant could hold that market by merely meeting competition."

32. *Northern Pacific Railway Co. v. United States*, 356 U.S. 1 (1958).

33. *Standard Oil Co. v. United States*, 337 U.S. 293 (1949).

The Supreme Court has said that four conditions must hold before a tie-in sale can be deemed to violate the Clayton Act's proscription:³⁴ First, the tying arrangement must involve two distinct products. Second, the sale of one these distinct products must effectively be conditioned on the purchase of the other. Third, the seller must possess market power with respect to sales of the tying good "sufficient" to impose its will on customers.³⁵ Fourth, the volume of commerce foreclosed in the market for the tied good must be "not insubstantial."

With the possible exception of the Court's first condition, the facts at hand seem to support the Justice Department's charge of unlawful tying against Microsoft. It is uncontested that Microsoft has an impressive share of the market for computer operating systems. Can we therefore conclude that, by acting monopolistically, Microsoft is capable of "foreclosing" a substantial volume of commerce in the market for Web browsers if operating systems and Web browsers are in fact distinct products sold in two separate markets?

The answer is clearly no. Except under very restrictive conditions—conditions that do not hold in the case of computer operating systems and Web browsers, which must be used in "fixed proportions"³⁶—a monopoly cannot be compounded. Consider the facts in one of the Justice Department's early attempts to corral "monopoly" in a high-technology industry. Before the advent of mainframe computers, IBM was the dominant manufacturer of tabulating machines used to sort and compile information entered on cardboard punch cards. Very much like its present-day rival, the firm imposed a requirement on its customers that, as a condition of renting IBM's tabulating machines, they also must purchase all of their punch cards from IBM. The Justice Department sued, charging that IBM had unlawfully used its "monopoly" of tabulating machines as leverage to obtain a monopoly of punch cards, and the Supreme Court ultimately agreed with the decision of a lower court that found the firm guilty of violating Clayton Act section 3.³⁷

The Justice Department's extension-of-monopoly theory was implausible, however. As pointed out by Aaron Director (Director and Levi 1956), IBM's attempt to obtain an additional source of profits by restricting the output and raising the price of punch cards would be frustrated by reduced sales of tabulating machines. That

34. *Fortner Enterprises v. U.S. Steel Corp.*, 394 U.S. 495 (1969).

35. Indeed, because a firm operating in a hypothetical perfectly competitive market would quickly lose sales to rivals that did not impose requirements such as these on their customers, the mere existence of a tie-in sale is often taken as *prima facie* evidence that the seller must possess market power in the tying good.

36. Nuts and bolts supply a textbook example of the fixed-proportions case: a bolt is useful as a fastener only if it is secured by a nut, and a nut has no value except when used in combination with a bolt. Similarly, a Web browser cannot be used in the absence of an operating system; an operating system is worthless without software applications such as browsers and word processors.

37. *International Business Machines Corp. v. United States*, 298 U.S. 392 (1936).

conclusion is reached if one recognizes that IBM's customers were not buying cards or machines, they were buying tabulating *services*—the “market” for punch cards was not distinct from the “market” for tabulating machines in any meaningful sense. How the individual inputs entering into the production of those services were priced was essentially irrelevant. If IBM raised the price of one input, the cards, the per-unit cost of tabulating services had increased, and accordingly customers would have bought both fewer cards and fewer machines. Moreover, if the tabulating machines had been priced optimally (at the profit-maximizing level) beforehand, any increase in the price of punch cards would have raised the total price of tabulating services above the optimal level, which would have tended to lower, not raise, IBM's overall profits.

Director suggested that IBM's practice of requiring users of its tabulating machines also to buy their punch cards from IBM made economic sense only as a method of price discrimination—a strategy of selling the same product to different customers at different prices. By imposing such a requirement, IBM could use punch-card purchases to “meter” the demand for tabulating machines. Under this theory, customers who placed relatively high values on data-tabulating services would use the tabulating machines more intensely and hence require more punch cards per week than other customers, for whom tabulating services had less value. By selling more cards to customers in the former group, IBM would effectively charge them a higher price per unit of data-tabulating services. Customers in the latter group, who, by assumption, required fewer cards, would pay lower combined prices for these services. Thanks to its ability to align prices of data-tabulating services with consumer valuations by requiring customers to buy its punch cards as a condition of renting its tabulating machines, IBM increased its total profits over and above those earned under the alternative policy of only leasing tabulating machines and doing so at the same price for all of its customers.

Price-discriminatory demand metering is not the only reason why a firm might want to tie the sale or lease of one product to the purchase of another. Nor does that explanation fit the circumstances at issue here, where operating systems and Web browsers are used in fixed one-to-one proportions. But Director's main point holds: because Microsoft, if it is a monopolist, can extract maximum monopoly profits with simple monopoly pricing of its operating system alone, it would be irrational simultaneously to charge a monopoly price for its Web browser, which requires an operating system to be useful. Any attempt by Microsoft to increase the price of its Web browser over the competitive price would, if Internet Explorer and Windows are sold as a bundle, reduce the demand for its operating system. Microsoft would then sell fewer copies of Windows. But if doing so had been a profitable strategy to begin with, Microsoft could have accomplished it without going to the trouble of developing a Web browser; it could simply have reduced the output and raised the price of its operating system. Hence, if there is a monopoly here, the monopoly resides in Windows alone. And, as Director explained, that monopoly cannot be compounded. Software applications such

as Internet Explorer can provide an additional source of profits to Microsoft only to the extent that they make the underlying operating system more useful to consumers and hence give rise to more, not fewer, sales. The additional profits arise not from “monopolizing” the market for applications but from creating value.

The weaknesses of the extension-of-monopoly theory perhaps explain why the Justice Department and Microsoft’s many other critics have recently begun to emphasize alternative reasons for government regulators to curb the firm’s supposed monopoly power.³⁸ Microsoft’s practice of bundling Internet Explorer with Windows, it is said, unfairly restricts consumers’ freedom to choose among competing Web-browsing software products, and government must intervene to restore that freedom by curtailing the firm’s exclusionary practices.

Path Dependence

The freedom-of-choice theory is reinforced by contentions that the alternatives available to consumers can be *path dependent*, that is, a function of the choices they made at earlier dates. Path dependency is claimed to be a particularly relevant consideration in industries characterized by network externalities, where the adoption of a common technological standard is often a prerequisite for exploiting the benefits that make connection to the network valuable. Once products embodying a particular technological standard are chosen by a sufficiently large number of consumers, however, a “tipping point” may be reached at which products based on alternative (but incompatible) standards, perhaps even technologically superior products, no longer represent viable sources of competition. Beyond the tipping point, sales of products embodying the accepted technological standard quickly come to dominate the market because of the large benefits from connecting to the established network and because it is too costly for consumers to switch to alternative technologies—network benefits would be lost unless enough other consumers simultaneously switched. But consumers cannot coordinate their choices. The path that brought one technology to the fore cannot easily be reversed, and the fortunate seller whose products rely on the accepted standard ends up with market power that it might then exercise to raise prices and profits at consumers’ expense.

A great deal of ink has been spilled recently on two popular examples of supposed path dependency. One is the story of the “QWERTY” typewriter keyboard, so called in reference to the order of letters beginning at the top left of the keyboard’s second row. That particular arrangement of letters was supposedly introduced in the early

38. Robert Bork, one of the lawyers representing Netscape and an important contributor to the literature critical of “leverage” theories (Bork 1978), concedes that Microsoft “makes no additional monopoly profit” by tying Internet Explorer to the Windows operating system (Bork 1998). He goes on to say that “in fact, the tactic costs money because Microsoft prices its browser at zero.”

days of typewriting as a way of solving a mechanical problem of keys overstriking one another and becoming physically jammed. According to legend, a rival keyboard later invented by August Dvorak is vastly superior to the QWERTY keyboard, yet QWERTY remains in common use because typists and typewriter manufacturers cannot overcome path-dependent inertia: typists do not train on the Dvorak keyboard because virtually none exist, and virtually no Dvorak keyboards are manufactured because too few typists can use that keyboard. The implications of the story for computer operating systems seem obvious. Given that Windows is installed on 90 percent of the new computers shipped, writers of software applications have strong incentives to make their programs compatible with Microsoft's operating system. Applications for alternative, perhaps "vastly superior" operating systems are not written because not enough of those alternative systems are in use, and virtually no alternative operating systems are in use because too few software applications are written for them.

Fortunately for typists and computer operating system users, however, the QWERTY story is flawed. A carefully researched study of the evolution of typewriter keyboard standards has shown that Dvorak's invention is not in fact markedly superior to QWERTY and, moreover, that "the continued use of QWERTY is efficient given the current understanding of keyboard design" (Leibowitz and Margolis 1990, 2). The accepted standard was not displaced simply because the benefits of switching to the challenger were less than the costs.

More generally, adherence to an inferior standard in the presence of a superior one is inconsistent with the normal workings of a freely functioning competitive marketplace, which presents profit opportunities for alert entrepreneurs who solve the coordination problem. Because switching to superior technologies increases the value to consumers of the products embodying them, manufacturers have strong incentives to see that they find a market. If the Dvorak keyboard had indeed been "vastly superior" to QWERTY, raising significantly the productivity of the typists who used it, then typewriter manufacturers could have sold more typewriters. They would then have had incentives to help users overcome the inertia of using the old standard by bearing some of the costs of switching, which they could have done in a variety of ways, including offering discounts to early adopters of the new standard, providing guarantees of satisfaction, making the new products available on a rental basis, granting rebates to customers who exchanged equipment embodying the old standard, or subsidizing training on the new equipment (Leibowitz and Margolis 1990, 4–5).³⁹ Some of the costs of switching also would have been internalized by end-users. Though individual typists might have been deterred from adopting the new technology because the costs to them personally exceeded the expected benefits, firms that employed large numbers of typists would, if the Dvorak keyboard were in fact superior to

39. Indeed, according to Leibowitz and Margolis (1990, 5), "typewriter manufacturers were an important source of trained typists for at least the first fifty years of that technology."

QWERTY, have had incentives to coordinate the technology choices of their employees in order to capture the productivity gains of adopting the new standard.

In short, a variety of market-based institutions exist that promote the displacement of obsolete technologies, including those beset by network externalities and superficially irresolvable coordination games. As a result, “observable instances in which a dramatically inferior standard prevails are likely to be short-lived, imposed by authority, or fictional” (Leibowitz and Margolis 1990, 4).

Fiction has likewise displaced fact in retellings of the second popular example of path dependence—the market’s selection of VHS-formatted videocassette recorders over the now obsolete Betamax format. Claims of the technological superiority of Betamax over VHS are not only routinely overstated, but in fact VHS has an edge on a dimension of product performance of great value to consumers, namely, the length of the programs that can be recorded on a single tape. VHS formatting made it possible to record a movie-length program on one videocassette, an innovation that spawned a wholly new home-entertainment industry. Such a development would not have been possible if Betamax formatting, with its more limited recording time, had become the industry standard. Hence, despite Betamax’s two-year head start over its rival, the market apparently made the “right” technology choice.⁴⁰

Antitrust concerns about the possibility of path dependency in high-technology industries seem misplaced. Microsoft cannot rely on consumer “lock-in” to continue to dominate the market for computer operating systems. If a superior alternative to Windows is written by a rival software developer, Windows will be displaced. Given the threat of such potential competition, Microsoft’s continued market dominance depends on its ability continuously to improve its operating system by, among other things, making it more reliable and integrating more applications with it in order to reduce consumers’ costs of searching for, purchasing, and installing compatible software products. In so doing, Microsoft has incentives to see that users of older versions of Windows upgrade to newer versions. To help solve the coordination problem and overcome consumer inertia, it offers discounts on software upgrades, allows users to experiment with (“beta-test”) new software products before their formal release, gives new applications away, makes programs “backward compatible” so that files created with obsolete versions can be read by newer versions, and enters into contracts with computer manufacturers requiring them to install the same operating system on all units shipped. Although some of these actions may, in the eyes of Microsoft’s rivals, seem “brutally competitive,” they are competitive. To paraphrase Joseph Schumpeter (1950, 84), Microsoft’s practices are best understood not as elements of an orchestrated attempt to exploit a market structure in which, for the moment, it holds a commanding lead, but rather as attempts to deal with a situation sure to change presently—attempts to keep on its feet, on ground constantly slipping from under it.

40. As reported in “Microsoft: Economic and Legal Perspectives on Antitrust and Monopoly” (1998).

“Essential Facilities”

Ignoring the history of an industry in which the Schumpeterian “gale of creative destruction” has blown hard, Microsoft’s critics (and the Justice Department’s lawyers) lately have been studying the possibility of declaring the Windows operating system an *essential facility*, “and then devising rules that ensure all players have equal access to it. The idea would be to give all software makers the same information about the codes that make up Microsoft’s operating system that its own software developers have, and at the same time” (Murray 1998).⁴¹

The essential facilities doctrine originated early this century in an antitrust case that challenged the ownership by a group of railroads of all the bridges spanning the Mississippi River at St. Louis.⁴² More recently, concerns have been raised about the possible anticompetitive effects of analogous bottlenecks in telecommunications networks.⁴³ For example, under existing technological and regulatory constraints, customers can be reached only if calls or data streams are routed through the local telephone switch. The essential facilities doctrine suggests that the owner of such a facility has incentives either to deny competitors access to the facility or to grant them access only at discriminatorily high prices. For example, if the local telephone company owns the switching equipment essential for connecting to its customers and if, furthermore, it supplies both local and long-distance telephone services, then it might deter the entry of rival long-distance companies. By charging competitors access fees substantially in excess of the cost of providing such access, the local telephone company’s own long-distance service affiliate would enjoy an unfair competitive advantage, enabling it to charge higher rates to long-distance customers than it could charge if all competitors had access to the essential facility on the same terms.

Similar reasoning suggests that, because compatibility with the Windows operating system is, given Microsoft’s dominant market share, essential for the developers of application software to gain access to computer users and because Microsoft is also in the business of writing application software, Microsoft has incentives to make it difficult for rivals to develop programs that run on Windows. Although it is undoubtedly

41. John D. Rockefeller, Sr., once said that he knew “of no parallel case in other branches of business where the competitor felt injured because he could not use his rival’s capital and facilities for his own advantage and the disadvantage of the owner of the capital and facilities” (quoted in Chernow 1998, 169). Now we apparently have at least one other example.

42. *U.S. v. Terminal Railroad Association of St. Louis*, 224 U.S. 383 (1912). See Reiffen and Kleit 1990. The authors argue that the owner of an essential facility has no incentive to prevent rivals from having access to it.

43. The Justice Department’s investigation of the proposed merger between MCI and WorldCom apparently centers on the concern that the new firm would control about half of the access points to the Internet.

true that having access to the operating system's code makes it easier to write applications that take full advantage of that system's capabilities, it is also true that the operating system becomes more valuable the more applications exist for it. Indeed, as previously noted, a computer operating system is worthless without software applications. Therefore, Microsoft has no motive for discouraging the development of new applications or blocking the improvement of existing ones. At the same time, however, Microsoft would not have introduced Windows in the first place without reasonable assurance that the returns from selling the operating system would be sufficient to recover the costs of product development. Mechanisms for appropriating the returns to R and D are essential for spurring innovation. One such mechanism is preventing the underlying computer code—a trade secret Microsoft would obviously find more difficult to keep if large numbers of independent software developers had access to it—from being copied by imitators. Writing and selling software applications is another such mechanism. By so doing, Microsoft captures more of the value that applications add to the operating system—value the firm would otherwise be required to share with independent software developers.

In short, whatever diseases may be said to result from Microsoft's comparative advantage in writing software applications for its own computer operating system, the cure would surely be worse. Ordering the firm to share its trade secrets with rival software developers would, by reducing the returns to R and D, make the whole sequence of events that led to the development of Windows unprofitable. Even though those investments have already been made and, hence, the current version of the operating system would continue to be sold—provided of course that revenues exceed variable costs—there would be a chilling effect on incentives to search for new technologies in this and other industries where for similar reasons government might see fit to expropriate the intellectual property of innovative firms.

The Political Economy of Antitrust Policy

If Microsoft is simply a firm with a large market share and not a monopolist, according to the proper economic definition of that term, what explains the nearly five-year-long antitrust pursuit of the company? Why was Bill Gates recently hauled before Congress to defend himself against an obviously hostile Senate committee? The answer is that a law declaring it illegal to condition the sale of one product on the purchase of another “where the effect . . . may be to substantially lessen competition or tend to create a monopoly” is also a law that the accused firm's rivals can use to short-circuit the competitive market process. Faced with the threat posed by an aggressive competitor, rivals can respond by improving their own products, lowering their prices, or increasing their promotional efforts. Through such responses, freely functioning markets enhance the welfare of consumers and increase the wealth of nations. Alternatively, the rivals can respond by filing a lawsuit charging the aggressive competitor with various

antitrust violations. What better victory for them than a court decision ordering Microsoft to stop behaving so competitively, to raise its prices, or to remove useful features from its core product?

The latest legal attack on Microsoft, spearheaded not by consumers but by James Barksdale, the president of Netscape, Microsoft's chief competitor in the Web-browser market, is not the first time political pressure has been brought to bear to influence anti-trust action against Microsoft. Indeed, the Justice Department's decision five years ago to open its own investigation of Microsoft was both unprecedented—coming only after the Federal Trade Commission had, on tie votes, twice failed to issue an antitrust complaint against the firm—and politically inspired. The Justice Department's intervention occurred following several telephone calls from Capitol Hill to Anne Bingaman, President Clinton's first assistant attorney general for antitrust. As the *Wall Street Journal* reported,

because Ms. Bingaman's request for FTC documents followed prodding by two senators, her action "does appear to have taken on a bit of the political aspect," [former Assistant Attorney General for Antitrust] Mr. [Charles] Rule said.

But if it's political, it's also bipartisan. Sen. Howard Metzenbaum (D., Ohio), chairman of the Senate Judiciary Committee's antitrust subcommittee, and Sen. Orrin Hatch, the ranking Republican on the full committee, both have urged Ms. Bingaman to examine the Microsoft case. (Davidson 1993)

The *Journal* did not report, though other publications did, that the headquarters of two of Microsoft's major competitors at the time, Novell Corp. and WordPerfect, Inc., were both located in Utah, the state Orrin Hatch represents in the Senate (McChesney and Shughart 1995, 344).

Only recently have economists begun to recognize that antitrust policy operates in much the same way as do other forms of government regulation, which are widely understood to be vulnerable to "capture" by well-organized special interest groups (Shughart 1990; McChesney and Shughart 1995). In the interest-group theory of government, politicians have incentives to respond to self-serving complaints of unfair competition because, given the greater financial stake of uncompetitive firms in policy outcomes, the demanders of protection can lobby more effectively than the politically ill-organized consumers who will bear the costs of competition-thwarting intervention in the form of higher prices and lower product quality. That political bias in favor of private interests, as opposed to some conception of the "public interest," is reinforced by a body of law that supplies a broad mandate for attacking loosely defined "monopolies" and by a cadre of antitrust law enforcers who, failing to appreciate the powerful, dynamic forces that pressure firms to seek new ways of catering to consumers' wants and to keep prices in line with costs, lack confidence in free-market institutions.⁴⁴

The conviction that antitrust laws serve as a bulwark of free enterprise rests not on careful studies showing that enforcement of those laws has actually promoted competitive market conditions—the historical record contains no such evidence.⁴⁵ Rather, the idea that the laws have fulfilled their stated purpose of protecting consumers from the abuses of monopoly rests on wishful thinking that antitrust law enforcement is somehow immune to the political pressures that impinge on other government regulatory agencies. Microsoft's protracted encounter with the antitrust authorities should help to dispel that naive point of view. The creative energies of one of America's leading entrepreneurs have increasingly been diverted from the business of developing and marketing computer-related products in order to respond to opponents who have yet to articulate a coherent theory of consumer injury that does not rely fundamentally on a highly implausible scenario in which, unless its brutally competitive practices are now checked, Microsoft will someday stand unchallenged as the world's only supplier of computer operating systems and software applications and it will then raise prices to monopoly levels.⁴⁶

Antitrust's supporters deny that it is simply another form of regulation.⁴⁷ Recent press reports suggest, however, that although the Justice Department continues to build a broader antitrust case against Microsoft, the authorities are apparently prepared to allow Windows 98 to be sold with a fully integrated version of Internet Explorer, provided that another version of the operating system, one that does not include Web-browsing software, is also made available (Wilke 1998). That proposal has been hailed by former antitrust official Carl Shapiro as a useful compromise that preserves computer manufacturers' freedom to install Netscape's rival Web browser if they so choose but does not unduly interfere with Microsoft's product development strategies. But it is hard to see how coercing a firm to offer two versions of its core product,

44. Assistant Attorney General for Antitrust Joel Klein (1998a, 11) opines that "the natural state of markets is not to move towards increasing competition." Without antitrust, he warns, "the competitive structure of our economy would erode significantly."

45. For example, the authors of a study of a large sample of mergers challenged by the government under section 7 of the Clayton Act concluded, "Our results do not support the contention that enforcement of Section 7 has served the public interest. While it is possible that the government's merger policy has deterred some anticompetitive mergers, the results indicate that it has also protected rival producers from facing increased competition due to efficient mergers" (Eckbo and Wier 1985, 121). Additional evidence of antitrust's failure to produce benefits for consumers is contained in Armentano (1990) and McChesney and Shughart (1995).

46. Bork (1998), for example, thinks that "Microsoft's disproportionate resources and the fact that costs do not rise commensurately with output . . . make predation a feasible tactic." But if network externalities work in reverse and if capital continues to flow to its most valued uses, then predation makes no more sense in the computer industry than it did a century ago in the oil industry. See McGee 1958 for evidence that Standard Oil never engaged in predatory pricing.

47. The American Enterprise Institute's Irwin Steltzer, for example, says that his "friends at conservative think tanks think the antitrust laws are just another form of regulation. They are not. They are the biggest bulwark we have against the spread of regulation by government" (Murray 1998).

one of which will lack what it considers an important feature, is anything other than heavy-handed government regulation operating in disguise.

Netscape will have secured an important competitive advantage if Microsoft is again forced to accede to Justice Department demands. But a victory for Netscape is not the same thing as a victory for consumers. Netscape, it should be remembered, once dominated the market for Web browsers, a position it achieved in part by giving its product away in order to induce consumers to switch from existing first-generation Internet-exploring software. By using a similar strategy, Microsoft made substantial inroads into Netscape's market share. Competition is supposed to work in this fashion: firms "injure" their rivals, but consumers gain. Market forces then demanded a counterresponse by Netscape, which, by adding more features to its product, lowering its price, or both, could strive to expand its customer base and regain business lost to an aggressive competitor. Instead, Netscape chose to complain to the antitrust authorities, hoping that they would intervene to provide protection from the rough-and-tumble of the competitive marketplace. But such protection does not preserve competition. Rather, it comes at competition's expense.

Microsoft's competitors have so far succeeded in imposing millions of dollars of costs on the firm, both directly (in the form of legal fees and the expenses associated with marketing two versions of the Windows operating system) and indirectly (in the form of the value of the productive time its managers and other employees have sacrificed in dealing with antitrust issues). Costs such as these will by all accounts continue to be borne by Microsoft for months—perhaps years—to come. Given the reasonable doubts about the theoretical underpinnings of the antitrust war now being waged, including whether or not Microsoft is even a "monopolist" deserving condemnation, consumers and taxpayers might well wonder what exactly to expect in return.

Conclusion

A monopolist is definitely the only seller of a product, and a firm with a dominant position in an identified market may be a monopolist. However, contrary to claims by the Justice Department's lawyers and software market critics, a dominant producer—or even a single seller—is not necessarily a monopolist.

A monopolist is a firm that can, to a significant degree, exploit its market position by restricting output and raising price to generate profits in excess of those expected in a competitive market environment. Although Microsoft surely has some market power, as do many other firms in the computer industry, its market pricing and product development strategies do not square with those of a monopolist. Far from restricting output, Microsoft has expanded it. Rather than hiking the price of the Windows operating system, the firm has lowered its price and enhanced its power and usefulness. Microsoft proposes to increase long-run profits by adding value to Windows by integrating its Web browser into the operating system. If the firm is not adding value to its products,

a number of other computer firms are in a position to erode its market share. As we have shown, claims that Microsoft can control the software market because of that market's alleged special attributes—network externalities, path dependency, and essential facilities—have not been carefully considered. Such claims are weak because the underlying arguments have serious flaws.

Microsoft's critics come far closer to the mark when they complain that Microsoft has been "brutally competitive" than when they claim Microsoft is a "monopoly." From our perspective, it appears that once again the Justice Department is using the antitrust laws to thwart competition by a highly successful American firm. To protect unsuccessful competitors, it is squelching competition.

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